APPENDIX F

Comparison of results for data from the Lognormal distribution

Following the Monte Carlo simulation, the bias, standardised median absolute deviation (S_{MAD}) and root median square error (RMSE) of B-lives for the Weibull and Lognormal models can be calculated. Tables F.1 to F.10 show the Bias/(True value), S_{MAD}/(True value) and RMSE/(True value) of the chosen B-lives (i.e. B-1, B-0.1, B-0.01, B-0.001 and B-0.0001 lives) for complete and censored data (10%(20%)70%) from the Lognormal θ = 10,000 and various ρ (0.4, 0.8, 2.5 and 4) and sample sizes (10, 25, 50 and 100) for the Weibull and Lognormal models using the MRR and MLE methods. In each case, in these tables, a coloured entry indicates the more accurate value, (light red for Bias/(True value), blue for S_{MAD}/(True value) and green for RMSE/(True value)).

Taking bias as the criterion, the Lognormal model is more accurate than the Weibull model for most cases. Tables F.1 and F.2 show light red values (the lesser bias) for all except a few values of B-life, when ρ = 0.4 and the MLE method is used. In all cases the Weibull model underestimates (negative signs) the B-lives whereas the Lognormal model variously underestimates or overestimates the B-lives. We can therefore conclude that the Weibull model

is more conservative than the Lognormal model resulting in generally underestimating Weibull B-lives.

When the data is from the Lognormal distribution, using the Weibull model to estimate the chosen B-lives is always safer than using the Lognormal model. Bias/True values in Tables F.1 to F.10 are always negative and always greater in the negative sense than the Bias/True values for Lognormal. The RMSE/True values are usually better for the Lognormal than for the Weibull and for $\rho = 2.5$ and $\rho = 4$ this is true for all the cases investigated (see green values of RMSE/True in Table F.1 and F.2). All the above are conclusions about complete data. The position regarding censored data (10%, 30%, 50% and 70% censored) is more variable and requires individual study of Tables F.3 to F.10. The Weibull Bias/True and S_{MAD}/True values are generally small resulting in small values of RMSE/True. So not only does the Weibull give smaller errors arising from its use, the Weibull also produces more pessimistic (safer) estimates of B-lives than the Lognormal. This is an advantage for industrial and commercial applications of reliability for safety reasons. What if we choose the wrong model? For example, what happens if data is really from the Lognormal distribution and we erroneously use the Weibull model to estimate B-0.1 life? Estimation errors would result, but they would not be as serious as if we had erroneously used the Lognormal model for Weibull data. We can see this by comparing the results for $\rho \leq 1$ cases, in Appendix E. Further, for some cases (complete and censored) such as $\rho = 0.4$ and $n = 10$,

the RMSE/True values of the Weibull are smaller than those of the Lognormal even when applied to Lognormal data.

Appendix F **Comparison of results for data from the Lognormal distribution**

Table F.1 B-life estimations from the Lognormal data using the Weibull and Lognormal models (MRR)

ρ=0.4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	29.799	-0.924	0.107	0.930	-0.052	1.211	1.212
B-0.1	4.414	-0.995	0.007	0.995	-0.105	1.242	1.246
B-0.01	0.915	-1.000	3E-04	1.000	-0.140	1.237	1.245
B-0.001	0.234	-1.000	1E-05	1.000	-0.180	1.198	1.211
B-0.0001	0.066	-1.000	3E-07	1.000	-0.204	1.171	1.189
n=25							
B-1	29.799	-0.898	0.113	0.906	-0.115	0.835	0.842
B-0.1	4.414	-0.993	0.009	0.993	-0.131	0.948	0.957
B-0.01	0.915	-1.000	5E-04	1.000	-0.134	1.037	1.045
B-0.001	0.234	-1.000	2E-05	1.000	-0.161	1.069	1.081
B-0.0001	0.066	-1.000	7E-07	1.000	-0.162	1.116	1.127
n=50							
B-1	29.799	-0.882	0.097	0.887	-0.066	0.610	0.613
B-0.1	4.414	-0.991	0.009	0.992	-0.095	0.725	0.731
B-0.01	0.915	-1.000	0.001	1.000	-0.106	0.810	0.817
B-0.001	0.234	-1.000	3E-05	1.000	-0.105	0.888	0.894
B-0.0001	0.066	-1.000	1E-06	1.000	-0.129	0.926	0.935
n=100							
B-1	29.799	-0.864	0.077	0.867	-0.021	0.455	0.455
B-0.1	4.414	-0.989	0.009	0.989	-0.012	0.568	0.569
B-0.01	0.915	-0.999	0.001	0.999	-0.002	0.660	0.660
B-0.001	0.234	-1.000	3E-05	1.000	-0.002	0.734	0.734
B-0.0001	0.066	-1.000	1E-06	1.000	-0.003	0.795	0.795

Table F.2 B-life estimations from the Lognormal data using the Weibull and Lognormal models (MLE)

ρ=0.4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	29.799	-0.934	0.096	0.939	0.727	2.074	2.198
B-0.1	4.414	-0.996	0.006	0.996	1.050	2.771	2.963
B-0.01	0.915	-1.000	2E-04	1.000	1.375	3.341	3.613
B-0.001	0.234	-1.000	7E-06	1.000	1.687	3.864	4.217
B-0.0001	0.066	-1.000	2E-07	1.000	1.949	4.294	4.716
n=25							
B-1	29.799	-0.972	0.036	0.973	0.278	1.126	1.160
B-0.1	4.414	-0.999	1E-03	0.999	0.374	1.392	1.442
B-0.01	0.915	-1.000	3E-05	1.000	0.399	1.578	1.627
B-0.001	0.234	-1.000	6E-07	1.000	0.482	1.789	1.853
B-0.0001	0.066	-1.000	9E-09	1.000	0.524	1.927	1.997
n=50							
B-1	29.799	-0.979	0.021	0.980	0.124	0.670	0.681
B-0.1	4.414	-0.999	0.001	0.999	0.156	0.819	0.834
B-0.01	0.915	-1.000	2E-05	1.000	0.185	0.962	0.980
B-0.001	0.234	-1.000	3E-07	1.000	0.227	1.104	1.127
B-0.0001	0.066	-1.000	4E-09	1.000	0.269	1.239	1.268
n=100							
B-1	29.799	-0.984	0.014	0.984	0.053	0.490	0.492
B-0.1	4.414	-1.000	4E-04	1.000	0.072	0.607	0.611
B-0.01	0.915	-1.000	9E-06	1.000	0.097	0.714	0.720
B-0.001	0.234	-1.000	1E-07	1.000	0.120	0.796	0.805
B-0.0001	0.066	-1.000	2E-09	1.000	0.133	0.877	0.887

Table F.1 (continued) B-life estimations from the Lognormal data using the Weibull and Lognormal models (MRR)

ρ=0.8		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	545.888	-0.743	0.252	0.784	-0.104	0.679	0.687
B-0.1	210.090	-0.937	0.079	0.941	-0.106	0.815	0.822
B-0.01	95.679	-0.987	0.018	0.987	-0.111	0.897	0.904
B-0.001	48.353	-0.998	0.004	0.998	-0.111	0.972	0.978
B-0.0001	25.787	-1.000	0.001	1.000	-0.115	1.035	1.041
n=25							
B-1	545.888	-0.674	0.216	0.708	-0.028	0.499	0.500
B-0.1	210.090	-0.913	0.080	0.916	-0.027	0.607	0.607
B-0.01	95.679	-0.981	0.021	0.981	-0.024	0.709	0.710
B-0.001	48.353	-0.996	0.005	0.996	-0.021	0.789	0.790
B-0.0001	25.787	-0.999	0.001	0.999	-0.030	0.848	0.849
n=50							
B-1	545.888	-0.653	0.153	0.671	-0.023	0.333	0.333
B-0.1	210.090	-0.906	0.060	0.908	-0.035	0.414	0.416
B-0.01	95.679	-0.978	0.018	0.979	-0.037	0.477	0.478
B-0.001	48.353	-0.996	0.004	0.996	-0.042	0.531	0.532
B-0.0001	25.787	-0.999	0.001	0.999	-0.043	0.579	0.580
n=100							
B-1	545.888	-0.630	0.113	0.640	-0.011	0.243	0.243
B-0.1	210.090	-0.898	0.047	0.899	-0.011	0.300	0.300
B-0.01	95.679	-0.976	0.015	0.976	-0.011	0.345	0.345
B-0.001	48.353	-0.995	0.004	0.995	-0.010	0.397	0.397
B-0.0001	25.787	-0.999	0.001	0.999	-0.011	0.435	0.435

Table F.2 (continued) B-life estimations from the Lognormal data using the Weibull and Lognormal models (MLE)

ρ=0.8		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	545.888	-0.751	0.262	0.796	0.265	0.837	0.878
B-0.1	210.090	-0.943	0.074	0.946	0.363	1.121	1.178
B-0.01	95.679	-0.989	0.015	0.989	0.468	1.378	1.455
B-0.001	48.353	-0.998	0.003	0.998	0.566	1.597	1.694
B-0.0001	25.787	-1.000	4E-04	1.000	0.638	1.780	1.891
n=25							
B-1	545.888	-0.831	0.142	0.843	0.098	0.510	0.520
B-0.1	210.090	-0.968	0.036	0.969	0.119	0.622	0.633
B-0.01	95.679	-0.995	0.007	0.995	0.157	0.751	0.768
B-0.001	48.353	-0.999	0.001	0.999	0.181	0.861	0.880
B-0.0001	25.787	-1.000	1E-04	1.000	0.204	0.951	0.972
n=50							
B-1	545.888	-0.857	0.094	0.862	0.042	0.359	0.361
B-0.1	210.090	-0.976	0.023	0.976	0.052	0.445	0.448
B-0.01	95.679	-0.997	0.004	0.997	0.080	0.521	0.527
B-0.001	48.353	-1.000	0.001	1.000	0.094	0.591	0.599
B-0.0001	25.787	-1.000	7E-05	1.000	0.103	0.661	0.669
n=100							
B-1	545.888	-0.875	0.059	0.877	0.011	0.236	0.236
B-0.1	210.090	-0.981	0.013	0.981	0.021	0.300	0.301
B-0.01	95.679	-0.997	0.002	0.997	0.025	0.344	0.345
B-0.001	48.353	-1.000	3E-04	1.000	0.030	0.387	0.388
B-0.0001	25.787	-1.000	4E-05	1.000	0.035	0.424	0.425

Table F.1 (continued) B-life estimations from the Lognormal data using the Weibull and Lognormal models (MRR)

ρ=2.5		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	3943.420	-0.343	0.231	0.414	-0.023	0.255	0.256
B-0.1	2905.156	-0.583	0.220	0.623	-0.020	0.321	0.321
B-0.01	2258.718	-0.749	0.175	0.769	-0.023	0.375	0.375
B-0.001	1815.575	-0.854	0.124	0.863	-0.029	0.419	0.420
B-0.0001	1484.735	-0.917	0.081	0.921	-0.027	0.461	0.462
n=25							
B-1	3943.420	-0.299	0.140	0.330	-0.010	0.150	0.151
B-0.1	2905.156	-0.539	0.136	0.556	-0.006	0.189	0.189
B-0.01	2258.718	-0.713	0.112	0.722	-0.005	0.222	0.222
B-0.001	1815.575	-0.827	0.084	0.831	-0.005	0.250	0.250
B-0.0001	1484.735	-0.898	0.059	0.899	-0.004	0.277	0.277
n=50							
B-1	3943.420	-0.292	0.105	0.310	-0.013	0.111	0.112
B-0.1	2905.156	-0.536	0.101	0.545	-0.011	0.143	0.143
B-0.01	2258.718	-0.711	0.085	0.716	-0.013	0.169	0.170
B-0.001	1815.575	-0.826	0.064	0.829	-0.016	0.190	0.191
B-0.0001	1484.735	-0.897	0.045	0.898	-0.018	0.207	0.207
n=100							
B-1	3943.420	-0.275	0.073	0.284	-0.006	0.081	0.081
B-0.1	2905.156	-0.518	0.070	0.522	-0.007	0.100	0.101
B-0.01	2258.718	-0.697	0.060	0.699	-0.007	0.115	0.116
B-0.001	1815.575	-0.816	0.045	0.817	-0.008	0.130	0.130
B-0.0001	1484.735	-0.890	0.032	0.891	-0.009	0.143	0.143

Table F.2 (continued) B-life estimations from the Lognormal data using the Weibull and Lognormal models (MLE)

ρ=2.5		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	3943.420	-0.353	0.283	0.453	0.075	0.275	0.285
B-0.1	2905.156	-0.593	0.258	0.646	0.105	0.357	0.372
B-0.01	2258.718	-0.756	0.201	0.782	0.123	0.424	0.441
B-0.001	1815.575	-0.859	0.139	0.870	0.151	0.489	0.512
B-0.0001	1484.735	-0.921	0.089	0.925	0.185	0.557	0.587
n=25							
B-1	3943.420	-0.437	0.162	0.466	0.018	0.156	0.157
B-0.1	2905.156	-0.670	0.138	0.684	0.031	0.198	0.201
B-0.01	2258.718	-0.817	0.101	0.823	0.039	0.229	0.233
B-0.001	1815.575	-0.902	0.067	0.904	0.046	0.262	0.266
B-0.0001	1484.735	-0.948	0.041	0.949	0.055	0.290	0.295
n=50							
B-1	3943.420	-0.464	0.113	0.478	0.017	0.109	0.110
B-0.1	2905.156	-0.698	0.095	0.704	0.024	0.134	0.136
B-0.01	2258.718	-0.837	0.069	0.840	0.027	0.155	0.158
B-0.001	1815.575	-0.916	0.045	0.917	0.030	0.175	0.177
B-0.0001	1484.735	-0.957	0.027	0.958	0.035	0.196	0.199
n=100							
B-1	3943.420	-0.486	0.084	0.493	0.006	0.078	0.078
B-0.1	2905.156	-0.717	0.071	0.720	0.010	0.095	0.096
B-0.01	2258.718	-0.851	0.050	0.853	0.013	0.115	0.116
B-0.001	1815.575	-0.925	0.032	0.925	0.017	0.131	0.132
B-0.0001	1484.735	-0.963	0.019	0.963	0.018	0.145	0.146

Table F.1 (continued) B-life estimations from the Lognormal data using the Weibull and Lognormal models (MRR)

ρ=4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	5590.114	-0.225	0.162	0.277	-0.011	0.148	0.148
B-0.1	4618.287	-0.414	0.182	0.452	-0.014	0.189	0.190
B-0.01	3946.060	-0.573	0.175	0.599	-0.015	0.227	0.227
B-0.001	3442.578	-0.695	0.158	0.713	-0.015	0.254	0.254
B-0.0001	3035.852	-0.785	0.133	0.796	-0.014	0.282	0.283
n=25							
B-1	5590.114	-0.205	0.098	0.228	-0.011	0.098	0.099
B-0.1	4618.287	-0.397	0.113	0.413	-0.013	0.120	0.121
B-0.01	3946.060	-0.555	0.110	0.565	-0.016	0.139	0.140
B-0.001	3442.578	-0.679	0.101	0.687	-0.018	0.156	0.157
B-0.0001	3035.852	-0.770	0.087	0.775	-0.020	0.173	0.174
n=50							
B-1	5590.114	-0.192	0.070	0.205	-0.006	0.068	0.068
B-0.1	4618.287	-0.380	0.081	0.389	-0.008	0.085	0.085
B-0.01	3946.060	-0.539	0.080	0.545	-0.010	0.098	0.099
B-0.001	3442.578	-0.664	0.074	0.668	-0.012	0.111	0.112
B-0.0001	3035.852	-0.756	0.064	0.759	-0.013	0.121	0.122
n=100							
B-1	5590.114	-0.186	0.052	0.193	-0.007	0.049	0.050
B-0.1	4618.287	-0.372	0.058	0.377	-0.010	0.061	0.061
B-0.01	3946.060	-0.531	0.058	0.534	-0.013	0.072	0.073
B-0.001	3442.578	-0.657	0.053	0.659	-0.014	0.081	0.082
B-0.0001	3035.852	-0.752	0.046	0.754	-0.014	0.090	0.091

Table F.2 (continued) B-life estimations from the Lognormal data using the Weibull and Lognormal models (MLE)

ρ=4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	5590.114	-0.229	0.203	0.306	0.051	0.163	0.171
B-0.1	4618.287	-0.420	0.223	0.475	0.063	0.202	0.211
B-0.01	3946.060	-0.579	0.217	0.618	0.083	0.239	0.253
B-0.001	3442.578	-0.704	0.189	0.729	0.098	0.276	0.293
B-0.0001	3035.852	-0.793	0.155	0.808	0.110	0.306	0.325
n=25							
B-1	5590.114	-0.300	0.132	0.328	0.020	0.097	0.099
B-0.1	4618.287	-0.500	0.141	0.519	0.026	0.124	0.127
B-0.01	3946.060	-0.654	0.132	0.667	0.031	0.147	0.150
B-0.001	3442.578	-0.767	0.111	0.775	0.035	0.168	0.171
B-0.0001	3035.852	-0.844	0.088	0.849	0.039	0.184	0.188
n=50							
B-1	5590.114	-0.323	0.093	0.336	0.012	0.070	0.071
B-0.1	4618.287	-0.526	0.097	0.535	0.016	0.090	0.091
B-0.01	3946.060	-0.679	0.089	0.685	0.017	0.105	0.106
B-0.001	3442.578	-0.787	0.075	0.791	0.019	0.118	0.120
B-0.0001	3035.852	-0.860	0.059	0.862	0.022	0.131	0.132
n=100							
B-1	5590.114	-0.335	0.068	0.342	0.008	0.049	0.049
B-0.1	4618.287	-0.540	0.072	0.545	0.012	0.061	0.062
B-0.01	3946.060	-0.692	0.064	0.695	0.015	0.070	0.071
B-0.001	3442.578	-0.798	0.053	0.800	0.017	0.079	0.081
B-0.0001	3035.852	-0.869	0.041	0.870	0.019	0.088	0.090

Appendix F **Comparison of results for data from the Lognormal distribution**

Table F.3 B-life estimations from the Lognormal data (including 10% censoring) using the Weibull and Lognormal models (MRR)

ρ=0.4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	29.799	-0.915	0.120	0.923	-0.036	1.228	1.228
B-0.1	4.414	-0.995	0.007	0.995	-0.113	1.233	1.238
B-0.01	0.915	-1.000	3E-04	1.000	-0.171	1.191	1.203
B-0.001	0.234	-1.000	9E-06	1.000	-0.237	1.114	1.139
B-0.0001	0.066	-1.000	2E-07	1.000	-0.287	1.050	1.089
n=25							
B-1	29.799	-0.883	0.124	0.892	-0.028	0.877	0.877
B-0.1	4.414	-0.992	0.010	0.992	-0.070	0.987	0.989
B-0.01	0.915	-1.000	0.001	1.000	-0.131	1.041	1.050
B-0.001	0.234	-1.000	2E-05	1.000	-0.163	1.072	1.084
B-0.0001	0.066	-1.000	7E-07	1.000	-0.178	1.094	1.108
n=50							
B-1	29.799	-0.845	0.130	0.855	0.043	0.726	0.727
B-0.1	4.414	-0.988	0.013	0.988	-0.009	0.860	0.860
B-0.01	0.915	-0.999	0.001	0.999	-0.070	0.910	0.913
B-0.001	0.234	-1.000	4E-05	1.000	-0.118	0.953	0.960
B-0.0001	0.066	-1.000	2E-06	1.000	-0.151	0.975	0.986
n=100							
B-1	29.799	-0.833	0.099	0.838	0.047	0.489	0.491
B-0.1	4.414	-0.987	0.011	0.987	-0.024	0.569	0.570
B-0.01	0.915	-0.999	0.001	0.999	-0.072	0.631	0.636
B-0.001	0.234	-1.000	4E-05	1.000	-0.121	0.665	0.676
B-0.0001	0.066	-1.000	2E-06	1.000	-0.159	0.689	0.708

Table F.4 B-life estimations from the Lognormal data (including 10% censoring) using the Weibull and Lognormal models (MLE)

ρ=0.4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	29.799	-0.905	0.137	0.915	0.954	2.327	2.515
B-0.1	4.414	-0.994	0.009	0.994	1.166	2.849	3.078
B-0.01	0.915	-1.000	3E-04	1.000	1.503	3.485	3.795
B-0.001	0.234	-1.000	1E-05	1.000	1.839	4.078	4.474
B-0.0001	0.066	-1.000	3E-07	1.000	2.124	4.557	5.028
n=25							
B-1	29.799	-0.967	0.044	0.968	0.330	1.148	1.194
B-0.1	4.414	-0.999	0.002	0.999	0.362	1.384	1.430
B-0.01	0.915	-1.000	3E-05	1.000	0.394	1.598	1.646
B-0.001	0.234	-1.000	7E-07	1.000	0.409	1.735	1.783
B-0.0001	0.066	-1.000	1E-08	1.000	0.426	1.848	1.897
n=50							
B-1	29.799	-0.974	0.030	0.975	0.161	0.770	0.787
B-0.1	4.414	-0.999	0.001	0.999	0.112	0.905	0.912
B-0.01	0.915	-1.000	2E-05	1.000	0.060	0.965	0.967
B-0.001	0.234	-1.000	3E-07	1.000	0.010	1.022	1.022
B-0.0001	0.066	-1.000	5E-09	1.000	-0.006	1.086	1.086
n=100							
B-1	29.799	-0.979	0.019	0.979	0.135	0.560	0.576
B-0.1	4.414	-0.999	0.001	0.999	0.092	0.647	0.654
B-0.01	0.915	-1.000	1E-05	1.000	0.074	0.743	0.747
B-0.001	0.234	-1.000	2E-07	1.000	0.033	0.788	0.789
B-0.0001	0.066	-1.000	3E-09	1.000	0.008	0.835	0.835

Table F.3 (continued) B-life estimations from the Lognormal data (including 10% censoring) using the Weibull and Lognormal models (MRR)

ρ=0.8		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	545.888	-0.685	0.318	0.755	0.032	0.816	0.816
B-0.1	210.090	-0.920	0.103	0.926	-0.010	0.966	0.966
B-0.01	95.679	-0.983	0.024	0.983	-0.046	1.048	1.049
B-0.001	48.353	-0.997	0.005	0.997	-0.050	1.133	1.134
B-0.0001	25.787	-0.999	0.001	0.999	-0.040	1.193	1.194
n=25							
B-1	545.888	-0.655	0.227	0.693	-0.014	0.516	0.517
B-0.1	210.090	-0.909	0.084	0.913	-0.049	0.625	0.627
B-0.01	95.679	-0.980	0.023	0.980	-0.060	0.693	0.695
B-0.001	48.353	-0.996	0.005	0.996	-0.083	0.756	0.761
B-0.0001	25.787	-0.999	0.001	0.999	-0.096	0.810	0.816
n=50							
B-1	545.888	-0.623	0.172	0.646	-0.001	0.359	0.359
B-0.1	210.090	-0.899	0.067	0.901	-0.049	0.423	0.425
B-0.01	95.679	-0.977	0.020	0.977	-0.080	0.486	0.492
B-0.001	48.353	-0.995	0.005	0.995	-0.101	0.532	0.541
B-0.0001	25.787	-0.999	0.001	0.999	-0.119	0.578	0.590
n=100							
B-1	545.888	-0.611	0.112	0.621	-0.012	0.243	0.243
B-0.1	210.090	-0.895	0.045	0.896	-0.052	0.284	0.289
B-0.01	95.679	-0.976	0.014	0.976	-0.081	0.323	0.333
B-0.001	48.353	-0.995	0.004	0.995	-0.109	0.353	0.370
B-0.0001	25.787	-0.999	0.001	0.999	-0.128	0.383	0.404

Table F.4 (continued) B-life estimations from the Lognormal data (including 10% censoring) using the Weibull and Lognormal models (MLE)

ρ=0.8		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	545.888	-0.718	0.307	0.781	0.265	0.941	0.978
B-0.1	210.090	-0.937	0.085	0.940	0.295	1.150	1.187
B-0.01	95.679	-0.988	0.018	0.988	0.348	1.351	1.395
B-0.001	48.353	-0.998	0.003	0.998	0.396	1.529	1.579
B-0.0001	25.787	-1.000	0.001	1.000	0.481	1.703	1.770
n=25							
B-1	545.888	-0.819	0.145	0.832	0.109	0.522	0.533
B-0.1	210.090	-0.967	0.037	0.968	0.116	0.655	0.665
B-0.01	95.679	-0.995	0.007	0.995	0.125	0.760	0.770
B-0.001	48.353	-0.999	0.001	0.999	0.141	0.849	0.860
B-0.0001	25.787	-1.000	1E-04	1.000	0.124	0.914	0.922
n=50							
B-1	545.888	-0.838	0.101	0.844	0.072	0.376	0.383
B-0.1	210.090	-0.972	0.024	0.973	0.065	0.456	0.460
B-0.01	95.679	-0.996	0.004	0.996	0.052	0.523	0.525
B-0.001	48.353	-0.999	0.001	0.999	0.031	0.579	0.579
B-0.0001	25.787	-1.000	8E-05	1.000	0.026	0.628	0.629
n=100							
B-1	545.888	-0.853	0.071	0.856	0.064	0.271	0.278
B-0.1	210.090	-0.976	0.017	0.977	0.044	0.340	0.342
B-0.01	95.679	-0.997	0.003	0.997	0.022	0.399	0.400
B-0.001	48.353	-1.000	4E-04	1.000	0.009	0.445	0.445
B-0.0001	25.787	-1.000	5E-05	1.000	3E-04	0.486	0.486

Table F.3 (continued) B-life estimations from the Lognormal data (including 10% censoring) using the Weibull and Lognormal models (MRR)

ρ=2.5		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	3943.420	-0.302	0.262	0.400	0.004	0.288	0.288
B-0.1	2905.156	-0.542	0.256	0.600	0.007	0.367	0.367
B-0.01	2258.718	-0.717	0.208	0.746	0.010	0.416	0.416
B-0.001	1815.575	-0.832	0.148	0.845	0.007	0.472	0.472
B-0.0001	1484.735	-0.901	0.100	0.907	0.004	0.526	0.526
n=25							
B-1	3943.420	-0.293	0.158	0.333	-0.003	0.175	0.175
B-0.1	2905.156	-0.539	0.150	0.560	-0.015	0.216	0.216
B-0.01	2258.718	-0.718	0.125	0.729	-0.025	0.251	0.253
B-0.001	1815.575	-0.831	0.092	0.836	-0.030	0.279	0.280
B-0.0001	1484.735	-0.900	0.064	0.903	-0.037	0.306	0.309
n=50							
B-1	3943.420	-0.263	0.103	0.282	-8E-05	0.108	0.108
B-0.1	2905.156	-0.515	0.101	0.525	-0.011	0.133	0.133
B-0.01	2258.718	-0.699	0.086	0.704	-0.021	0.156	0.157
B-0.001	1815.575	-0.818	0.067	0.821	-0.029	0.178	0.180
B-0.0001	1484.735	-0.893	0.048	0.894	-0.035	0.196	0.199
n=100							
B-1	3943.420	-0.253	0.074	0.264	0.003	0.080	0.080
B-0.1	2905.156	-0.507	0.073	0.512	-0.007	0.099	0.100
B-0.01	2258.718	-0.690	0.061	0.693	-0.016	0.115	0.116
B-0.001	1815.575	-0.811	0.048	0.812	-0.024	0.130	0.133
B-0.0001	1484.735	-0.888	0.034	0.888	-0.032	0.143	0.147

Table F.4 (continued) B-life estimations from the Lognormal data (including 10% censoring) using the Weibull and Lognormal models (MLE)

ρ=2.5		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	3943.420	-0.320	0.285	0.428	0.103	0.281	0.299
B-0.1	2905.156	-0.572	0.265	0.630	0.128	0.360	0.382
B-0.01	2258.718	-0.746	0.203	0.773	0.148	0.428	0.453
B-0.001	1815.575	-0.851	0.144	0.863	0.154	0.482	0.506
B-0.0001	1484.735	-0.914	0.095	0.919	0.167	0.538	0.563
n=25							
B-1	3943.420	-0.412	0.177	0.449	0.046	0.180	0.186
B-0.1	2905.156	-0.656	0.155	0.674	0.049	0.224	0.229
B-0.01	2258.718	-0.811	0.114	0.819	0.048	0.260	0.264
B-0.001	1815.575	-0.898	0.075	0.902	0.054	0.294	0.299
B-0.0001	1484.735	-0.947	0.046	0.948	0.053	0.325	0.329
n=50							
B-1	3943.420	-0.448	0.115	0.463	0.022	0.115	0.117
B-0.1	2905.156	-0.689	0.098	0.696	0.016	0.146	0.147
B-0.01	2258.718	-0.835	0.070	0.838	0.010	0.172	0.172
B-0.001	1815.575	-0.915	0.044	0.916	0.005	0.195	0.195
B-0.0001	1484.735	-0.957	0.026	0.957	0.002	0.214	0.214
n=100							
B-1	3943.420	-0.465	0.080	0.472	0.015	0.080	0.081
B-0.1	2905.156	-0.706	0.066	0.709	0.009	0.099	0.099
B-0.01	2258.718	-0.847	0.046	0.848	0.002	0.114	0.114
B-0.001	1815.575	-0.922	0.029	0.923	-0.003	0.129	0.129
B-0.0001	1484.735	-0.962	0.017	0.962	-0.009	0.142	0.142

Table F.3 (continued) B-life estimations from the Lognormal data (including 10% censoring) using the Weibull and Lognormal models (MRR)

ρ=4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	5590.114	-0.219	0.176	0.281	-0.005	0.170	0.170
B-0.1	4618.287	-0.411	0.200	0.457	-0.013	0.211	0.211
B-0.01	3946.060	-0.572	0.194	0.604	-0.020	0.246	0.247
B-0.001	3442.578	-0.695	0.170	0.715	-0.026	0.271	0.273
B-0.0001	3035.852	-0.785	0.139	0.797	-0.029	0.302	0.304
n=25							
B-1	5590.114	-0.185	0.106	0.214	0.004	0.102	0.102
B-0.1	4618.287	-0.378	0.120	0.397	-0.001	0.125	0.125
B-0.01	3946.060	-0.540	0.120	0.553	-0.003	0.146	0.146
B-0.001	3442.578	-0.667	0.109	0.676	-0.007	0.166	0.166
B-0.0001	3035.852	-0.761	0.093	0.767	-0.011	0.179	0.179
n=50							
B-1	5590.114	-0.172	0.074	0.187	0.004	0.072	0.073
B-0.1	4618.287	-0.360	0.086	0.370	-0.004	0.090	0.091
B-0.01	3946.060	-0.522	0.087	0.529	-0.009	0.104	0.104
B-0.001	3442.578	-0.650	0.081	0.655	-0.014	0.118	0.119
B-0.0001	3035.852	-0.745	0.071	0.749	-0.020	0.131	0.133
n=100							
B-1	5590.114	-0.167	0.054	0.176	0.001	0.052	0.052
B-0.1	4618.287	-0.359	0.062	0.364	-0.005	0.065	0.065
B-0.01	3946.060	-0.520	0.064	0.523	-0.012	0.075	0.076
B-0.001	3442.578	-0.649	0.059	0.651	-0.018	0.085	0.087
B-0.0001	3035.852	-0.746	0.051	0.748	-0.023	0.094	0.097

Table F.4 (continued) B-life estimations from the Lognormal data (including 10% censoring) using the Weibull and Lognormal models (MLE)

ρ=4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	5590.114	-0.212	0.199	0.291	0.062	0.159	0.171
B-0.1	4618.287	-0.413	0.227	0.471	0.077	0.205	0.219
B-0.01	3946.060	-0.574	0.223	0.616	0.091	0.244	0.260
B-0.001	3442.578	-0.698	0.199	0.726	0.101	0.277	0.295
B-0.0001	3035.852	-0.788	0.165	0.805	0.110	0.308	0.327
n=25							
B-1	5590.114	-0.296	0.126	0.322	0.020	0.105	0.106
B-0.1	4618.287	-0.503	0.132	0.520	0.022	0.127	0.129
B-0.01	3946.060	-0.660	0.123	0.671	0.022	0.151	0.153
B-0.001	3442.578	-0.771	0.104	0.778	0.023	0.172	0.174
B-0.0001	3035.852	-0.848	0.083	0.852	0.023	0.195	0.197
n=50							
B-1	5590.114	-0.310	0.092	0.323	0.013	0.072	0.073
B-0.1	4618.287	-0.516	0.098	0.526	0.012	0.092	0.093
B-0.01	3946.060	-0.674	0.090	0.680	0.011	0.106	0.107
B-0.001	3442.578	-0.784	0.074	0.787	0.008	0.118	0.119
B-0.0001	3035.852	-0.857	0.058	0.859	0.009	0.129	0.130
n=100							
B-1	5590.114	-0.325	0.067	0.332	0.010	0.048	0.049
B-0.1	4618.287	-0.535	0.071	0.539	0.005	0.063	0.063
B-0.01	3946.060	-0.690	0.064	0.693	0.001	0.073	0.073
B-0.001	3442.578	-0.797	0.053	0.799	-0.003	0.081	0.081
B-0.0001	3035.852	-0.869	0.041	0.870	-0.006	0.089	0.089

Appendix F **Comparison of results for data from the Lognormal distribution**

Table F.5 B-life estimations from the Lognormal data (including 30% censoring) using the Weibull and Lognormal models (MRR)

ρ=0.4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	29.799	-0.862	0.194	0.884	0.178	1.546	1.557
B-0.1	4.414	-0.992	0.012	0.992	0.016	1.443	1.443
B-0.01	0.915	-1.000	0.001	1.000	-0.165	1.220	1.231
B-0.001	0.234	-1.000	2E-05	1.000	-0.272	1.071	1.105
B-0.0001	0.066	-1.000	6E-07	1.000	-0.363	0.942	1.010
n=25							
B-1	29.799	-0.839	0.184	0.859	0.045	1.035	1.036
B-0.1	4.414	-0.991	0.013	0.991	-0.171	0.973	0.988
B-0.01	0.915	-1.000	0.001	1.000	-0.303	0.893	0.943
B-0.001	0.234	-1.000	2E-05	1.000	-0.377	0.831	0.912
B-0.0001	0.066	-1.000	7E-07	1.000	-0.466	0.738	0.873
n=50							
B-1	29.799	-0.787	0.184	0.808	0.146	0.790	0.803
B-0.1	4.414	-0.985	0.017	0.985	-0.083	0.790	0.795
B-0.01	0.915	-0.999	0.001	0.999	-0.229	0.770	0.803
B-0.001	0.234	-1.000	4E-05	1.000	-0.340	0.723	0.799
B-0.0001	0.066	-1.000	2E-06	1.000	-0.433	0.675	0.802
n=100							
B-1	29.799	-0.745	0.170	0.765	0.199	0.656	0.686
B-0.1	4.414	-0.981	0.018	0.981	-0.020	0.685	0.686
B-0.01	0.915	-0.999	0.001	0.999	-0.167	0.682	0.702
B-0.001	0.234	-1.000	6E-05	1.000	-0.284	0.645	0.705
B-0.0001	0.066	-1.000	3E-06	1.000	-0.374	0.607	0.713

Table F.6 B-life estimations from the Lognormal data (including 30% censoring) using the Weibull and Lognormal models (MLE)

ρ=0.4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	29.799	-0.847	0.223	0.876	1.268	2.921	3.185
B-0.1	4.414	-0.991	0.013	0.991	1.335	3.268	3.530
B-0.01	0.915	-1.000	5E-04	1.000	1.308	3.337	3.584
B-0.001	0.234	-1.000	2E-05	1.000	1.308	3.379	3.624
B-0.0001	0.066	-1.000	5E-07	1.000	1.395	3.529	3.794
n=25							
B-1	29.799	-0.940	0.078	0.943	0.576	1.546	1.649
B-0.1	4.414	-0.998	0.003	0.998	0.445	1.651	1.710
B-0.01	0.915	-1.000	7E-05	1.000	0.339	1.670	1.704
B-0.001	0.234	-1.000	1E-06	1.000	0.246	1.653	1.672
B-0.0001	0.066	-1.000	2E-08	1.000	0.167	1.601	1.609
n=50							
B-1	29.799	-0.954	0.050	0.955	0.469	1.036	1.137
B-0.1	4.414	-0.999	0.002	0.999	0.255	1.105	1.134
B-0.01	0.915	-1.000	4E-05	1.000	0.090	1.095	1.099
B-0.001	0.234	-1.000	6E-07	1.000	-0.026	1.057	1.058
B-0.0001	0.066	-1.000	9E-09	1.000	-0.124	1.016	1.024
n=100							
B-1	29.799	-0.962	0.033	0.963	0.280	0.624	0.684
B-0.1	4.414	-0.999	0.001	0.999	0.047	0.644	0.646
B-0.01	0.915	-1.000	2E-05	1.000	-0.107	0.635	0.644
B-0.001	0.234	-1.000	3E-07	1.000	-0.226	0.621	0.661
B-0.0001	0.066	-1.000	4E-09	1.000	-0.324	0.604	0.685

Table F.5 (continued) B-life estimations from the Lognormal data (including 30% censoring) using the Weibull and Lognormal models (MRR)

ρ=0.8		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	545.888	-0.624	0.385	0.733	0.088	0.896	0.900
B-0.1	210.090	-0.908	0.122	0.916	-0.009	1.001	1.001
B-0.01	95.679	-0.981	0.027	0.981	-0.064	1.076	1.078
B-0.001	48.353	-0.996	0.005	0.996	-0.123	1.097	1.104
B-0.0001	25.787	-0.999	0.001	0.999	-0.179	1.081	1.096
n=25							
B-1	545.888	-0.593	0.268	0.650	0.060	0.553	0.556
B-0.1	210.090	-0.898	0.095	0.903	-0.050	0.623	0.625
B-0.01	95.679	-0.978	0.026	0.978	-0.132	0.660	0.673
B-0.001	48.353	-0.996	0.006	0.996	-0.199	0.691	0.719
B-0.0001	25.787	-0.999	0.001	0.999	-0.254	0.707	0.751
n=50							
B-1	545.888	-0.536	0.227	0.582	0.071	0.426	0.432
B-0.1	210.090	-0.878	0.087	0.883	-0.039	0.488	0.489
B-0.01	95.679	-0.973	0.024	0.973	-0.119	0.519	0.532
B-0.001	48.353	-0.995	0.006	0.995	-0.182	0.535	0.565
B-0.0001	25.787	-0.999	0.001	0.999	-0.237	0.552	0.601
n=100							
B-1	545.888	-0.494	0.176	0.524	0.102	0.309	0.326
B-0.1	210.090	-0.861	0.072	0.864	-0.012	0.362	0.362
B-0.01	95.679	-0.968	0.022	0.968	-0.095	0.383	0.395
B-0.001	48.353	-0.993	0.006	0.993	-0.163	0.404	0.435
B-0.0001	25.787	-0.999	0.001	0.999	-0.220	0.420	0.474

Table F.6 (continued) B-life estimations from the Lognormal data (including 30% censoring) using the Weibull and Lognormal models (MLE)

ρ=0.8		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	545.888	-0.578	0.482	0.752	0.492	1.225	1.321
B-0.1	210.090	-0.901	0.140	0.911	0.510	1.481	1.566
B-0.01	95.679	-0.980	0.030	0.980	0.529	1.673	1.755
B-0.001	48.353	-0.996	0.005	0.996	0.544	1.856	1.934
B-0.0001	25.787	-0.999	0.001	0.999	0.531	1.912	1.985
n=25							
B-1	545.888	-0.748	0.204	0.776	0.254	0.659	0.707
B-0.1	210.090	-0.954	0.052	0.955	0.186	0.777	0.799
B-0.01	95.679	-0.993	0.010	0.993	0.133	0.862	0.872
B-0.001	48.353	-0.999	0.001	0.999	0.088	0.922	0.926
B-0.0001	25.787	-1.000	2E-04	1.000	0.039	0.962	0.963
n=50							
B-1	545.888	-0.775	0.139	0.787	0.176	0.481	0.512
B-0.1	210.090	-0.961	0.035	0.962	0.074	0.556	0.561
B-0.01	95.679	-0.994	0.006	0.994	0.005	0.608	0.608
B-0.001	48.353	-0.999	0.001	0.999	-0.051	0.635	0.637
B-0.0001	25.787	-1.000	1E-04	1.000	-0.106	0.656	0.664
n=100							
B-1	545.888	-0.809	0.086	0.813	0.150	0.307	0.341
B-0.1	210.090	-0.971	0.020	0.971	0.041	0.354	0.357
B-0.01	95.679	-0.996	0.003	0.996	-0.033	0.381	0.382
B-0.001	48.353	-1.000	5E-04	1.000	-0.099	0.395	0.407
B-0.0001	25.787	-1.000	6E-05	1.000	-0.154	0.410	0.438

Table F.5 (continued) B-life estimations from the Lognormal data (including 30% censoring) using the Weibull and Lognormal models (MRR)

ρ=2.5		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	3943.420	-0.281	0.267	0.387	0.021	0.307	0.307
B-0.1	2905.156	-0.544	0.256	0.601	-0.007	0.380	0.380
B-0.01	2258.718	-0.729	0.199	0.756	-0.035	0.434	0.435
B-0.001	1815.575	-0.843	0.140	0.855	-0.055	0.482	0.485
B-0.0001	1484.735	-0.911	0.092	0.915	-0.081	0.521	0.528
n=25							
B-1	3943.420	-0.233	0.164	0.285	0.030	0.176	0.179
B-0.1	2905.156	-0.502	0.164	0.528	0.004	0.223	0.223
B-0.01	2258.718	-0.694	0.137	0.707	-0.020	0.260	0.261
B-0.001	1815.575	-0.817	0.103	0.823	-0.043	0.287	0.290
B-0.0001	1484.735	-0.892	0.071	0.895	-0.061	0.314	0.319
n=50							
B-1	3943.420	-0.219	0.122	0.251	0.030	0.131	0.134
B-0.1	2905.156	-0.488	0.123	0.503	-0.010	0.163	0.163
B-0.01	2258.718	-0.685	0.103	0.693	-0.040	0.188	0.192
B-0.001	1815.575	-0.812	0.077	0.816	-0.065	0.209	0.219
B-0.0001	1484.735	-0.890	0.054	0.891	-0.091	0.225	0.243
n=100							
B-1	3943.420	-0.198	0.088	0.216	0.031	0.092	0.097
B-0.1	2905.156	-0.466	0.092	0.476	-0.002	0.119	0.119
B-0.01	2258.718	-0.664	0.077	0.669	-0.028	0.139	0.142
B-0.001	1815.575	-0.796	0.058	0.798	-0.050	0.157	0.165
B-0.0001	1484.735	-0.878	0.043	0.879	-0.069	0.169	0.183

Table F.6 (continued) B-life estimations from the Lognormal data (including 30% censoring) using the Weibull and Lognormal models (MLE)

ρ=2.5		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	3943.420	-0.268	0.329	0.425	0.111	0.316	0.335
B-0.1	2905.156	-0.544	0.303	0.622	0.110	0.394	0.409
B-0.01	2258.718	-0.734	0.225	0.768	0.103	0.464	0.475
B-0.001	1815.575	-0.851	0.149	0.864	0.099	0.512	0.521
B-0.0001	1484.735	-0.916	0.095	0.921	0.093	0.567	0.575
n=25							
B-1	3943.420	-0.368	0.181	0.410	0.059	0.197	0.206
B-0.1	2905.156	-0.635	0.158	0.654	0.036	0.243	0.246
B-0.01	2258.718	-0.800	0.116	0.809	0.021	0.283	0.283
B-0.001	1815.575	-0.895	0.077	0.898	0.012	0.318	0.318
B-0.0001	1484.735	-0.945	0.046	0.946	0.003	0.351	0.351
n=50							
B-1	3943.420	-0.389	0.126	0.409	0.053	0.130	0.141
B-0.1	2905.156	-0.657	0.110	0.666	0.022	0.161	0.163
B-0.01	2258.718	-0.816	0.079	0.820	0.000	0.189	0.189
B-0.001	1815.575	-0.905	0.051	0.906	-0.015	0.207	0.208
B-0.0001	1484.735	-0.951	0.031	0.952	-0.032	0.225	0.227
n=100							
B-1	3943.420	-0.403	0.098	0.414	0.046	0.094	0.105
B-0.1	2905.156	-0.668	0.084	0.674	0.018	0.119	0.120
B-0.01	2258.718	-0.825	0.060	0.827	-0.003	0.135	0.135
B-0.001	1815.575	-0.911	0.039	0.911	-0.022	0.152	0.154
B-0.0001	1484.735	-0.955	0.023	0.955	-0.041	0.165	0.170

Table F.5 (continued) B-life estimations from the Lognormal data (including 30% censoring) using the Weibull and Lognormal models (MRR)

ρ=4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	5590.114	-0.189	0.187	0.266	0.008	0.191	0.192
B-0.1	4618.287	-0.394	0.224	0.453	-0.013	0.238	0.238
B-0.01	3946.060	-0.561	0.218	0.602	-0.031	0.280	0.281
B-0.001	3442.578	-0.686	0.193	0.713	-0.047	0.315	0.318
B-0.0001	3035.852	-0.781	0.159	0.797	-0.061	0.347	0.352
n=25							
B-1	5590.114	-0.158	0.117	0.197	0.015	0.115	0.116
B-0.1	4618.287	-0.360	0.138	0.385	-0.003	0.144	0.144
B-0.01	3946.060	-0.529	0.137	0.546	-0.020	0.169	0.170
B-0.001	3442.578	-0.661	0.124	0.672	-0.033	0.192	0.195
B-0.0001	3035.852	-0.757	0.107	0.765	-0.046	0.211	0.216
n=50							
B-1	5590.114	-0.139	0.087	0.164	0.018	0.084	0.086
B-0.1	4618.287	-0.340	0.103	0.355	-0.002	0.107	0.107
B-0.01	3946.060	-0.508	0.104	0.518	-0.021	0.125	0.126
B-0.001	3442.578	-0.640	0.096	0.647	-0.032	0.139	0.142
B-0.0001	3035.852	-0.740	0.085	0.745	-0.047	0.151	0.159
n=100							
B-1	5590.114	-0.129	0.059	0.142	0.019	0.060	0.063
B-0.1	4618.287	-0.329	0.070	0.337	-0.001	0.075	0.075
B-0.01	3946.060	-0.499	0.071	0.504	-0.021	0.086	0.088
B-0.001	3442.578	-0.635	0.064	0.638	-0.035	0.097	0.103
B-0.0001	3035.852	-0.736	0.056	0.738	-0.049	0.105	0.116

Table F.6 (continued) B-life estimations from the Lognormal data (including 30% censoring) using the Weibull and Lognormal models (MLE)

ρ=4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	5590.114	-0.181	0.231	0.294	0.079	0.183	0.200
B-0.1	4618.287	-0.386	0.269	0.471	0.075	0.237	0.248
B-0.01	3946.060	-0.557	0.263	0.616	0.076	0.287	0.297
B-0.001	3442.578	-0.683	0.230	0.721	0.077	0.324	0.333
B-0.0001	3035.852	-0.779	0.187	0.801	0.076	0.366	0.374
n=25							
B-1	5590.114	-0.243	0.134	0.277	0.049	0.106	0.117
B-0.1	4618.287	-0.459	0.144	0.481	0.038	0.137	0.142
B-0.01	3946.060	-0.626	0.134	0.640	0.027	0.160	0.162
B-0.001	3442.578	-0.748	0.112	0.756	0.018	0.179	0.179
B-0.0001	3035.852	-0.831	0.090	0.836	0.007	0.196	0.196
n=50							
B-1	5590.114	-0.261	0.099	0.280	0.037	0.078	0.086
B-0.1	4618.287	-0.481	0.108	0.493	0.020	0.097	0.099
B-0.01	3946.060	-0.649	0.098	0.657	0.006	0.112	0.112
B-0.001	3442.578	-0.769	0.082	0.773	-0.006	0.126	0.126
B-0.0001	3035.852	-0.849	0.064	0.851	-0.019	0.138	0.139
n=100							
B-1	5590.114	-0.286	0.070	0.294	0.023	0.053	0.057
B-0.1	4618.287	-0.511	0.074	0.516	0.003	0.067	0.067
B-0.01	3946.060	-0.675	0.068	0.678	-0.012	0.078	0.079
B-0.001	3442.578	-0.789	0.055	0.791	-0.026	0.089	0.092
B-0.0001	3035.852	-0.864	0.043	0.865	-0.039	0.099	0.106

Appendix F **Comparison of results for data from the Lognormal distribution**

Table F.7 B-life estimations from the Lognormal data (including 50% censoring) using the Weibull and Lognormal models (MRR)

ρ=0.4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	29.799	-0.792	0.300	0.847	0.361	1.878	1.913
B-0.1	4.414	-0.990	0.015	0.990	0.009	1.467	1.467
B-0.01	0.915	-1.000	0.001	1.000	-0.182	1.205	1.219
B-0.001	0.234	-1.000	2E-05	1.000	-0.345	0.969	1.028
B-0.0001	0.066	-1.000	7E-07	1.000	-0.470	0.786	0.916
n=25							
B-1	29.799	-0.700	0.344	0.780	0.478	1.523	1.597
B-0.1	4.414	-0.980	0.027	0.981	0.071	1.301	1.303
B-0.01	0.915	-0.999	0.001	0.999	-0.163	1.108	1.120
B-0.001	0.234	-1.000	5E-05	1.000	-0.337	0.920	0.980
B-0.0001	0.066	-1.000	2E-06	1.000	-0.453	0.778	0.900
n=50							
B-1	29.799	-0.612	0.362	0.711	0.511	1.261	1.361
B-0.1	4.414	-0.973	0.033	0.974	0.031	1.063	1.063
B-0.01	0.915	-0.999	0.002	0.999	-0.252	0.872	0.908
B-0.001	0.234	-1.000	8E-05	1.000	-0.440	0.705	0.831
B-0.0001	0.066	-1.000	3E-06	1.000	-0.564	0.572	0.803
n=100							
B-1	29.799	-0.519	0.322	0.611	0.602	0.934	1.111
B-0.1	4.414	-0.964	0.035	0.965	0.098	0.837	0.842
B-0.01	0.915	-0.998	0.002	0.998	-0.200	0.695	0.723
B-0.001	0.234	-1.000	1E-04	1.000	-0.390	0.585	0.703
B-0.0001	0.066	-1.000	5E-06	1.000	-0.521	0.504	0.725

Table F.8 B-life estimations from the Lognormal data (including 50% censoring) using the Weibull and Lognormal models (MLE)

ρ=0.4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	29.799	-0.716	0.416	0.828	1.999	4.062	4.528
B-0.1	4.414	-0.985	0.022	0.986	1.536	3.677	3.985
B-0.01	0.915	-0.999	0.001	0.999	1.322	3.412	3.660
B-0.001	0.234	-1.000	2E-05	1.000	1.088	3.083	3.270
B-0.0001	0.066	-1.000	6E-07	1.000	0.880	2.782	2.918
n=25							
B-1	29.799	-0.862	0.188	0.882	1.051	2.146	2.390
B-0.1	4.414	-0.995	0.007	0.995	0.581	2.007	2.089
B-0.01	0.915	-1.000	2E-04	1.000	0.245	1.689	1.706
B-0.001	0.234	-1.000	4E-06	1.000	0.004	1.412	1.412
B-0.0001	0.066	-1.000	7E-08	1.000	-0.142	1.231	1.239
n=50							
B-1	29.799	-0.887	0.127	0.896	0.892	1.593	1.826
B-0.1	4.414	-0.997	0.004	0.997	0.354	1.410	1.453
B-0.01	0.915	-1.000	9E-05	1.000	0.020	1.195	1.195
B-0.001	0.234	-1.000	1E-06	1.000	-0.194	1.010	1.029
B-0.0001	0.066	-1.000	2E-08	1.000	-0.359	0.846	0.918
n=100							
B-1	29.799	-0.912	0.082	0.916	0.728	1.051	1.279
B-0.1	4.414	-0.998	0.003	0.998	0.175	0.895	0.912
B-0.01	0.915	-1.000	5E-05	1.000	-0.143	0.765	0.778
B-0.001	0.234	-1.000	8E-07	1.000	-0.346	0.651	0.737
B-0.0001	0.066	-1.000	1E-08	1.000	-0.489	0.551	0.737

Table F.7 (continued) B-life estimations from the Lognormal data (including 50% censoring) using the Weibull and Lognormal models (MRR)

ρ=0.8		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	545.888	-0.508	0.559	0.755	0.286	1.244	1.277
B-0.1	210.090	-0.885	0.159	0.899	0.123	1.289	1.294
B-0.01	95.679	-0.975	0.036	0.976	-0.015	1.251	1.251
B-0.001	48.353	-0.995	0.007	0.995	-0.095	1.225	1.228
B-0.0001	25.787	-0.999	0.001	0.999	-0.168	1.159	1.171
n=25							
B-1	545.888	-0.440	0.408	0.600	0.240	0.760	0.797
B-0.1	210.090	-0.857	0.151	0.870	0.071	0.831	0.834
B-0.01	95.679	-0.969	0.039	0.970	-0.070	0.844	0.846
B-0.001	48.353	-0.994	0.009	0.994	-0.165	0.833	0.849
B-0.0001	25.787	-0.999	0.002	0.999	-0.247	0.811	0.848
n=50							
B-1	545.888	-0.383	0.315	0.496	0.237	0.555	0.604
B-0.1	210.090	-0.841	0.121	0.849	0.021	0.591	0.592
B-0.01	95.679	-0.965	0.034	0.965	-0.118	0.598	0.609
B-0.001	48.353	-0.993	0.008	0.993	-0.234	0.579	0.625
B-0.0001	25.787	-0.999	0.002	0.999	-0.330	0.551	0.642
n=100							
B-1	545.888	-0.308	0.253	0.399	0.274	0.416	0.498
B-0.1	210.090	-0.809	0.108	0.816	0.049	0.442	0.445
B-0.01	95.679	-0.955	0.034	0.956	-0.098	0.452	0.462
B-0.001	48.353	-0.991	0.009	0.991	-0.207	0.453	0.498
B-0.0001	25.787	-0.998	0.002	0.998	-0.300	0.440	0.532

Table F.8 (continued) B-life estimations from the Lognormal data (including 50% censoring) using the Weibull and Lognormal models (MLE)

ρ=0.8		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	545.888	-0.476	0.625	0.786	0.635	1.436	1.570
B-0.1	210.090	-0.881	0.170	0.897	0.524	1.651	1.732
B-0.01	95.679	-0.976	0.035	0.977	0.438	1.743	1.797
B-0.001	48.353	-0.996	0.006	0.996	0.363	1.757	1.794
B-0.0001	25.787	-0.999	0.001	0.999	0.281	1.728	1.751
n=25							
B-1	545.888	-0.678	0.275	0.731	0.367	0.814	0.893
B-0.1	210.090	-0.944	0.064	0.946	0.198	0.889	0.910
B-0.01	95.679	-0.991	0.011	0.991	0.066	0.909	0.911
B-0.001	48.353	-0.999	0.002	0.999	-0.035	0.926	0.927
B-0.0001	25.787	-1.000	2E-04	1.000	-0.121	0.915	0.923
n=50							
B-1	545.888	-0.669	0.217	0.703	0.379	0.590	0.701
B-0.1	210.090	-0.944	0.054	0.946	0.163	0.641	0.662
B-0.01	95.679	-0.992	0.010	0.992	0.019	0.663	0.664
B-0.001	48.353	-0.999	0.001	0.999	-0.095	0.659	0.666
B-0.0001	25.787	-1.000	2E-04	1.000	-0.184	0.650	0.676
n=100							
B-1	545.888	-0.719	0.141	0.732	0.292	0.410	0.503
B-0.1	210.090	-0.956	0.032	0.957	0.068	0.437	0.442
B-0.01	95.679	-0.994	0.005	0.994	-0.090	0.446	0.455
B-0.001	48.353	-0.999	0.001	0.999	-0.209	0.446	0.492
B-0.0001	25.787	-1.000	9E-05	1.000	-0.310	0.428	0.528

Table F.7 (continued) B-life estimations from the Lognormal data (including 50% censoring) using the Weibull and Lognormal models (MRR)

ρ=2.5		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	3943.420	-0.204	0.341	0.397	0.079	0.371	0.379
B-0.1	2905.156	-0.487	0.336	0.591	0.027	0.469	0.470
B-0.01	2258.718	-0.687	0.270	0.738	-0.007	0.551	0.551
B-0.001	1815.575	-0.814	0.193	0.837	-0.041	0.601	0.603
B-0.0001	1484.735	-0.893	0.127	0.902	-0.065	0.651	0.654
n=25							
B-1	3943.420	-0.175	0.207	0.271	0.063	0.228	0.237
B-0.1	2905.156	-0.475	0.205	0.517	0.003	0.277	0.277
B-0.01	2258.718	-0.682	0.164	0.702	-0.045	0.312	0.315
B-0.001	1815.575	-0.813	0.123	0.822	-0.085	0.341	0.351
B-0.0001	1484.735	-0.892	0.083	0.896	-0.118	0.363	0.381
n=50							
B-1	3943.420	-0.149	0.146	0.209	0.062	0.147	0.159
B-0.1	2905.156	-0.450	0.144	0.472	0.000	0.182	0.182
B-0.01	2258.718	-0.661	0.119	0.672	-0.053	0.212	0.218
B-0.001	1815.575	-0.796	0.089	0.801	-0.095	0.232	0.251
B-0.0001	1484.735	-0.880	0.063	0.882	-0.133	0.248	0.281
n=100							
B-1	3943.420	-0.116	0.105	0.156	0.074	0.112	0.134
B-0.1	2905.156	-0.420	0.107	0.433	0.009	0.140	0.140
B-0.01	2258.718	-0.639	0.092	0.646	-0.043	0.162	0.168
B-0.001	1815.575	-0.782	0.070	0.785	-0.086	0.174	0.194
B-0.0001	1484.735	-0.870	0.050	0.872	-0.124	0.185	0.222

Table F.8 (continued) B-life estimations from the Lognormal data (including 50% censoring) using the Weibull and Lognormal models (MLE)

ρ=2.5		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	3943.420	-0.167	0.385	0.420	0.207	0.400	0.450
B-0.1	2905.156	-0.463	0.367	0.591	0.194	0.493	0.530
B-0.01	2258.718	-0.683	0.285	0.740	0.184	0.586	0.614
B-0.001	1815.575	-0.815	0.197	0.839	0.170	0.648	0.670
B-0.0001	1484.735	-0.894	0.125	0.903	0.160	0.717	0.734
n=25							
B-1	3943.420	-0.295	0.222	0.369	0.112	0.224	0.250
B-0.1	2905.156	-0.595	0.202	0.629	0.063	0.276	0.283
B-0.01	2258.718	-0.777	0.147	0.791	0.019	0.313	0.313
B-0.001	1815.575	-0.882	0.095	0.887	-0.016	0.349	0.350
B-0.0001	1484.735	-0.939	0.057	0.941	-0.051	0.375	0.378
n=50							
B-1	3943.420	-0.298	0.160	0.338	0.104	0.160	0.191
B-0.1	2905.156	-0.600	0.142	0.617	0.044	0.205	0.210
B-0.01	2258.718	-0.786	0.101	0.792	-0.001	0.241	0.241
B-0.001	1815.575	-0.888	0.065	0.891	-0.045	0.262	0.266
B-0.0001	1484.735	-0.943	0.040	0.944	-0.078	0.284	0.294
n=100							
B-1	3943.420	-0.331	0.111	0.349	0.088	0.112	0.142
B-0.1	2905.156	-0.632	0.094	0.639	0.019	0.136	0.137
B-0.01	2258.718	-0.807	0.066	0.809	-0.032	0.156	0.159
B-0.001	1815.575	-0.902	0.042	0.903	-0.073	0.170	0.185
B-0.0001	1484.735	-0.951	0.026	0.951	-0.108	0.183	0.213

Table F.7 (continued) B-life estimations from the Lognormal data (including 50% censoring) using the Weibull and Lognormal models (MRR)

ρ=4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	5590.114	-0.147	0.219	0.264	0.039	0.212	0.215
B-0.1	4618.287	-0.358	0.260	0.443	0.007	0.273	0.273
B-0.01	3946.060	-0.530	0.257	0.590	-0.014	0.323	0.324
B-0.001	3442.578	-0.667	0.234	0.707	-0.037	0.363	0.365
B-0.0001	3035.852	-0.766	0.194	0.790	-0.055	0.395	0.399
n=25							
B-1	5590.114	-0.106	0.138	0.175	0.045	0.138	0.145
B-0.1	4618.287	-0.318	0.166	0.359	0.009	0.170	0.170
B-0.01	3946.060	-0.495	0.166	0.522	-0.013	0.205	0.206
B-0.001	3442.578	-0.635	0.151	0.653	-0.035	0.226	0.229
B-0.0001	3035.852	-0.740	0.129	0.751	-0.054	0.247	0.253
n=50							
B-1	5590.114	-0.086	0.100	0.132	0.045	0.097	0.107
B-0.1	4618.287	-0.300	0.117	0.322	0.006	0.123	0.123
B-0.01	3946.060	-0.481	0.121	0.496	-0.026	0.144	0.147
B-0.001	3442.578	-0.623	0.111	0.633	-0.054	0.160	0.169
B-0.0001	3035.852	-0.729	0.095	0.735	-0.078	0.175	0.191
n=100							
B-1	5590.114	-0.074	0.069	0.102	0.046	0.068	0.082
B-0.1	4618.287	-0.286	0.086	0.299	0.004	0.088	0.088
B-0.01	3946.060	-0.468	0.087	0.476	-0.028	0.103	0.107
B-0.001	3442.578	-0.612	0.080	0.618	-0.053	0.117	0.128
B-0.0001	3035.852	-0.720	0.070	0.723	-0.078	0.130	0.152

Table F.8 (continued) B-life estimations from the Lognormal data (including 50% censoring) using the Weibull and Lognormal models (MLE)

ρ=4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	5590.114	-0.113	0.246	0.270	0.110	0.214	0.241
B-0.1	4618.287	-0.335	0.295	0.446	0.090	0.280	0.294
B-0.01	3946.060	-0.521	0.280	0.592	0.082	0.331	0.341
B-0.001	3442.578	-0.662	0.248	0.707	0.064	0.372	0.378
B-0.0001	3035.852	-0.763	0.206	0.791	0.053	0.413	0.416
n=25							
B-1	5590.114	-0.185	0.152	0.240	0.075	0.127	0.148
B-0.1	4618.287	-0.418	0.168	0.451	0.049	0.166	0.174
B-0.01	3946.060	-0.598	0.159	0.619	0.026	0.193	0.195
B-0.001	3442.578	-0.728	0.137	0.741	0.008	0.218	0.218
B-0.0001	3035.852	-0.818	0.110	0.825	-0.011	0.238	0.238
n=50							
B-1	5590.114	-0.205	0.116	0.236	0.061	0.093	0.111
B-0.1	4618.287	-0.445	0.128	0.463	0.023	0.122	0.124
B-0.01	3946.060	-0.624	0.116	0.635	-0.006	0.144	0.144
B-0.001	3442.578	-0.751	0.098	0.757	-0.033	0.163	0.167
B-0.0001	3035.852	-0.837	0.077	0.841	-0.055	0.181	0.189
n=100							
B-1	5590.114	-0.218	0.082	0.233	0.056	0.070	0.090
B-0.1	4618.287	-0.458	0.091	0.467	0.017	0.089	0.090
B-0.01	3946.060	-0.638	0.084	0.644	-0.014	0.105	0.106
B-0.001	3442.578	-0.762	0.070	0.766	-0.041	0.118	0.124
B-0.0001	3035.852	-0.846	0.055	0.848	-0.064	0.129	0.144

Appendix F **Comparison of results for data from the Lognormal distribution**

Table F.9 B-life estimations from the Lognormal data (including 70% censoring) using the Weibull and Lognormal models (MRR)

ρ=0.4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	29.799	-0.567	0.629	0.847	1.214	3.122	3.350
B-0.1	4.414	-0.970	0.045	0.971	0.670	2.455	2.544
B-0.01	0.915	-0.999	0.002	0.999	0.293	1.913	1.936
B-0.001	0.234	-1.000	8E-05	1.000	0.073	1.590	1.592
B-0.0001	0.066	-1.000	3E-06	1.000	-0.090	1.348	1.352
n=25							
B-1	29.799	-0.301	0.850	0.902	1.293	2.683	2.979
B-0.1	4.414	-0.955	0.064	0.958	0.442	1.925	1.975
B-0.01	0.915	-0.998	0.003	0.998	-0.022	1.385	1.386
B-0.001	0.234	-1.000	1E-04	1.000	-0.333	0.969	1.025
B-0.0001	0.066	-1.000	4E-06	1.000	-0.521	0.703	0.875
n=50							
B-1	29.799	-0.105	0.827	0.834	1.473	2.101	2.566
B-0.1	4.414	-0.938	0.078	0.942	0.361	1.462	1.506
B-0.01	0.915	-0.997	0.004	0.997	-0.164	1.020	1.033
B-0.001	0.234	-1.000	2E-04	1.000	-0.451	0.728	0.856
B-0.0001	0.066	-1.000	7E-06	1.000	-0.622	0.522	0.812
n=100							
B-1	29.799	0.065	0.779	0.782	1.575	1.811	2.401
B-0.1	4.414	-0.924	0.084	0.928	0.357	1.254	1.304
B-0.01	0.915	-0.996	0.005	0.996	-0.182	0.875	0.894
B-0.001	0.234	-1.000	2E-04	1.000	-0.481	0.606	0.774
B-0.0001	0.066	-1.000	9E-06	1.000	-0.656	0.427	0.783

Table F.10 B-life estimations from the Lognormal data (including 70% censoring) using the Weibull and Lognormal models (MLE)

ρ=0.4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	29.799	-0.518	0.704	0.874	3.048	5.481	6.272
B-0.1	4.414	-0.972	0.042	0.973	2.207	4.650	5.148
B-0.01	0.915	-0.999	0.002	0.999	1.709	3.991	4.342
B-0.001	0.234	-1.000	6E-05	1.000	1.423	3.583	3.855
B-0.0001	0.066	-1.000	2E-06	1.000	1.160	3.200	3.404
n=25							
B-1	29.799	-0.609	0.539	0.813	2.173	3.807	4.383
B-0.1	4.414	-0.988	0.018	0.988	0.774	2.447	2.566
B-0.01	0.915	-1.000	4E-04	1.000	0.129	1.624	1.629
B-0.001	0.234	-1.000	8E-06	1.000	-0.249	1.098	1.126
B-0.0001	0.066	-1.000	1E-07	1.000	-0.496	0.744	0.894
n=50							
B-1	29.799	-0.675	0.364	0.767	1.887	2.779	3.359
B-0.1	4.414	-0.990	0.013	0.991	0.537	1.807	1.886
B-0.01	0.915	-1.000	3E-04	1.000	-0.052	1.234	1.235
B-0.001	0.234	-1.000	5E-06	1.000	-0.392	0.833	0.921
B-0.0001	0.066	-1.000	8E-08	1.000	-0.597	0.569	0.825
n=100							
B-1	29.799	-0.740	0.239	0.778	1.531	1.756	2.330
B-0.1	4.414	-0.994	0.008	0.994	0.247	1.116	1.143
B-0.01	0.915	-1.000	1E-04	1.000	-0.291	0.730	0.786
B-0.001	0.234	-1.000	2E-06	1.000	-0.570	0.488	0.751
B-0.0001	0.066	-1.000	3E-08	1.000	-0.724	0.333	0.797

Table F.9 (continued) B-life estimations from the Lognormal data (including 70% censoring) using the Weibull and Lognormal models (MRR)

ρ=0.8		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	545.888	-0.417	0.691	0.807	0.387	1.468	1.518
B-0.1	210.090	-0.862	0.198	0.885	0.171	1.458	1.468
B-0.01	95.679	-0.971	0.043	0.972	0.045	1.420	1.421
B-0.001	48.353	-0.994	0.008	0.994	-0.049	1.344	1.345
B-0.0001	25.787	-0.999	0.002	0.999	-0.158	1.214	1.224
n=25							
B-1	545.888	-0.240	0.570	0.619	0.426	0.985	1.073
B-0.1	210.090	-0.818	0.202	0.842	0.065	0.941	0.944
B-0.01	95.679	-0.963	0.048	0.964	-0.138	0.887	0.898
B-0.001	48.353	-0.993	0.009	0.993	-0.312	0.778	0.838
B-0.0001	25.787	-0.999	0.002	0.999	-0.427	0.690	0.812
n=50							
B-1	545.888	-0.037	0.544	0.545	0.581	0.800	0.989
B-0.1	210.090	-0.749	0.219	0.780	0.193	0.811	0.834
B-0.01	95.679	-0.944	0.062	0.946	-0.058	0.759	0.761
B-0.001	48.353	-0.989	0.014	0.989	-0.236	0.702	0.741
B-0.0001	25.787	-0.998	0.003	0.998	-0.366	0.641	0.738
n=100							
B-1	545.888	0.057	0.421	0.425	0.629	0.608	0.875
B-0.1	210.090	-0.718	0.183	0.741	0.211	0.601	0.636
B-0.01	95.679	-0.935	0.056	0.937	-0.058	0.577	0.580
B-0.001	48.353	-0.987	0.014	0.987	-0.243	0.528	0.582
B-0.0001	25.787	-0.997	0.003	0.997	-0.384	0.479	0.614

Table F.10 (continued) B-life estimations from the Lognormal data (including 70% censoring) using the Weibull and Lognormal models (MLE)

ρ=0.8		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	545.888	-0.327	0.841	0.902	1.010	1.909	2.160
B-0.1	210.090	-0.848	0.220	0.876	0.770	2.079	2.217
B-0.01	95.679	-0.971	0.043	0.972	0.626	2.113	2.203
B-0.001	48.353	-0.995	0.008	0.995	0.466	2.024	2.077
B-0.0001	25.787	-0.999	0.001	0.999	0.366	1.937	1.971
n=25							
B-1	545.888	-0.346	0.608	0.700	0.818	1.308	1.543
B-0.1	210.090	-0.880	0.153	0.893	0.425	1.333	1.399
B-0.01	95.679	-0.981	0.027	0.981	0.137	1.233	1.241
B-0.001	48.353	-0.997	0.004	0.997	-0.060	1.107	1.108
B-0.0001	25.787	-1.000	0.001	1.000	-0.210	0.997	1.019
n=50							
B-1	545.888	-0.444	0.400	0.598	0.696	0.866	1.112
B-0.1	210.090	-0.908	0.095	0.913	0.259	0.856	0.894
B-0.01	95.679	-0.987	0.016	0.987	-0.021	0.805	0.805
B-0.001	48.353	-0.998	0.002	0.998	-0.213	0.725	0.756
B-0.0001	25.787	-1.000	3E-04	1.000	-0.353	0.659	0.747
n=100							
B-1	545.888	-0.467	0.276	0.543	0.629	0.595	0.866
B-0.1	210.090	-0.917	0.069	0.920	0.169	0.584	0.608
B-0.01	95.679	-0.989	0.011	0.989	-0.114	0.539	0.551
B-0.001	48.353	-0.999	0.002	0.999	-0.305	0.482	0.570
B-0.0001	25.787	-1.000	2E-04	1.000	-0.449	0.433	0.624

Table F.9 (continued) B-life estimations from the Lognormal data (including 70% censoring) using the Weibull and Lognormal models (MRR)

ρ=2.5		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	3943.420	-0.167	0.418	0.450	0.101	0.463	0.474
B-0.1	2905.156	-0.477	0.406	0.626	0.038	0.570	0.571
B-0.01	2258.718	-0.681	0.317	0.752	-0.014	0.652	0.652
B-0.001	1815.575	-0.814	0.218	0.842	-0.062	0.707	0.710
B-0.0001	1484.735	-0.892	0.138	0.903	-0.104	0.748	0.755
n=25							
B-1	3943.420	-0.065	0.249	0.257	0.145	0.258	0.296
B-0.1	2905.156	-0.399	0.266	0.479	0.048	0.323	0.326
B-0.01	2258.718	-0.635	0.226	0.674	-0.033	0.368	0.370
B-0.001	1815.575	-0.785	0.163	0.802	-0.093	0.406	0.416
B-0.0001	1484.735	-0.878	0.110	0.885	-0.139	0.435	0.457
n=50							
B-1	3943.420	-0.021	0.166	0.167	0.155	0.181	0.239
B-0.1	2905.156	-0.361	0.179	0.403	0.054	0.223	0.230
B-0.01	2258.718	-0.606	0.152	0.624	-0.020	0.254	0.255
B-0.001	1815.575	-0.764	0.115	0.773	-0.079	0.277	0.288
B-0.0001	1484.735	-0.862	0.081	0.866	-0.130	0.296	0.324
n=100							
B-1	3943.420	0.014	0.134	0.135	0.168	0.139	0.218
B-0.1	2905.156	-0.340	0.141	0.368	0.059	0.175	0.185
B-0.01	2258.718	-0.588	0.122	0.600	-0.024	0.196	0.198
B-0.001	1815.575	-0.752	0.092	0.758	-0.091	0.214	0.233
B-0.0001	1484.735	-0.853	0.065	0.855	-0.149	0.227	0.271

Table F.10 (continued) B-life estimations from the Lognormal data (including 70% censoring) using the Weibull and Lognormal models (MLE)

ρ=2.5		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	3943.420	-0.124	0.430	0.448	0.219	0.432	0.484
B-0.1	2905.156	-0.459	0.402	0.611	0.179	0.543	0.572
B-0.01	2258.718	-0.680	0.310	0.747	0.132	0.624	0.638
B-0.001	1815.575	-0.816	0.213	0.843	0.087	0.682	0.687
B-0.0001	1484.735	-0.895	0.133	0.905	0.052	0.738	0.740
n=25							
B-1	3943.420	-0.133	0.274	0.305	0.202	0.277	0.343
B-0.1	2905.156	-0.495	0.261	0.559	0.099	0.350	0.364
B-0.01	2258.718	-0.720	0.194	0.746	0.020	0.399	0.400
B-0.001	1815.575	-0.850	0.130	0.860	-0.043	0.430	0.433
B-0.0001	1484.735	-0.921	0.081	0.925	-0.097	0.457	0.467
n=50							
B-1	3943.420	-0.198	0.206	0.286	0.168	0.206	0.265
B-0.1	2905.156	-0.552	0.187	0.582	0.050	0.254	0.259
B-0.01	2258.718	-0.763	0.133	0.774	-0.033	0.286	0.288
B-0.001	1815.575	-0.879	0.086	0.883	-0.100	0.312	0.328
B-0.0001	1484.735	-0.939	0.051	0.941	-0.157	0.329	0.365
n=100							
B-1	3943.420	-0.192	0.133	0.234	0.166	0.134	0.213
B-0.1	2905.156	-0.553	0.123	0.567	0.047	0.173	0.179
B-0.01	2258.718	-0.767	0.087	0.772	-0.042	0.195	0.199
B-0.001	1815.575	-0.882	0.056	0.884	-0.111	0.214	0.241
B-0.0001	1484.735	-0.941	0.034	0.942	-0.172	0.226	0.284

Table F.9 (continued) B-life estimations from the Lognormal data (including 70% censoring) using the Weibull and Lognormal models (MRR)

ρ=4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	5590.114	-0.118	0.251	0.277	0.052	0.247	0.253
B-0.1	4618.287	-0.337	0.306	0.455	0.014	0.319	0.319
B-0.01	3946.060	-0.514	0.303	0.596	-0.019	0.380	0.381
B-0.001	3442.578	-0.649	0.274	0.705	-0.052	0.426	0.429
B-0.0001	3035.852	-0.752	0.229	0.786	-0.074	0.469	0.475
n=25							
B-1	5590.114	-0.026	0.165	0.168	0.096	0.166	0.191
B-0.1	4618.287	-0.256	0.206	0.328	0.045	0.213	0.217
B-0.01	3946.060	-0.451	0.214	0.499	0.001	0.253	0.253
B-0.001	3442.578	-0.601	0.198	0.633	-0.035	0.280	0.282
B-0.0001	3035.852	-0.714	0.170	0.734	-0.067	0.302	0.309
n=50							
B-1	5590.114	-0.018	0.112	0.114	0.090	0.110	0.142
B-0.1	4618.287	-0.252	0.138	0.287	0.026	0.143	0.146
B-0.01	3946.060	-0.445	0.140	0.467	-0.020	0.167	0.168
B-0.001	3442.578	-0.597	0.132	0.611	-0.061	0.183	0.193
B-0.0001	3035.852	-0.711	0.114	0.720	-0.095	0.201	0.222
n=100							
B-1	5590.114	0.004	0.078	0.078	0.096	0.079	0.124
B-0.1	4618.287	-0.228	0.099	0.249	0.027	0.099	0.103
B-0.01	3946.060	-0.428	0.101	0.440	-0.025	0.115	0.118
B-0.001	3442.578	-0.585	0.096	0.592	-0.070	0.129	0.147
B-0.0001	3035.852	-0.700	0.084	0.705	-0.109	0.139	0.177

Table F.10 (continued) B-life estimations from the Lognormal data (including 70% censoring) using the Weibull and Lognormal models (MLE)

ρ=4		Weibull			Lognormal		
n=10	True value	Bias/True	S_{MAD}/True	RMSE/True	Bias/True	S_{MAD}/True	RMSE/True
B-1	5590.114	-0.071	0.302	0.310	0.146	0.274	0.310
B-0.1	4618.287	-0.307	0.356	0.470	0.114	0.360	0.378
B-0.01	3946.060	-0.497	0.346	0.605	0.093	0.425	0.435
B-0.001	3442.578	-0.649	0.296	0.713	0.074	0.478	0.484
B-0.0001	3035.852	-0.755	0.242	0.793	0.059	0.520	0.523
n=25							
B-1	5590.114	-0.085	0.187	0.205	0.132	0.174	0.219
B-0.1	4618.287	-0.344	0.217	0.407	0.073	0.225	0.237
B-0.01	3946.060	-0.549	0.207	0.587	0.029	0.265	0.267
B-0.001	3442.578	-0.695	0.175	0.717	-0.008	0.299	0.299
B-0.0001	3035.852	-0.798	0.140	0.810	-0.042	0.324	0.327
n=50							
B-1	5590.114	-0.112	0.136	0.176	0.107	0.108	0.151
B-0.1	4618.287	-0.374	0.159	0.407	0.043	0.142	0.148
B-0.01	3946.060	-0.575	0.148	0.594	-0.008	0.168	0.168
B-0.001	3442.578	-0.717	0.125	0.728	-0.051	0.189	0.196
B-0.0001	3035.852	-0.815	0.099	0.821	-0.088	0.206	0.224
n=100							
B-1	5590.114	-0.118	0.096	0.152	0.105	0.086	0.136
B-0.1	4618.287	-0.390	0.107	0.404	0.036	0.112	0.117
B-0.01	3946.060	-0.592	0.099	0.600	-0.020	0.128	0.129
B-0.001	3442.578	-0.733	0.083	0.738	-0.066	0.141	0.156
B-0.0001	3035.852	-0.827	0.066	0.830	-0.107	0.153	0.186