Supplementary Material to: "Area Under the ROC Curve Estimation based on Ranked Set Sampling via Genetic Algorithm"

Supplementary table for the numerical results corresponding to graphical representations provided as Figures 3 and 4 in Section 4:

Table S1. Simulated $bias$ and MSE values for the estimators of AUC; $(\mu_y, \sigma_y) = (0,1), b_x = b_y = b$.

		RSS					SRS			
		$\widehat{AUC}_{ML}$		$\widehat{AUC}_{ML-GA}$			$\widehat{AUC}^*_{ML}$		$\widehat{AUC}^*_{ML-GA}$	
	(m_x, m_y)	*bias*	*MSE*	*bias*	*MSE*	(n_x, n_y)	*bias*	*MSE*	*bias*	*MSE*
$b = 0.5, (\mu_x, \sigma_x) = (0,1), AUC = 0.5$										
$r = 5$	(3,3)	0.0006	0.0058	0.0023	0.0057	(15,15)	-0.0004	0.0118	0.0011	0.0111
	(3,5)	0.0004	0.0041	-0.0017	0.0039	(15,25)	0.0012	0.0090	-0.0008	0.0080
	(5,5)	-0.0003	0.0022	0.0000	0.0022	(25,25)	0.0007	0.0067	-0.0014	0.0061
$r = 10$	(3,3)	0.0011	0.0029	-0.0007	0.0028	(30,30)	-0.0004	0.0056	-0.0038	0.0052
	(3,5)	-0.0006	0.0020	-0.0018	0.0019	(30,50)	0.0005	0.0045	0.0009	0.0042
	(5,5)	0.0004	0.0011	0.0008	0.0010	(50,50)	0.0001	0.0034	0.0008	0.0029
$b = 1, (\mu_x, \sigma_x) = (0,1), AUC = 0.5$										
$r = 5$	(3,3)	-0.0005	0.0059	0.0000	0.0058	(15,15)	0.0005	0.0117	-0.0005	0.0110
	(3,5)	-0.0009	0.0041	-0.0008	0.0038	(15,25)	0.0013	0.0089	-0.0010	0.0089
	(5,5)	0.0007	0.0023	-0.0015	0.0022	(25,25)	-0.0003	0.0069	0.0012	0.0063
$r = 10$	(3,3)	0.0001	0.0029	0.0018	0.0029	(30,30)	-0.0004	0.0056	0.0017	0.0050
	(3,5)	0.0007	0.0020	-0.0013	0.0019	(30,50)	-0.0001	0.0044	0.0006	0.0041
	(5,5)	-0.0004	0.0012	-0.0000	0.0010	(50,50)	0.0002	0.0033	0.0002	0.0029
$b = 4, (\mu_x, \sigma_x) = (0,1), AUC = 0.5$										
$r = 5$	(3,3)	0.0005	0.0059	0.0017	0.0057	(15,15)	-0.0021	0.0119	-0.0028	0.0121
	(3,5)	-0.0000	0.0041	-0.0021	0.0039	(15,25)	0.0018	0.0093	0.0017	0.0087
	(5,5)	-0.0001	0.0022	-0.0010	0.0024	(25,25)	-0.0008	0.0068	-0.0004	0.0067
$r = 10$	(3,3)	0.0006	0.0029	0.0003	0.0027	(30,30)	0.0005	0.0056	-0.0029	0.0053
	(3,5)	0.0005	0.0020	-0.0001	0.0018	(30,50)	0.0003	0.0044	-0.0056	0.0041
	(5,5)	-0.0001	0.0011	-0.0008	0.0012	(50,50)	-0.0002	0.0033	-0.0020	0.0030
$b = 0.5, (\mu_x, \sigma_x) = (1.70,1), AUC = 0.7$										
$r = 5$	(3,3)	0.0037	0.0048	-0.0007	0.0046	(15,15)	0.0006	0.0091	0.0033	0.0086
	(3,5)	0.0036	0.0036	0.0047	0.0035	(15,25)	0.0022	0.0074	0.0021	0.0071
	(5,5)	0.0020	0.0019	0.0005	0.0020	(25,25)	0.0002	0.0054	-0.0007	0.0049
$r = 10$	(3,3)	0.0017	0.0024	0.0022	0.0022	(30,30)	0.0005	0.0044	0.0016	0.0040
	(3,5)	0.0014	0.0018	0.0014	0.0017	(30,50)	0.0014	0.0036	0.0022	0.0031
	(5,5)	0.0009	0.0010	0.0021	0.0009	(50,50)	0.0012	0.0026	0.0003	0.0024
$b = 0.5, (\mu_x, \sigma_x) = (3.75,2), AUC = 0.7$										
$r = 5$	(3,3)	0.0047	0.0050	0.0042	0.0049	(15,15)	0.0037	0.0093	0.0020	0.0080
	(3,5)	0.0049	0.0047	0.0067	0.0044	(15,25)	0.0029	0.0089	0.0038	0.0083
	(5,3)	0.0019	0.0026	0.0018	0.0024	(25,15)	0.0030	0.0061	0.0004	0.0056
	(5,5)	0.0024	0.0021	0.0020	0.0020	(25,25)	0.0018	0.0055	0.0063	0.0049
r=10	(3,3)	0.0022	0.0024	0.0022	0.0023	(30,30)	0.0015	0.0046	0.0009	0.0045
	(3,5)	0.0022	0.0023	0.0015	0.0020	(30,50)	0.0016	0.0042	0.0022	0.0042
	(5,3)	0.0013	0.0012	0.0025	0.0012	(50,30)	0.0004	0.0029	0.0006	0.0027
	(5,5)	0.0016	0.0010	0.0020	0.0010	(50,50)	0.0019	0.0028	-0.0008	0.0023

Table S1. Continued.

		RSS					SRS			
		$\widehat{AUC}_{ML}$		$\widehat{AUC}_{ML-GA}$			$\widehat{AUC}^{*}_{ML}$		$\widehat{AUC}^{*}_{ML-GA}$	
	(m_x, m_y)	*bias*	*MSE*	*bias*	*MSE*	(n_x, n_y)	*bias*	*MSE*	*bias*	*MSE*
$b = 1, (\mu_x, \sigma_x) = (1.27,1), AUC = 0.7$										
$r = 5$	(3,3)	0.0036	0.0048	0.0037	0.0042	(15,15)	0.0005	0.0090	0.0015	0.0077
	(3,5)	0.0025	0.0035	0.0054	0.0034	(15,25)	0.0017	0.0074	-0.0006	0.0063
	(5,5)	0.0018	0.0020	0.0020	0.0019	(25,25)	0.0001	0.0053	0.0008	0.0047
$r = 10$	(3,3)	0.0014	0.0024	0.0019	0.0022	(30,30)	0.0012	0.0044	0.0003	0.0040
	(3,5)	0.0013	0.0017	0.0017	0.0016	(30,50)	0.0010	0.0035	-0.0003	0.0031
	(5,5)	0.0013	0.0010	0.0008	0.0009	(50,50)	0.0006	0.0026	0.0014	0.0024
$b = 1, (\mu_x, \sigma_x) = (1.97,2), AUC = 0.7$										
$r = 5$	(3,3)	0.0042	0.0051	0.0029	0.0048	(15,15)	0.0026	0.0094	-0.0035	0.0091
	(3,5)	0.0037	0.0045	0.0024	0.0044	(15,25)	0.0044	0.0084	0.0050	0.0082
	(5,3)	0.0029	0.0026	0.0019	0.0023	(25,15)	0.0020	0.0063	0.0028	0.0060
	(5,5)	0.0021	0.0021	0.0040	0.0020	(25,25)	0.0014	0.0057	-0.0008	0.0054
$r = 10$	(3,3)	0.0023	0.0025	0.0046	0.0025	(30,30)	0.0014	0.0047	0.0016	0.0042
	(3,5)	0.0020	0.0023	0.0050	0.0021	(30,50)	0.0021	0.0044	0.0007	0.0036
	(5,3)	0.0012	0.0013	0.0008	0.0012	(50,30)	0.0014	0.0030	0.0006	0.0028
	(5,5)	0.0013	0.0010	0.0016	0.0010	(50,50)	0.0004	0.0028	0.0010	0.0026
$b = 4, (\mu_x, \sigma_x) = (0.95,1), AUC = 0.7$										
$r = 5$	(3,3)	0.0042	0.0049	0.0052	0.0048	(15,15)	0.0023	0.0088	0.0062	0.0085
	(3,5)	0.0030	0.0030	0.0048	0.0029	(15,25)	0.0029	0.0069	-0.0005	0.0067
	(5,5)	0.0018	0.0019	0.0032	0.0019	(25,25)	0.0021	0.0055	0.0048	0.0052
$r = 10$	(3,3)	0.0013	0.0024	0.0012	0.0022	(30,30)	0.0021	0.0044	-0.0009	0.0041
	(3,5)	0.0016	0.0015	0.0017	0.0016	(30,50)	0.0015	0.0033	-0.0004	0.0032
	(5,5)	0.0013	0.0010	-0.0006	0.0009	(50,50)	0.0008	0.0026	0.0021	0.0026
$b = 4, (\mu_x, \sigma_x) = (0.38,1.5), AUC = 0.7$										
$r = 5$	(3,3)	0.0047	0.0049	0.0095	0.0050	(15,15)	0.0014	0.0091	0.0037	0.0088
	(3,5)	0.0031	0.0038	0.0010	0.0036	(15,25)	0.0018	0.0077	0.0012	0.0076
	(5,3)	0.0031	0.0031	0.0024	0.0032	(25,15)	0.0015	0.0067	0.0012	0.0065
	(5,5)	0.0029	0.0020	0.0003	0.0019	(25,25)	0.0012	0.0054	0.0009	0.0047
$r = 10$	(3,3)	0.0021	0.0024	0.0007	0.0023	(30,30)	0.0023	0.0044	0.0021	0.0042
	(3,5)	0.0014	0.0018	0.0030	0.0018	(30,50)	0.0009	0.0036	0.0033	0.0037
	(5,3)	0.0018	0.0015	0.0036	0.0015	(50,30)	0.0002	0.0034	0.0002	0.0031
	(5,5)	0.0005	0.0010	0.0019	0.0009	(50,50)	0.0012	0.0026	0.0028	0.0025
$b = 0.5, (\mu_x, \sigma_x) = (4.4,1), AUC = 0.9$										
$r = 5$	(3,3)	0.0011	0.0008	-0.0004	0.0008	(15,15)	-0.0005	0.0027	-0.0009	0.0026
	(3,5)	0.0020	0.0013	0.0000	0.0013	(15,25)	0.0004	0.0023	0.0005	0.0021
	(5,5)	0.0014	0.0007	0.0006	0.0006	(25,25)	0.0001	0.0015	0.0014	0.0014
$r = 10$	(3,3)	0.0010	0.0008	0.0000	0.0008	(30,30)	-0.0002	0.0013	0.0013	0.0011
	(3,5)	0.0012	0.0007	-0.0006	0.0007	(30,50)	-0.0005	0.0011	0.0012	0.0010
	(5,5)	0.0006	0.0003	0.0014	0.0003	(50,50)	0.0003	0.0007	-0.0002	0.0007

Table S1. Continued.

		RSS					SRS			
		$\widehat{AUC}_{ML}$		$\widehat{AUC}_{ML-GA}$			$\widehat{AUC}^{*}_{ML}$		$\widehat{AUC}^{*}_{ML-GA}$	
	(m_x, m_y)	*bias*	*MSE*	*bias*	*MSE*	(n_x, n_y)	*bias*	*MSE*	*bias*	*MSE*
$b = 0.5, (\mu_x, \sigma_x) = (8.5,2), AUC = 0.9$										
$r = 5$	(3,3)	0.0032	0.0017	0.0040	0.0016	(15,15)	0.0007	0.0027	0.0027	0.0025
	(3,5)	0.0032	0.0016	0.0037	0.0016	(15,25)	0.0001	0.0028	0.0017	0.0025
	(5,3)	0.0013	0.0008	0.0027	0.0008	(25,15)	-0.0008	0.0017	0.0005	0.0016
	(5,5)	0.0017	0.0008	0.0020	0.0008	(25,25)	0.0009	0.0016	0.0011	0.0016
	(3,3)	0.0012	0.0009	-0.0000	0.0008	(30,30)	0.0002	0.0014	0.0009	0.0012
	(3,5)	0.0013	0.0008	0.0020	0.0009	(30,50)	0.0006	0.0013	-0.0002	0.0013
	(5,3)	0.0007	0.0004	0.0005	0.0004	(50,30)	0.0001	0.0008	0.0007	0.0008
	(5,5)	0.0005	0.0004	0.0000	0.0004	(50,50)	-0.0003	0.0008	0.0009	0.0007
$b = 1, (\mu_x, \sigma_x) = (3.2,1), AUC = 0.9$										
$r = 5$	(3,3)	0.0018	0.0016	0.0006	0.0015	(15,15)	-0.0002	0.0027	0.0013	0.0025
	(3,5)	0.0014	0.0012	0.0020	0.0011	(15,25)	-0.0003	0.0021	0.0023	0.0018
	(5,5)	0.0014	0.0007	0.0016	0.0007	(25,25)	-0.0006	0.0016	0.0019	0.0013
$r = 10$	(3,3)	0.0015	0.0008	0.0010	0.0008	(30,30)	-0.0008	0.0013	0.0001	0.0012
	(3,5)	0.0007	0.0006	0.0007	0.0006	(30,50)	0.0002	0.0010	-0.0011	0.0009
	(5,5)	0.0010	0.0004	0.0009	0.0004	(50,50)	0.0002	0.0008	-0.0007	0.0007
$b = 1, (\mu_x, \sigma_x) = (5,2), AUC = 0.9$										
$r = 5$	(3,3)	0.0022	0.0018	0.0031	0.0016	(15,15)	0.0012	0.0028	0.0008	0.0027
	(3,5)	0.0027	0.0016	0.0026	0.0016	(15,25)	0.0005	0.0027	-0.0011	0.0025
	(5,3)	0.0011	0.0009	0.0009	0.0009	(25,15)	0.0004	0.0019	0.0022	0.0018
	(5,5)	0.0014	0.0008	0.0007	0.0008	(25,25)	0.0006	0.0017	-0.0008	0.0016
$r = 10$	(3,3)	0.0014	0.0009	0.0008	0.0008	(30,30)	-0.0002	0.0015	-0.0007	0.0013
	(3,5)	0.0014	0.0008	0.0000	0.0008	(30,50)	0.0005	0.0013	0.0002	0.0013
	(5,3)	0.0009	0.0005	0.0013	0.0005	(50,30)	0.0007	0.0009	0.0007	0.0008
	(5,5)	0.0007	0.0004	-0.0000	0.0004	(50,50)	0.0001	0.0008	0.0010	0.0007
$b = 4, (\mu_x, \sigma_x) = (2.42,1), AUC = 0.9$										
$r = 5$	(3,3)	0.0027	0.0016	0.0027	0.0017	(15,15)	0.0003	0.0027	0.0016	0.0028
	(3,5)	0.0017	0.0010	0.0019	0.0010	(15,25)	0.0007	0.0019	0.0008	0.0018
	(5,5)	0.0021	0.0007	0.0014	0.0007	(25,25)	0.0008	0.0016	0.0010	0.0015
$r = 10$	(3,3)	0.0014	0.0008	0.0024	0.0008	(30,30)	0.0008	0.0014	0.0016	0.0013
	(3,5)	0.0010	0.0005	-0.0002	0.0005	(30,50)	0.0008	0.0009	-0.0003	0.0009
	(5,5)	0.0010	0.0004	0.0008	0.0004	(50,50)	0.0005	0.0008	0.0011	0.0008
$b = 4, (\mu_x, \sigma_x) = (1.84,2), AUC = 0.9$										
$r = 5$	(3,3)	0.0032	0.0017	0.0046	0.0016	(15,15)	0.0017	0.0028	0.0038	0.0026
	(3,5)	0.0026	0.0014	0.0004	0.0012	(15,25)	0.0010	0.0025	-0.0001	0.0025
	(5,3)	0.0020	0.0011	0.0014	0.0011	(25,15)	0.0001	0.0021	0.0008	0.0021
	(5,5)	0.0018	0.0008	0.0012	0.0008	(25,25)	0.0003	0.0017	0.0012	0.0016
$r = 10$	(3,3)	0.0017	0.0009	0.0009	0.0009	(30,30)	0.0011	0.0014	0.0003	0.0014
	(3,5)	0.0014	0.0007	0.0025	0.0007	(30,50)	0.0010	0.0012	0.0007	0.0011
	(5,3)	0.0008	0.0006	0.0010	0.0006	(50,30)	0.0008	0.0010	0.0013	0.0009
	(5,5)	0.0009	0.0004	0.0019	0.0004	(50,50)	0.0005	0.0008	0.0014	0.0008