Simulation Result For Two-Level Intercept Model

Shafayet Khan Shafee

19 August 2023

Histograms for $log(\widehat{MOR})$ When Number of Cluster is 10
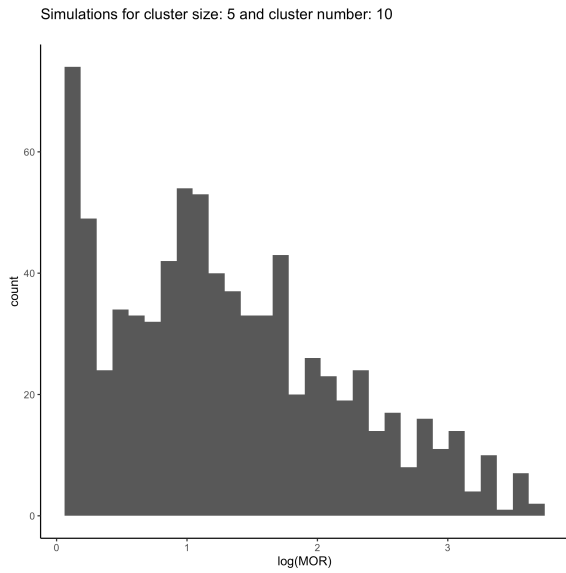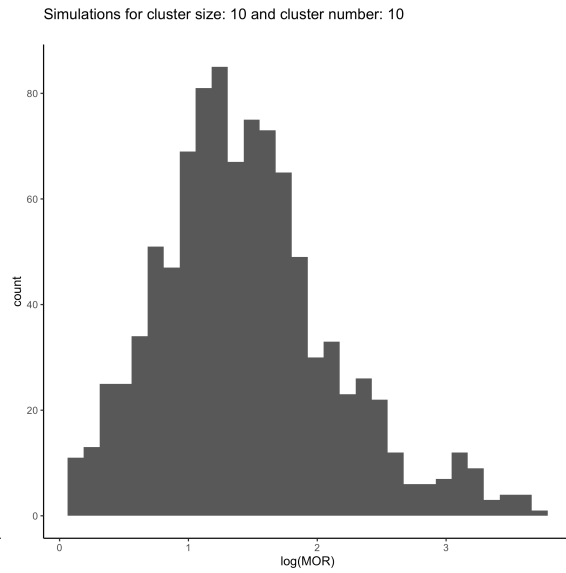
Simulations for cluster size: 5 and cluster number: 10

Figure 1: For cluster size 5

Simulations for cluster size: 10 and cluster number: 10

Figure 2: For cluster size 10

Simulations for cluster size: 30 and cluster number: 10

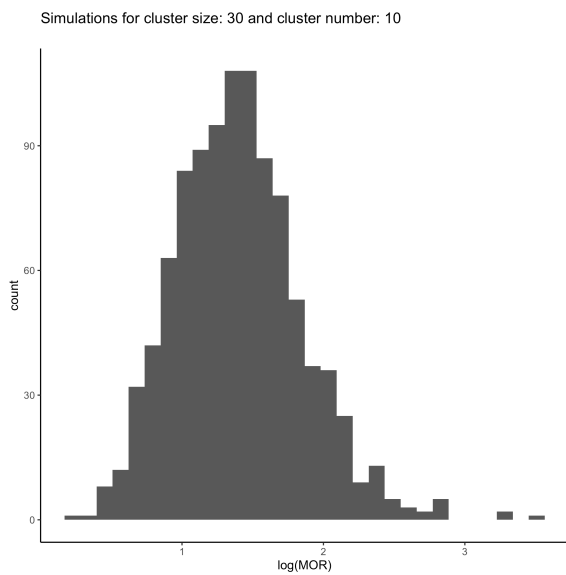Figure 3: For cluster size 30
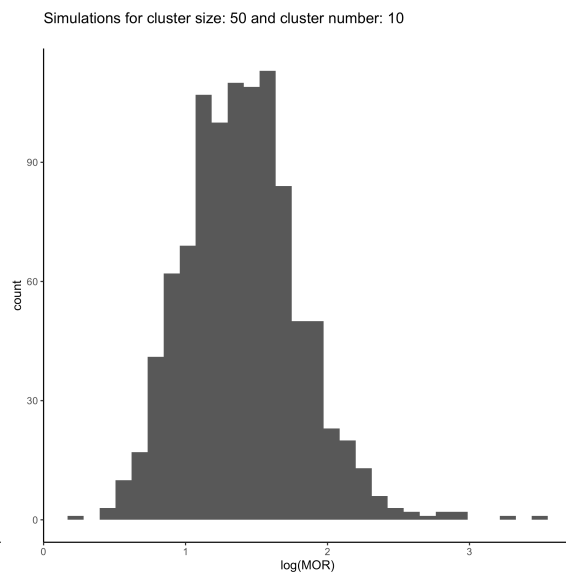
Simulations for cluster size: 50 and cluster number: 10

Figure 4: For cluster size 50

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

Simulations for cluster size: 5 and cluster number: 30

Figure 5: For cluster size 5

Simulations for cluster size: 10 and cluster number: 30

Figure 6: For cluster size 10

Simulations for cluster size: 30 and cluster number: 30

Figure 7: For cluster size 30

Simulations for cluster size: 50 and cluster number: 30

Figure 8: For cluster size 50

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

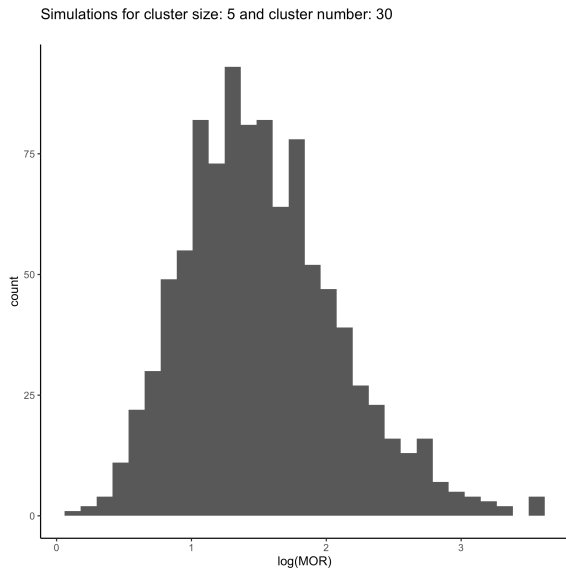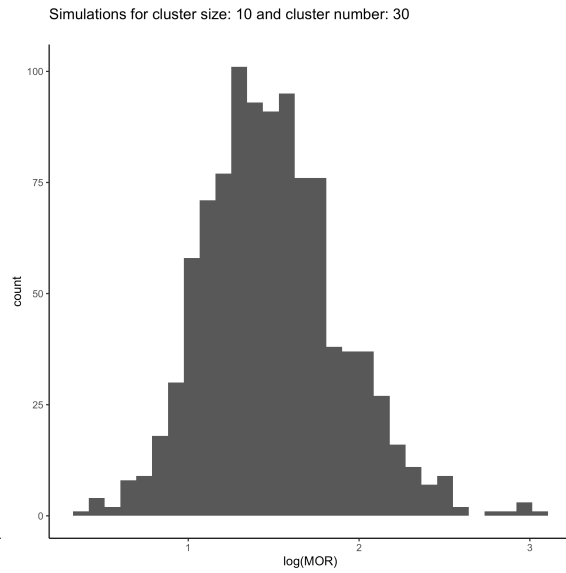Simulations for cluster size: 5 and cluster number: 50

Simulations for cluster size: 10 and cluster number: 50

Figure 9: For cluster size 5

Figure 10: For cluster size 10

Simulations for cluster size: 30 and cluster number: 50

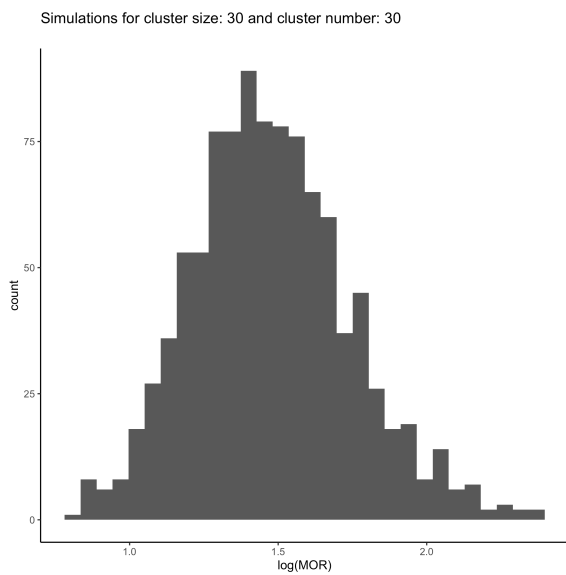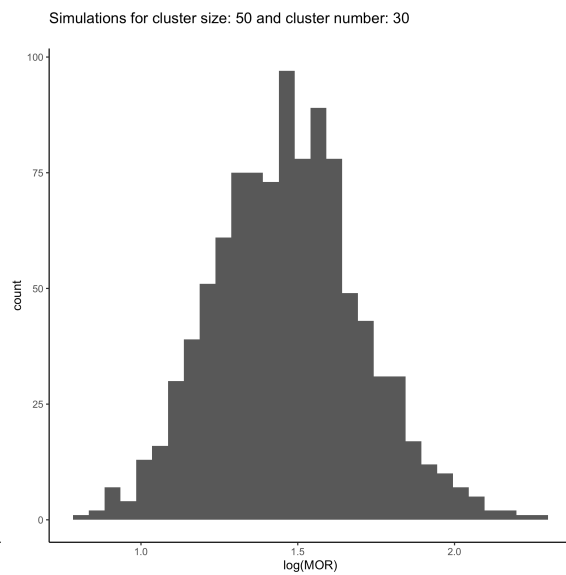Simulations for cluster size: 50 and cluster number: 50

Figure 11: For cluster size 30

Figure 12: For cluster size 50

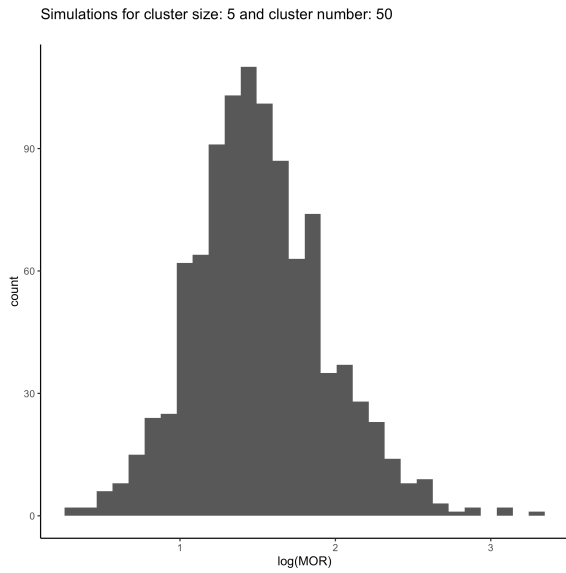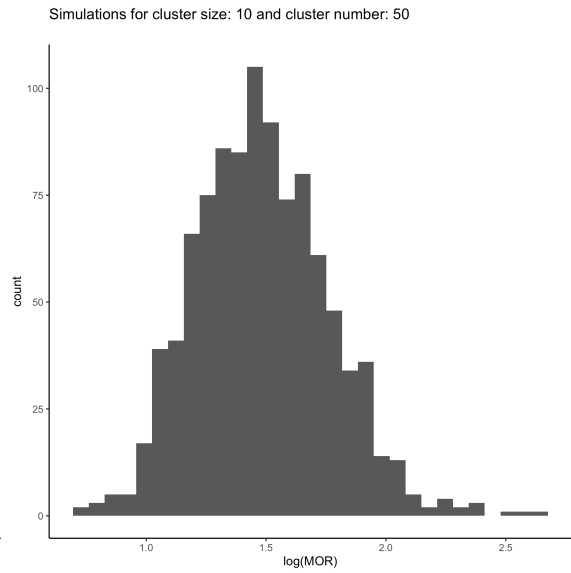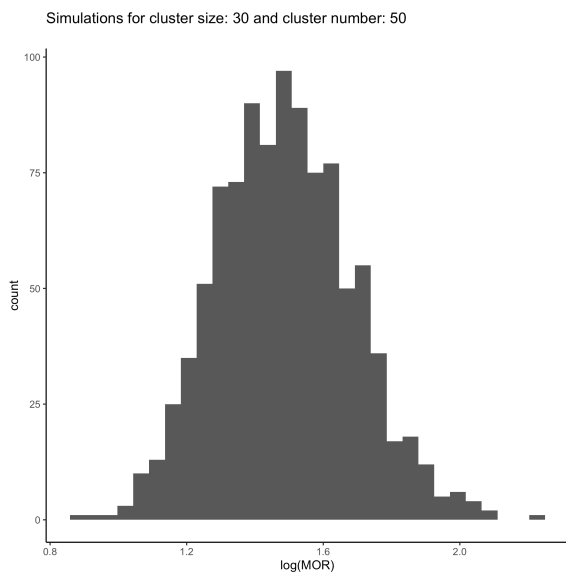# Histograms for $log(\widehat{MOR})$ When Number of Cluster is 100

Simulations for cluster size: 5 and cluster number: 100

Simulations for cluster size: 10 and cluster number: 100

Figure 13: For cluster size 5

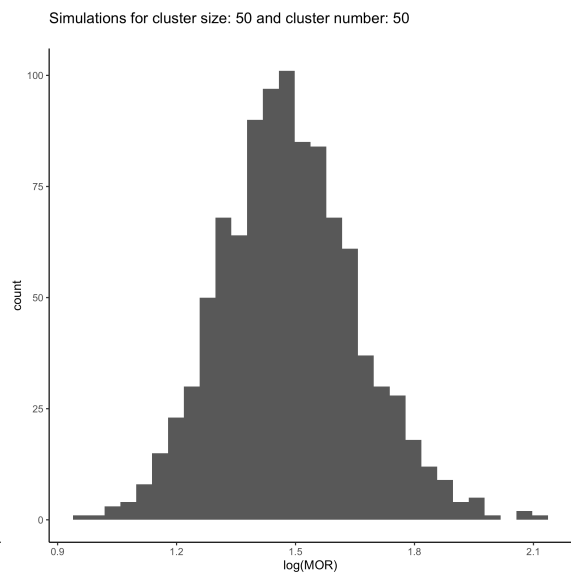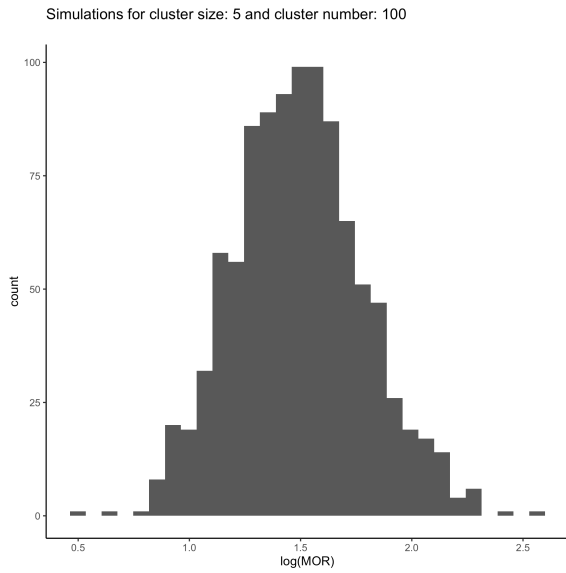Figure 14: For cluster size 10

Simulations for cluster size: 30 and cluster number: 100
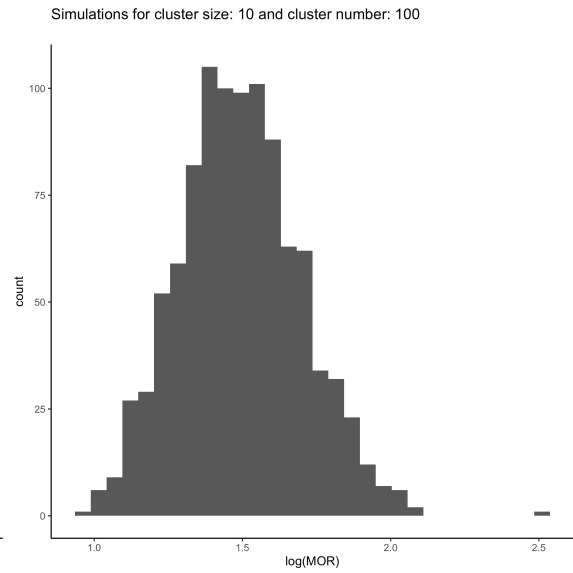
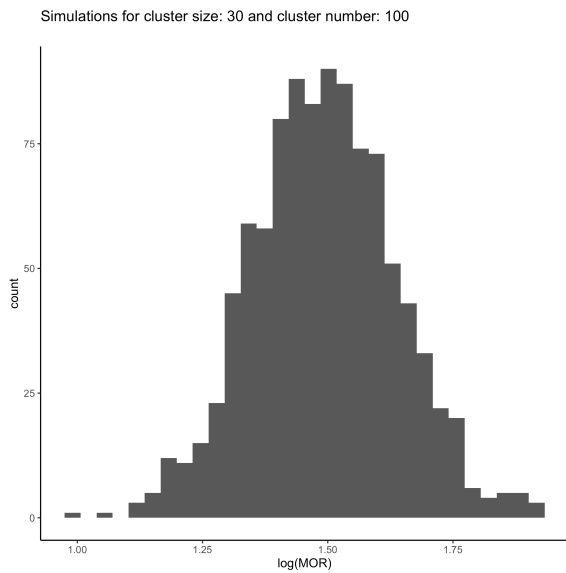Simulations for cluster size: 50 and cluster number: 100
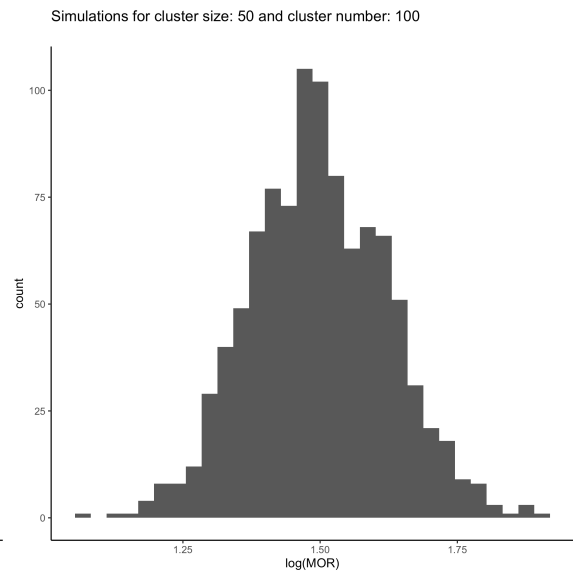
Figure 15: For cluster size 30

Figure 16: For cluster size 50

Simulation Result Table

Number of Cluster	Cluster Size	$\widehat{\beta_0}$	$\widehat{\beta_1}$	$\widehat{\beta_2}$	$\widehat{\sigma_u^2}$	$\widehat{MOR}$	$\hat{\sigma}_{MOR}$	Simulation $\hat{\sigma}_{MOR}$	CI coverage (95%)	Relative Bias (%)	Runs used
10	5	2.19	2.04	0.75	2.74	5.69	3.24	2.39	0.91	25.81	797
10	10	2.17	1.90	0.79	2.83	5.58	2.09	1.97	0.96	23.51	968
10	30	2.04	1.79	0.71	2.37	4.52	1.55	1.56	0.88	0.13	999
10	50	2.01	1.76	0.66	2.35	4.45	1.48	1.50	0.86	-1.41	1000
30	5	2.09	1.86	0.76	2.92	5.53	1.80	1.77	0.97	22.35	985
30	10	2.05	1.79	0.70	2.63	4.85	1.45	1.49	0.93	7.26	1000
30	30	2.01	1.76	0.68	2.47	4.54	1.29	1.30	0.92	0.50	1000
30	50	2.01	1.76	0.67	2.43	4.47	1.26	1.26	0.92	-1.18	1000
50	5	2.07	1.82	0.70	2.72	5.01	1.53	1.54	0.96	10.82	1000
50	10	2.01	1.77	0.69	2.51	4.59	1.32	1.32	0.94	1.64	1000
50	30	2.00	1.76	0.68	2.48	4.52	1.22	1.22	0.94	-0.06	1000
50	50	1.99	1.75	0.67	2.45	4.47	1.20	1.19	0.94	-0.99	1000
100	5	2.01	1.77	0.68	2.54	4.64	1.33	1.34	0.94	2.76	1000
100	10	2.00	1.76	0.67	2.50	4.55	1.22	1.23	0.93	0.59	1000
100	30	2.00	1.75	0.68	2.47	4.49	1.15	1.15	0.93	-0.54	1000
100	50	1.99	1.75	0.67	2.48	4.51	1.14	1.13	0.95	-0.30	1000

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.