## Appendix

## **Expanded Simulation Results**

This appendix contains more complete versions of the tables in "Comparing the Performance of Improved Classify-Analyze Approaches For Distal Outcomes in Latent Profile Analysis" by Dziak, Bray, Zhang, Zhang and Lanza. For example, to save space, the paper omitted the medium effect size scenarios for all distributions, and the good measurement quality scenarios for non-binary distributions. All scenarios are considered in this appendix, intended as an online supplemental document.

Table A1

Distal Outcome Distributions by Scenario

		J							
F	Response Probal	bility $P(Y=1 C)$	) In						
	In Binary Out	come Scenario	)						
	High	Medium	Low						
	Class	Class	Class						
Effect Size	Scenario								
Large	0.800	0.500	0.200						
Medium	0.700	0.500	0.300						
Small	0.550	0.500	0.450						
Response Mean and Standard Deviation in									
Home	oskedastic Norn	nal Outcome S	cenario						
	High	Medium	Low						
	Class	Class	Class						
Effect Size	Scenario								
Large	0.30 (1.00)	0.00 (1.00)	-0.30 (1.00)						
Medium	0.20 (1.00)	0.00 (1.00)	-0.20 (1.00)						
Small	0.10 (1.00)	0.00 (1.00)	-0.10 (1.00)						
Respo	onse Mean and	Standard Devi	ation in						
Heter	oskedastic Norr	nal Outcome S	Scenario						
	High	Medium	Low						
	Class	Class	Class						
Effect Size	Scenario								
Large	0.60 (3.00)	0.00 (1.00)	-0.60 (1.00)						
Medium	0.40 (3.00)	0.00 (1.00)	-0.40 (1.00)						
Small	0.20 (3.00)	0.00 (1.00)	-0.20 (1.00)						
Resp	onse Mean and	Standard Devi	ation in						
Exp	onential Skewe	d Outcome Sc	enario						
	High	Medium	Low						
	Class	Class	Class						
Effect Size	Scenario								
Large	1.80 (1.80)	1.40 (1.40)	1.00 (1.00)						
Medium	1.50 (1.50)	1.25 (1.25)	1.00 (1.00)						
~ 11	1 00 (1 00)	4 40 (4 40)							

Small

1.20 (1.20)

1.10 (1.10)

1.00 (1.00)

Table A2

Mean Absolute Bias Across Classes for Binary Outcome Probabilities

		Low Measurement Quality (Ramaswamy Entropy ≈.7)						
Class Proport	tions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large	
Unadjusted	Modal	0.004	0.014	0.020	0.005	0.019	0.030	
	Proportional	0.006	0.020	0.029	0.008	0.031	0.047	
ML	Modal	0.001	0.002	0.001	0.002	0.002	0.005	
	Proportional	0.001	0.001	0.001	0.002	0.002	0.004	
BCH	Modal	0.001	0.002	0.001	0.002	0.002	0.004	
	Proportional	0.001	0.001	0.001	0.002	0.002	0.003	
Inclusive	Modal	0.001	0.005	0.007	0.003	0.009	0.012	
	Proportional	0.001	0.001	0.001	0.002	0.001	0.002	
Oracle		0.001	0.000	0.001	0.001	0.001	0.000	
	-	High Me	asurement Qu	ıality (Raı	maswamy Er	tropy ≈.85	)	
Class Proport	tions	Even			Uneven			
Effect Size		Small	Medium	Large	Small	Medium	Large	
Unadjusted	Modal	0.002	0.009	0.012	0.004	0.012	0.018	
	Proportional	0.002	0.012	0.018	0.005	0.018	0.028	
ML	Modal	0.001	0.001	0.001	0.001	0.001	0.002	
	Proportional	0.001	0.001	0.001	0.001	0.001	0.002	
BCH	Modal	0.001	0.001	0.001	0.001	0.001	0.002	
	Proportional	0.001	0.001	0.001	0.001	0.001	0.002	
Inclusive	Modal	0.002	0.002	0.003	0.000	0.004	0.006	
	Proportional	0.001	0.001	0.001	0.001	0.001	0.001	
Oracle		0.001	0.000	0.000	0.001	0.000	0.000	

Table A3

Root Mean Squared Error Across Classes for Binary Outcome
Probabilities

Trobubilities							
		Low Me	asurement Q	uality (R	amaswan	ny Entro <mark>py</mark>	≈.73) <sup>—</sup>
Class Proportion	ons		Even			Uneven	
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.028	0.032	0.036	0.036	0.043	0.048
	Proportional	0.026	0.034	0.043	0.032	0.047	0.060
ML	Modal	0.033	0.032	0.031	0.043	0.044	0.041
	Proportional	0.032	0.030	0.030	0.041	0.042	0.039
BCH	Modal	0.033	0.032	0.031	0.043	0.044	0.041
	Proportional	0.032	0.030	0.030	0.041	0.042	0.039
Inclusive	Modal	0.035	0.034	0.033	0.047	0.048	0.044
	Proportional	0.032	0.031	0.030	0.042	0.043	0.039
Oracle		0.027	0.026	0.024	0.036	0.034	0.030
		High Me	easurement (	Quality (R	amaswai	ny Entropy	≈.84)
Class Proportion	ons		Even			Uneven	
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.027	0.029	0.029	0.035	0.035	0.037
	Proportional	0.026	0.029	0.032	0.033	0.036	0.042
ML	Modal	0.030	0.029	0.027	0.039	0.036	0.034
	Proportional	0.029	0.028	0.027	0.038	0.035	0.034
BCH	Modal	0.030	0.029	0.027	0.039	0.036	0.034
	Proportional	0.029	0.028	0.027	0.038	0.035	0.034
Inclusive	Modal	0.030	0.030	0.028	0.040	0.038	0.035
	Proportional	0.029	0.029	0.027	0.038	0.036	0.034
Oracle		0.027	0.026	0.024	0.035	0.032	0.029

Table A4

Mean Confidence Interval Coverage Across Classes for Binary Outcome Probabilities

Mean Confidence Interval Coverage Across Classes for Binary Outcome Probabilities								
		Low Me	asurement Ç	Quality (R	Ramaswai	my Entropy?	≈.73)	
Class Proporti	ons		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large	
Unadjusted	Modal	0.939	0.900	0.814	0.945	0.886	0.795	
	Proportional	0.960	0.874	0.684	0.965	0.844	0.644	
ML	Modal	0.946	0.938	0.936	0.946	0.937	0.932	
	Proportional	0.947	0.940	0.933	0.949	0.937	0.930	
BCH	Modal	0.946	0.939	0.936	0.946	0.937	0.933	
	Proportional	0.947	0.940	0.933	0.949	0.936	0.930	
Inclusive	Modal	0.880	0.862	0.823	0.882	0.846	0.820	
	Proportional	0.908	0.893	0.882	0.905	0.883	0.877	
Oracle		0.952	0.944	0.950	0.943	0.945	0.949	
		High Mo	easurement (	Quality (I	Ramaswa	my Entropy	≈.84)	
Class Proporti	ons		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large	
Unadjusted	Modal	0.951	0.928	0.902	0.949	0.939	0.905	
	Proportional	0.962	0.924	0.868	0.960	0.935	0.866	
ML	Modal	0.953	0.945	0.944	0.949	0.951	0.943	
	Proportional	0.951	0.944	0.943	0.948	0.953	0.946	
BCH	Modal	0.953	0.945	0.945	0.949	0.951	0.943	
	Proportional	0.950	0.944	0.943	0.948	0.953	0.945	
Inclusive	Modal	0.923	0.914	0.897	0.916	0.918	0.907	
	Proportional	0.933	0.925	0.918	0.931	0.933	0.925	
Oracle		0.952	0.943	0.946	0.950	0.955	0.958	

Table A5

Mean Absolute Bias Across Classes for Homoskedastic Normal Outcome Means

		Low I	Low Measurement Quality (Ramaswamy Entropy					
Class Proporti	ons		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large	
Unadjusted	Modal	0.006	0.013	0.020	0.009	0.020	0.029	
	Proportional	0.009	0.019	0.029	0.015	0.031	0.047	
ML	Modal	0.002	0.001	0.001	0.003	0.003	0.003	
	Proportional	0.003	0.002	0.001	0.002	0.002	0.003	
BCH	Modal	0.002	0.001	0.001	0.003	0.003	0.003	
	Proportional	0.002	0.001	0.001	0.003	0.003	0.003	
Inclusive	Modal	0.005	0.006	0.008	0.005	0.010	0.015	
	Proportional	0.002	0.003	0.001	0.002	0.002	0.001	
Quadratic	Modal	0.005	0.006	0.008	0.005	0.010	0.015	
	Proportional	0.002	0.003	0.001	0.002	0.003	0.001	
Oracle		0.002	0.002	0.001	0.002	0.001	0.001	
		High M	[easurement	Quality (	Ramaswa	amy Entropy	<sup>'</sup> ≈.84)	
Class Proporti	ons	Even				Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large	
Unadjusted	Modal	0.004	0.009	0.012	0.006	0.012	0.018	
	Proportional	0.006	0.012	0.017	0.010	0.019	0.028	
ML	Modal	0.003	0.001	0.001	0.002	0.002	0.004	
	Proportional	0.002	0.001	0.000	0.002	0.001	0.003	
BCH	Modal	0.003	0.001	0.001	0.002	0.002	0.004	
	Proportional	0.003	0.001	0.001	0.002	0.002	0.004	
Inclusive	Modal	0.004	0.002	0.003	0.002	0.004	0.006	
	Proportional	0.002	0.001	0.000	0.002	0.002	0.002	
Quadratic	Modal	0.004	0.002	0.003	0.002	0.004	0.006	
	Proportional	0.002	0.001	0.000	0.002	0.002	0.002	
Oracle		0.002	0.001	0.000	0.002	0.001	0.003	

Table A6

Root Mean Squared Error Across Classes for Homoskedastic Normal Outcome Means

Root Mean Squared Error Across Classes for Homoskedastic Normal Outcome Means							
		Low M	easurement (	Quality (F	Ramaswa	my Entropy	≈.73)
Class Proporti	ons		Even			Uneven	
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.055	0.057	0.060	0.074	0.079	0.081
	Proportional	0.050	0.055	0.061	0.065	0.073	0.082
ML	Modal	0.065	0.065	0.064	0.087	0.090	0.088
	Proportional	0.063	0.063	0.062	0.083	0.085	0.085
BCH	Modal	0.065	0.065	0.064	0.087	0.090	0.088
	Proportional	0.065	0.065	0.064	0.087	0.090	0.088
Inclusive	Modal	0.069	0.069	0.068	0.094	0.099	0.097
	Proportional	0.064	0.063	0.062	0.085	0.087	0.086
Quadratic	Modal	0.069	0.069	0.068	0.094	0.099	0.097
	Proportional	0.064	0.063	0.063	0.085	0.088	0.086
Oracle		0.053	0.055	0.054	0.071	0.073	0.071
		High M	leasurement (	Quality (l	Ramaswa	ımy Entropy	≈.84)
Class Proporti	ons	Even				Uneven	
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.055	0.056	0.058	0.072	0.074	0.075
	Proportional	0.052	0.054	0.056	0.067	0.070	0.073
ML	Modal	0.060	0.060	0.061	0.079	0.079	0.079
	Proportional	0.059	0.059	0.060	0.077	0.078	0.077
BCH	Modal	0.060	0.060	0.061	0.079	0.079	0.079
	Proportional	0.060	0.060	0.061	0.079	0.079	0.079
Inclusive	Modal	0.061	0.061	0.062	0.082	0.083	0.082
	Proportional	0.059	0.059	0.060	0.078	0.079	0.078
Quadratic	Modal	0.061	0.062	0.062	0.082	0.083	0.082
	Proportional	0.059	0.059	0.060	0.078	0.079	0.078
Oracle		0.055	0.055	0.055	0.072	0.071	0.071

Table A7

Mean Confidence Interval Coverage Across Classes for Homoskedastic Normal Outcome
Means

Means		Low Measurement Quality (Ramaswamy Entropy ≈.73)					≈.73)
Class Proportion	ons		Even			Uneven	
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.952	0.938	0.928	0.954	0.932	0.923
	Proportional	0.965	0.947	0.927	0.971	0.945	0.917
ML	Modal	0.953	0.946	0.953	0.955	0.943	0.945
	Proportional	0.951	0.946	0.951	0.959	0.943	0.946
BCH	Modal	0.953	0.948	0.954	0.955	0.944	0.946
	Proportional	0.953	0.948	0.954	0.955	0.944	0.946
Inclusive	Modal	0.885	0.875	0.887	0.885	0.872	0.864
	Proportional	0.906	0.903	0.912	0.916	0.902	0.903
Quadratic	Modal	0.879	0.875	0.882	0.882	0.868	0.861
	Proportional	0.905	0.906	0.913	0.911	0.901	0.903
Oracle		0.954	0.946	0.955	0.952	0.947	0.949
		High M	easurement (	Quality (1	Ramaswa	my Entropy	≈.84)
Class Proportion	ons	Even				Uneven	
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.949	0.946	0.933	0.951	0.941	0.939
	Proportional	0.962	0.957	0.942	0.961	0.949	0.939
ML	Modal	0.949	0.949	0.940	0.951	0.947	0.947
	Proportional	0.949	0.949	0.944	0.953	0.945	0.948
BCH	Modal	0.950	0.948	0.940	0.951	0.947	0.947
	Proportional	0.950	0.948	0.940	0.951	0.947	0.947
Inclusive	Modal	0.919	0.915	0.914	0.924	0.913	0.915
	Proportional	0.927	0.927	0.925	0.933	0.923	0.931
Quadratic	Modal	0.915	0.910	0.915	0.921	0.913	0.916
	Proportional	0.927	0.926	0.926	0.932	0.921	0.931
Oracle		0.952	0.949	0.945	0.950	0.950	0.948

Table A8

Mean Absolute Bias Across Classes for Heteroskedastic Normal Outcome Means

Mean Absolute Bias Across Classes for Heteroskedastic Normal Outcome Means							
		Low M	easurement (	Quality (l	Ramaswa	amy Entropy	≈.73)
Class Proporti	ons		Even			Uneven	
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.014	0.031	0.040	0.015	0.040	0.059
	Proportional	0.019	0.042	0.057	0.027	0.064	0.093
ML	Modal	0.125	0.246	0.367	0.111	0.228	0.338
	Proportional	0.096	0.195	0.307	0.390	0.615	0.724
BCH	Modal	0.002	0.006	0.001	0.003	0.006	0.008
	Proportional	0.002	0.006	0.001	0.003	0.006	0.008
Inclusive	Modal	0.281	0.532	0.487	0.059	0.127	0.153
	Proportional	0.273	0.515	0.475	0.052	0.113	0.134
Quadratic	Modal	0.007	0.009	0.015	0.015	0.016	0.027
	Proportional	0.001	0.003	0.002	0.005	0.002	0.002
Oracle		0.001	0.003	0.002	0.005	0.001	0.003
		High M	leasurement	Quality (	Ramaswa	amy Entropy	<sup>7</sup> ≈.84)
Class Proporti	ons		Even			Uneven	
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.012	0.014	0.025	0.006	0.026	0.036
	Proportional	0.016	0.022	0.035	0.014	0.040	0.056
ML	Modal	0.126	0.251	0.369	0.114	0.229	0.365
	Proportional	0.030	0.074	0.113	0.327	0.508	0.625
BCH	Modal	0.005	0.003	0.003	0.005	0.005	0.004
	Proportional	0.005	0.003	0.003	0.005	0.005	0.004
Inclusive	Modal	0.011	0.028	0.036	0.047	0.057	0.069
	Proportional	0.012	0.032	0.041	0.044	0.056	0.068
Quadratic	Modal	0.004	0.007	0.006	0.010	0.004	0.010
	Proportional	0.005	0.003	0.001	0.006	0.004	0.003
Oracle		0.005	0.003	0.000	0.006	0.005	0.002

Table A9

Root Mean Sauared Error Across Classes for Heteroskedastic Normal Outcome Means

Root Mean Squared Error Across Classes for Heteroskedastic Normal Outcome Means						S			
		Low M	easurement (	Quality (F	Ramaswa	my Entropy	≈.73)		
Class Proportion	ons		Even			Uneven			
Effect Size		Small	Medium	Large	Small	Medium	Large		
Unadjusted	Modal	0.106	0.112	0.120	0.180	0.180	0.190		
	Proportional	0.099	0.110	0.123	0.157	0.167	0.184		
ML	Modal	0.192	0.356	0.519	0.356	0.466	0.595		
	Proportional	0.203	0.285	0.392	1.182	1.138	1.118		
BCH	Modal	0.121	0.123	0.126	0.209	0.204	0.210		
	Proportional	0.121	0.123	0.126	0.209	0.204	0.210		
Inclusive	Modal	1.633	1.688	1.600	1.334	1.191	1.041		
	Proportional	1.552	1.605	1.524	1.251	1.112	0.970		
Quadratic	Modal	0.112	0.114	0.119	0.204	0.205	0.209		
	Proportional	0.108	0.110	0.115	0.190	0.190	0.193		
Oracle		0.104	0.106	0.109	0.180	0.183	0.183		
		High M	High Measurement Quality (Ramaswamy Entropy ≈.84)						
Class Proportion	ons	Even				Uneven			
Effect Size		Small	Medium	Large	Small	Medium	Large		
Unadjusted	Modal	0.103	0.106	0.110	0.175	0.185	0.187		
	Proportional	0.099	0.102	0.109	0.164	0.174	0.180		
ML	Modal	0.206	0.372	0.510	0.274	0.414	0.559		
	Proportional	0.122	0.147	0.180	0.999	0.984	1.031		
BCH	Modal	0.110	0.112	0.113	0.191	0.199	0.200		
	Proportional	0.110	0.112	0.113	0.191	0.199	0.200		
Inclusive	Modal	0.115	0.121	0.126	0.343	0.338	0.308		
	Proportional	0.112	0.118	0.124	0.324	0.319	0.291		
Quadratic	Modal	0.107	0.109	0.110	0.191	0.198	0.199		
	Proportional	0.105	0.107	0.108	0.185	0.192	0.192		
Oracle		0.102	0.104	0.105	0.182	0.187	0.189		

Table A10

Mean Confidence Interval Coverage Across Classes for Heteroskedastic Normal Outcome
Means

		Low Measurement Quality (Ramaswamy Entropy ≈.73)					
Class Proporti	ons		Even			Uneven	
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.945	0.917	0.886	0.946	0.915	0.870
	Proportional	0.959	0.919	0.855	0.957	0.905	0.823
ML	Modal	0.473	0.223	0.174	0.478	0.269	0.206
	Proportional	0.871	0.630	0.366	0.260	0.220	0.207
BCH	Modal	0.951	0.947	0.945	0.951	0.956	0.940
	Proportional	0.951	0.947	0.945	0.951	0.956	0.940
Inclusive	Modal	0.362	0.276	0.298	0.484	0.502	0.558
	Proportional	0.378	0.274	0.295	0.487	0.500	0.538
Quadratic	Modal	0.898	0.888	0.878	0.902	0.899	0.876
	Proportional	0.922	0.918	0.905	0.919	0.918	0.914
Oracle		0.955	0.950	0.951	0.956	0.950	0.951
	High Measurement Quality (Ram						
		High M	easurement (	Quality (1	Ramaswa	ımy Entropy	≈.84)
Class Proporti	ons	High M	leasurement ( Even	Quality (l	Ramaswa	amy Entropy Uneven	≈.84)
Class Proportion	ons	High M Small		Quality (l Large	Ramaswa Small		≈.84) Large
-	ons Modal		Even			Uneven	·
Effect Size		Small	Even Medium	Large	Small	Uneven Medium	Large
Effect Size	Modal	Small 0.949	Even Medium 0.937	Large 0.935	Small 0.954	Uneven Medium 0.939	Large 0.923
Effect Size Unadjusted	Modal Proportional	Small 0.949 0.959	Even Medium 0.937 0.947	Large 0.935 0.926	Small 0.954 0.958	Uneven Medium 0.939 0.942	Large 0.923 0.903
Effect Size Unadjusted	Modal Proportional Modal	Small 0.949 0.959 0.428	Even Medium 0.937 0.947 0.230	Large 0.935 0.926 0.212	Small 0.954 0.958 0.475	Uneven Medium 0.939 0.942 0.328	Large 0.923 0.903 0.213
Effect Size Unadjusted ML	Modal Proportional Modal Proportional	Small 0.949 0.959 0.428 0.929	Even Medium 0.937 0.947 0.230 0.846	Large 0.935 0.926 0.212 0.726	Small 0.954 0.958 0.475 0.485	Uneven Medium 0.939 0.942 0.328 0.424	Large 0.923 0.903 0.213 0.355
Effect Size Unadjusted ML	Modal Proportional Modal Proportional Modal	Small 0.949 0.959 0.428 0.929 0.953	Even Medium 0.937 0.947 0.230 0.846 0.948	Large 0.935 0.926 0.212 0.726 0.952	Small 0.954 0.958 0.475 0.485 0.955	Uneven Medium 0.939 0.942 0.328 0.424 0.954	Large 0.923 0.903 0.213 0.355 0.945
Effect Size Unadjusted ML BCH	Modal Proportional Modal Proportional Modal Proportional	Small 0.949 0.959 0.428 0.929 0.953 0.953	Even Medium 0.937 0.947 0.230 0.846 0.948 0.948	Large 0.935 0.926 0.212 0.726 0.952	Small 0.954 0.958 0.475 0.485 0.955 0.955	Uneven Medium 0.939 0.942 0.328 0.424 0.954 0.954	Large 0.923 0.903 0.213 0.355 0.945 0.945
Effect Size Unadjusted ML BCH	Modal Proportional Modal Proportional Modal Proportional Modal Modal	Small 0.949 0.959 0.428 0.929 0.953 0.953 0.926	Even Medium 0.937 0.947 0.230 0.846 0.948 0.948 0.902	Large 0.935 0.926 0.212 0.726 0.952 0.952 0.894	Small 0.954 0.958 0.475 0.485 0.955 0.955 0.836	Uneven Medium 0.939 0.942 0.328 0.424 0.954 0.954 0.843	Large 0.923 0.903 0.213 0.355 0.945 0.945 0.846
Effect Size Unadjusted ML BCH Inclusive	Modal Proportional Modal Proportional Modal Proportional Modal Proportional	Small 0.949 0.959 0.428 0.929 0.953 0.953 0.953 0.926 0.939	Even Medium 0.937 0.947 0.230 0.846 0.948 0.948 0.902 0.914	Large 0.935 0.926 0.212 0.726 0.952 0.952 0.894 0.889	Small 0.954 0.958 0.475 0.485 0.955 0.955 0.836 0.844	Uneven Medium  0.939 0.942 0.328 0.424 0.954 0.954 0.843 0.848	Large 0.923 0.903 0.213 0.355 0.945 0.945 0.846 0.843

Table A11

Mean Absolute Bias Across Classes for Exponential Skewed Outcome Means

Mean Absolute Bias Across Classes for Exponential Skewed Outcome Means							
		Low M	easurement (	Quality (1	Ramaswa	ımy Entropy	≈.73)
Class Proporti	ons		Even			Uneven	
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.007	0.017	0.028	0.011	0.025	0.040
	Proportional	0.010	0.025	0.039	0.016	0.040	0.063
ML	Modal	0.002	0.017	0.044	0.009	0.104	0.329
	Proportional	0.005	0.033	0.077	0.049	0.347	0.767
BCH	Modal	0.002	0.002	0.003	0.003	0.005	0.008
	Proportional	0.002	0.002	0.003	0.003	0.005	0.008
Inclusive	Modal	0.003	0.007	0.009	0.004	0.011	0.018
	Proportional	0.002	0.003	0.003	0.001	0.003	0.006
Quadratic	Modal	0.003	0.006	0.008	0.005	0.010	0.019
	Proportional	0.002	0.003	0.002	0.002	0.003	0.006
Oracle		0.001	0.002	0.002	0.002	0.003	0.003
		High Measurement Quality (Ramaswamy Entropy					<sup>7</sup> ≈.84)
Class Proporti	ons		Even			Uneven	
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.005	0.009	0.015	0.005	0.013	0.023
	Proportional	0.007	0.013	0.023	0.008	0.021	0.036
ML	Modal	0.002	0.011	0.021	0.004	0.027	0.083
	Proportional	0.003	0.017	0.034	0.008	0.070	0.276
BCH	Modal	0.002	0.002	0.001	0.000	0.002	0.003
	Proportional	0.002	0.002	0.001	0.000	0.002	0.003
Inclusive	Modal	0.002	0.004	0.004	0.003	0.008	0.010
	Proportional	0.002	0.002	0.001	0.001	0.003	0.003
Quadratic	Modal	0.002	0.004	0.004	0.003	0.008	0.009
	Proportional	0.002	0.002	0.001	0.001	0.003	0.002
Oracle		0.002	0.002	0.001	0.002	0.003	0.003

Table A12

Root Mean Sauared Error Across Classes for Exponential Skewed Outcome Means

Root Mean Sq	Root Mean Squared Error Across Classes for Exponential Skewed Outcome Means						
		Low M	easurement (	Quality (I	Ramaswa	ımy Entropy	≈.73)
Class Proporti	ons		Even			Uneven	
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.061	0.074	0.088	0.083	0.103	0.127
	Proportional	0.056	0.070	0.087	0.074	0.097	0.123
ML	Modal	0.072	0.086	0.105	0.123	0.435	0.841
	Proportional	0.070	0.089	0.121	0.318	0.912	1.413
BCH	Modal	0.072	0.084	0.096	0.098	0.118	0.141
	Proportional	0.072	0.084	0.096	0.098	0.118	0.141
Inclusive	Modal	0.076	0.088	0.098	0.107	0.130	0.154
	Proportional	0.070	0.081	0.091	0.097	0.116	0.136
Quadratic	Modal	0.075	0.088	0.098	0.107	0.131	0.152
	Proportional	0.070	0.081	0.092	0.097	0.117	0.136
Oracle		0.060	0.070	0.077	0.083	0.100	0.117
		High M	High Measurement Quality (Ramaswamy Entropy ≈.84				
Class Proporti	ons		Even			Uneven	
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.060	0.072	0.083	0.083	0.104	0.121
	Proportional	0.057	0.069	0.081	0.077	0.097	0.115
ML	Modal	0.065	0.078	0.091	0.099	0.161	0.294
	Proportional	0.064	0.078	0.094	0.105	0.314	0.744
BCH	Modal	0.065	0.077	0.088	0.091	0.114	0.130
	Proportional	0.065	0.077	0.088	0.091	0.114	0.130
Inclusive	Modal	0.067	0.078	0.089	0.095	0.120	0.135
	Proportional	0.064	0.076	0.086	0.090	0.112	0.127
Quadratic	Modal	0.067	0.078	0.089	0.094	0.121	0.135
	Proportional	0.064	0.076	0.086	0.090	0.113	0.127
Oracle		0.059	0.071	0.079	0.082	0.102	0.117

Table A13

Mean Confidence Interval Coverage Across Classes for Exponential Skewed Outcome Means

		Low M	easurement (	Quality (F	Ramaswa	my Entropy	≈.73)
Class Proportions		Even			Uneven		
Effect Size		Small	Medium	Large	Small	Medium	Large
Unadjusted	Modal	0.944	0.929	0.914	0.938	0.928	0.903
	Proportional	0.966	0.941	0.914	0.957	0.930	0.891
ML	Modal	0.944	0.932	0.891	0.936	0.896	0.764
	Proportional	0.945	0.908	0.800	0.912	0.726	0.472
BCH	Modal	0.946	0.945	0.939	0.942	0.940	0.937
	Proportional	0.946	0.945	0.939	0.942	0.940	0.937
Inclusive	Modal	0.876	0.873	0.874	0.875	0.874	0.872
	Proportional	0.906	0.902	0.903	0.907	0.902	0.904
Quadratic	Modal	0.876	0.874	0.868	0.880	0.868	0.871
	Proportional	0.902	0.901	0.896	0.903	0.895	0.901
Oracle		0.947	0.949	0.955	0.942	0.941	0.942
		High Measurement Quality (Ramaswamy Entropy ≈.84)					
Class Proportions		Even			Uneven		
	OHS		Lven			Uneven	
Effect Size	Olls	Small	Medium	Large	Small	Medium	Large
Effect Size Unadjusted	Modal	Small 0.942		Large 0.938	Small 0.942		Large 0.928
			Medium			Medium	
	Modal	0.942	Medium 0.942	0.938	0.942	Medium 0.933	0.928
Unadjusted	Modal Proportional	0.942 0.955	Medium 0.942 0.953	0.938 0.946	0.942 0.961	Medium 0.933 0.949	0.928 0.932
Unadjusted	Modal Proportional Modal	0.942 0.955 0.943	Medium 0.942 0.953 0.938	0.938 0.946 0.934	0.942 0.961 0.944	Medium 0.933 0.949 0.932	0.928 0.932 0.921
Unadjusted ML	Modal Proportional Modal Proportional	0.942 0.955 0.943 0.942	Medium  0.942 0.953 0.938 0.936	0.938 0.946 0.934 0.915	0.942 0.961 0.944 0.942	Medium 0.933 0.949 0.932 0.924	0.928 0.932 0.921 0.814
Unadjusted ML	Modal Proportional Modal Proportional Modal	0.942 0.955 0.943 0.942 0.945	Medium  0.942 0.953 0.938 0.936 0.943	0.938 0.946 0.934 0.915 0.943	0.942 0.961 0.944 0.942 0.948	Medium  0.933 0.949 0.932 0.924 0.940	0.928 0.932 0.921 0.814 0.939
Unadjusted ML BCH	Modal Proportional Modal Proportional Modal Proportional	0.942 0.955 0.943 0.942 0.945	Medium  0.942 0.953 0.938 0.936 0.943 0.943	0.938 0.946 0.934 0.915 0.943	0.942 0.961 0.944 0.942 0.948 0.948	Medium  0.933 0.949 0.932 0.924 0.940 0.940	0.928 0.932 0.921 0.814 0.939 0.939
Unadjusted ML BCH	Modal Proportional Modal Proportional Modal Proportional Modal Modal	0.942 0.955 0.943 0.942 0.945 0.945	Medium  0.942 0.953 0.938 0.936 0.943 0.943 0.908	0.938 0.946 0.934 0.915 0.943 0.943 0.910	0.942 0.961 0.944 0.942 0.948 0.948 0.908	Medium  0.933 0.949 0.932 0.924 0.940 0.940 0.909	0.928 0.932 0.921 0.814 0.939 0.939 0.910
Unadjusted ML BCH Inclusive	Modal Proportional Modal Proportional Modal Proportional Modal Proportional	0.942 0.955 0.943 0.942 0.945 0.945 0.918	Medium  0.942 0.953 0.938 0.936 0.943 0.943 0.908 0.920	0.938 0.946 0.934 0.915 0.943 0.943 0.910 0.926	0.942 0.961 0.944 0.942 0.948 0.948 0.908 0.924	Medium  0.933 0.949 0.932 0.924 0.940 0.940 0.909 0.924	0.928 0.932 0.921 0.814 0.939 0.939 0.910 0.925