DOI: xxx/xxxx

Supplementay Materials for "Prediction-Driven Pooled Testing Methods: Application to HIV Treatment Monitoring in Kalisizo, Uganda"

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TABLE S1 Uganda results: ME=0

		Linreg	MSS	LRSOE	MiniCov	Mini
Sensitivity						
	Mean (95% CI)	100% (95.4%, 100%)	100% (95.4%, 100%)	100% (95.4%, 100%)	100% (95.4%, 100%)	100% (95.4%, 100%)
Efficiency						
	Mean (95% CI)	76.8% (75.3%, 78.2%)	76.5% (75.1%, 78%)	76.4% (74.9%, 77.8%)	85.4% (84.1%, 86.6%)	76.2% (74.7%, 77.6%)
	Median (Q1, Q3)	77% (75%, 79%)	77% (76%, 78%)	77% (74%, 78%)	86% (83%, 88%)	76% (70%, 81%)
	Min, Max	72%, 80%	70%, 80%	72%, 80%	78%, 90%	59%, 90%
Rounds						
	Mean (95% CI)	2.7 (2.4, 3)	2.2 (2, 2.4)	2 (1.9, 2.2)	4 (3.2, 4.8)	8.1 (7, 9.1)
	Median (Q1, Q3)	3 (2, 3)	2 (2, 3)	2 (2, 2)	3 (2, 5)	9 (6, 11)
	Min, Max	1, 5	1, 3	1, 3	1, 10	1, 11

TABLE S2 Uganda results: ME=0.05

		Linreg	MSS	LRSOE	MiniCov	Mini
Sensitivity						
	Mean (95% CI)	96.2% (89.3%, 99.2%)	96.2% (89.3%, 99.2%)	97.5% (91.2%, 99.7%)	100% (95.4%, 100%)	100% (95.4%, 100%)
Efficiency						
	Mean (95% CI)	76.5% (75%, 77.9%)	76.5% (75%, 77.9%)	76.1% (74.6%, 77.5%)	81.1% (79.7%, 82.4%)	72.8% (71.2%, 74.3%)
	Median (Q1, Q3)	76% (75%, 79%)	77% (74%, 78%)	76% (74%, 78%)	84% (78%, 87%)	72% (67%, 80%)
	Min, Max	66%, 80%	72%, 80%	70%, 80%	67%, 90%	56%, 90%
Rounds						
	Mean (95% CI)	2.8 (2.4, 3.2)	2.2 (2, 2.4)	2 (1.8, 2.2)	6 (4.6, 7.4)	9.2 (8.3, 10.2)
	Median (Q1, Q3)	3 (2, 3)	2 (2, 3)	2 (2, 2)	5 (2, 11)	10 (9, 11)
	Min, Max	1, 6	1, 3	1, 4	1, 11	1, 11

TABLE S3 Uganda results: ME=0.12

		Linreg	MSS	LRSOE	MiniCov	Mini
Sensitivity						
	Mean (95% CI)	88.6% (79.5%, 94.7%)	89.9% (81%, 95.5%)	91.1% (82.6%, 96.4%)	98.7% (93.1%, 100%)	98.7% (93.1%, 100%)
Efficiency						
	Mean (95% CI)	76.5% (75.1%, 78%)	76.4% (74.9%, 77.8%)	76.1% (74.6%, 77.6%)	79.8% (78.4%, 81.2%)	72% (70.4%, 73.5%)
	Median (Q1, Q3)	77% (76%, 79%)	77% (75%, 78%)	76% (75%, 78%)	84% (74%, 87%)	72% (65%, 79%)
	Min, Max	66%, 80%	70%, 80%	69%, 80%	58%, 90%	56%, 90%
Rounds						
	Mean (95% CI)	2.8 (2.3, 3.2)	2.2 (1.9, 2.4)	2 (1.8, 2.2)	6.2 (4.8, 7.6)	9.4 (8.4, 10.3)
	Median (Q1, Q3)	3 (2, 3)	2 (2, 2)	2 (2, 2)	5 (2, 11)	10 (9, 11)
	Min, Max	1, 6	1, 4	1, 4	1, 11	1, 11

TABLE S4 Uganda results: ME=0.25

		Linreg	MSS	LRSOE	MiniCov	Mini
Sensitivity						
	Mean (95% CI)	83.5% (73.5%, 90.9%)	86.1% (76.5%, 92.8%)	86.1% (76.5%, 92.8%)	97.5% (91.2%, 99.7%)	94.9% (87.5%, 98.6%)
Efficiency						
	Mean (95% CI)	76.1% (74.6%, 77.5%)	75.8% (74.3%, 77.2%)	74.8% (73.2%, 76.2%)	68.7% (67.1%, 70.3%)	62% (60.3%, 63.7%)
	Median (Q1, Q3)	77% (76%, 79%)	77% (74%, 78%)	76% (73%, 78%)	81% (67%, 87%)	70% (56%, 78%)
	Min, Max	53%, 80%	58%, 80%	51%, 80%	-10%, 90%	-10%, 90%
Rounds						
	Mean (95% CI)	2.9 (2.2, 3.6)	2.2 (1.9, 2.6)	2 (1.7, 2.3)	6.7 (5.3, 8.2)	9.7 (8.9, 10.5)
	Median (Q1, Q3)	3 (2, 4)	2 (2, 3)	2 (2, 2)	7 (2, 11)	11 (9, 11)
	Min, Max	1, 11	1, 6	1, 4	1, 11	1, 11

TABLE S5 Uganda results: ME=0.5

		Linreg	MSS	LRSOE	MiniCov	Mini
Sensitivity						
	Mean (95% CI)	77.2% (66.4%, 85.9%)	79.7% (69.2%, 88%)	78.5% (67.8%, 86.9%)	91.1% (82.6%, 96.4%)	91.1% (82.6%, 96.4%)
Efficiency						
	Mean (95% CI)	73% (71.5%, 74.5%)	72% (70.4%, 73.5%)	71% (69.4%, 72.5%)	55% (53.3%, 56.7%)	49% (47.3%, 50.7%)
	Median (Q1, Q3)	77% (74%, 79%)	75% (73%, 79%)	76% (69%, 79%)	81% (-10%, 88%)	69% (-10%, 79%)
	Min, Max	-20%, 80%	-20%, 80%	-20%, 80%	-10%, 90%	-10%, 90%
Rounds						
	Mean (95% CI)	3.6 (2, 5.2)	2.9 (1.6, 4.2)	2.2 (1.7, 2.8)	6.4 (4.9, 8)	9.5 (8.4, 10.5)
	Median (Q1, Q3)	2 (2, 4)	2 (2, 3)	2 (2, 2)	5 (2, 11)	11 (9, 11)
	Min, Max	1, 24	1, 21	1, 9	1, 11	1, 11

TABLE S6 Uganda results: ME=0.75

		Linreg	MSS	LRSOE	MiniCov	Mini
Sensitivity						
	Mean (95% CI)	70.9% (59.6%, 80.6%)	72.2% (60.9%, 81.7%)	70.9% (59.6%, 80.6%)	89.9% (81%, 95.5%)	89.9% (81%, 95.5%)
Efficiency						
	Mean (95% CI)	72.7% (71.1%, 74.2%)	71.7% (70.2%, 73.3%)	69.8% (68.3%, 71.4%)	51% (49.3%, 52.7%)	45.6% (43.9%, 47.3%)
	Median (Q1, Q3)	78% (76%, 80%)	75% (74%, 80%)	76% (69%, 80%)	81% (-10%, 88%)	70% (-10%, 79%)
	Min, Max	-20%, 80%	-20%, 80%	-20%, 80%	-10%, 90%	-10%, 90%
Rounds						
	Mean (95% CI)	3.6 (2, 5.3)	2.9 (1.6, 4.2)	2.3 (1.7, 2.9)	6.5 (4.9, 8)	9.5 (8.4, 10.5)
	Median (Q1, Q3)	2 (1, 4)	2 (1, 3)	2 (1, 2)	5 (2, 11)	11 (9, 11)
	Min, Max	1, 24	1, 21	1, 9	1, 11	1, 11

TABLE S7 Uganda results - Hypred mid tier: ME=0

		Linreg	MSS	LRSOE	MiniPred	Mini.alg
Sensitivity						
	Mean (95% CI)	100% (66.4%, 100%)	100% (66.4%, 100%)	100% (66.4%, 100%)	100% (66.4%, 100%)	100% (66.4%, 100%)
Efficiency						
	Mean (95% CI)	79% (76.3%, 81.5%)	78.6% (75.9%, 81.1%)	78.7% (76%, 81.2%)	86.4% (84.1%, 88.5%)	84.5% (82.1%, 86.7%)
	Median (Q1, Q3)	79% (79%, 79%)	79% (78%, 79%)	79% (78%, 79%)	86.5% (84.2%, 89%)	84% (81.2%, 87.5%)
	Min, Max	77%, 80%	76%, 80%	77%, 80%	81%, 90%	80%, 90%
Rounds						
	Mean (95% CI)	1.9 (1.5, 2.3)	1.8 (1.5, 2.1)	1.8 (1.5, 2.1)	4 (1.9, 6.1)	5.8 (3.3, 8.3)
	Median (Q1, Q3)	2 (2, 2)	2 (2, 2)	2 (2, 2)	3.5 (2, 4.75)	5.5 (3.5, 8.5)
	Min, Max	1, 3	1, 2	1, 2	1, 10	1, 11

TABLE S8 Uganda results - Hypred mid tier: ME=0.05

		Linreg	MSS	LRSOE	MiniPred	Mini.alg
Sensitivity						
	Mean (95% CI)	100% (66.4%, 100%)	100% (66.4%, 100%)	100% (66.4%, 100%)	100% (66.4%, 100%)	100% (66.4%, 100%)
Efficiency						
	Mean (95% CI)	78.9% (76.2%, 81.4%)	78.5% (75.8%, 81%)	78.7% (76%, 81.2%)	84% (81.6%, 86.2%)	84.1% (81.7%, 86.3%)
	Median (Q1, Q3)	79% (79%, 79.8%)	79% (78%, 79.8%)	79% (78%, 79.8%)	85% (80.8%, 88.8%)	83% (80%, 89.2%)
	Min, Max	77%, 80%	76%, 80%	77%, 80%	72%, 90%	78%, 90%
Rounds						
	Mean (95% CI)	1.9 (1.4, 2.4)	1.7 (1.4, 2)	1.7 (1.4, 2)	5.7 (2.7, 8.7)	6.3 (3.1, 9.5)
	Median (Q1, Q3)	2 (1.25, 2)	2 (1.25, 2)	2 (1.25, 2)	5.5 (1.75, 9.75)	7 (1.5, 10.75)
	Min, Max	1, 3	1, 2	1, 2	1, 11	1, 11

TABLE S9 Uganda results - Hypred mid tier: ME=0.12

		Linreg	MSS	LRSOE	MiniPred	Mini.alg
Sensitivity						
	Mean (95% CI)	100% (66.4%, 100%)	100% (66.4%, 100%)	100% (66.4%, 100%)	100% (66.4%, 100%)	100% (66.4%, 100%)
Efficiency						
	Mean (95% CI)	78.4% (75.7%, 80.9%)	78.1% (75.4%, 80.6%)	78.5% (75.8%, 81%)	82.9% (80.4%, 85.2%)	82.9% (80.4%, 85.2%)
	Median (Q1, Q3)	79% (77.2%, 79.8%)	79% (76%, 79.8%)	79% (77.2%, 79.8%)	83% (80%, 88.8%)	83% (80%, 88.8%)
	Min, Max	76%, 80%	76%, 80%	76%, 80%	72%, 90%	71%, 90%
Rounds						
	Mean (95% CI)	2.2 (1.4, 3)	1.7 (1.4, 2)	1.8 (1.3, 2.3)	6.3 (3.1, 9.5)	6.6 (3.5, 9.7)
	Median (Q1, Q3)	2 (1.25, 2.75)	2 (1.25, 2)	2 (1.25, 2)	6 (1.75, 11)	7 (2, 11)
	Min, Max	1, 4	1, 2	1, 3	1, 11	1, 11

TABLE S10 Uganda results - Hypred mid tier: ME=0.25

		Linreg	MSS	LRSOE	MiniPred	Mini.alg
Sensitivity						
	Mean (95% CI)	100% (66.4%, 100%)	100% (66.4%, 100%)	100% (66.4%, 100%)	100% (66.4%, 100%)	100% (66.4%, 100%)
Efficiency						
	Mean (95% CI)	78.4% (75.7%, 80.9%)	78.1% (75.4%, 80.6%)	78.4% (75.7%, 80.9%)	81.1% (78.5%, 83.5%)	81% (78.4%, 83.4%)
	Median (Q1, Q3)	79% (77.2%, 79.8%)	79% (76%, 79.8%)	79% (77%, 79.8%)	80% (77.5%, 88.8%)	80% (77.5%, 88.5%)
	Min, Max	76%, 80%	76%, 80%	76%, 80%	70%, 90%	70%, 90%
Rounds						
	Mean (95% CI)	2.2 (1.4, 3)	1.7 (1.4, 2)	1.8 (1.3, 2.3)	7.1 (3.8, 10.4)	7.3 (4, 10.6)
	Median (Q1, Q3)	2 (1.25, 2.75)	2 (1.25, 2)	2 (1.25, 2)	9 (2.25, 11)	9.5 (2.5, 11)
	Min, Max	1, 4	1, 2	1, 3	1, 11	1, 11

TABLE S11 Uganda results - Hypred mid tier: ME=0.5

		Linreg	MSS	LRSOE	MiniPred	Mini.alg
Sensitivity						
	Mean (95% CI)	100% (66.4%, 100%)	100% (66.4%, 100%)	100% (66.4%, 100%)	100% (66.4%, 100%)	100% (66.4%, 100%)
Efficiency						
	Mean (95% CI)	72.1% (69.2%, 74.9%)	71.8% (68.9%, 74.6%)	70.3% (67.4%, 73.1%)	62.8% (59.7%, 65.8%)	62.6% (59.5%, 65.6%)
	Median (Q1, Q3)	79% (76%, 79.8%)	77.5% (74.2%, 79.8%)	77.5% (68.5%, 79.8%)	77% (46%, 87.5%)	76% (46%, 87.5%)
	Min, Max	26%, 80%	30%, 80%	28%, 80%	-10%, 90%	-10%, 90%
Rounds						
	Mean (95% CI)	4 (1.1, 6.9)	2.9 (0.8, 5)	2.4 (1.3, 3.5)	8 (4.5, 11.5)	8 (4.5, 11.5)
	Median (Q1, Q3)	2 (1.25, 4)	2 (1.25, 2.75)	2 (1.25, 3)	11 (3.5, 11)	11 (3.5, 11)
	Min, Max	1, 12	1, 11	1, 6	1, 11	1, 11

TABLE S12 Uganda results - Hypred mid tier: ME=0.75

		Linreg	MSS	LRSOE	MiniPred	Mini.alg
Sensitivity						
	Mean (95% CI)	100% (66.4%, 100%)	100% (66.4%, 100%)	100% (66.4%, 100%)	100% (66.4%, 100%)	100% (66.4%, 100%)
Efficiency						
	Mean (95% CI)	56.3% (53.2%, 59.4%)	56% (52.9%, 59.1%)	54.6% (51.5%, 57.7%)	47% (43.9%, 50.1%)	47% (43.9%, 50.1%)
	Median (Q1, Q3)	74.5% (48%, 79.8%)	72.5% (48%, 79.8%)	70% (42.8%, 79.8%)	62% (-1%, 87.5%)	62% (-1%, 87.5%)
	Min, Max	-20%, 80%	-20%, 80%	-20%, 80%	-10%, 90%	-10%, 90%
Rounds						
	Mean (95% CI)	8.6 (2.7, 14.5)	6 (1, 11)	3.3 (1.2, 5.4)	8 (4.5, 11.5)	8 (4.5, 11.5)
	Median (Q1, Q3)	6.5 (1.25, 14)	2.5 (1.25, 8)	2 (1.25, 4.5)	11 (3.5, 11)	11 (3.5, 11)
	Min, Max	1, 24	1, 21	1, 10	1, 11	1, 11

TABLE S13 Uganda results - Hypred low tier: ME=0

		Linreg	MSS	LRSOE	MiniPred	Mini.alg
Sensitivity						
	Mean (95% CI)	100% (54.1%, 100%)	100% (54.1%, 100%)	100% (54.1%, 100%)	100% (54.1%, 100%)	100% (54.1%, 100%)
Efficiency						
	Mean (95% CI)	79.7% (77.9%, 81.4%)	79.7% (77.8%, 81.4%)	79.7% (77.8%, 81.4%)	89.1% (87.7%, 90.4%)	88.9% (87.5%, 90.3%)
	Median (Q1, Q3)	80% (79.8%, 80%)	80% (79.8%, 80%)	80% (79.8%, 80%)	90% (89.8%, 90%)	90% (89.8%, 90%)
	Min, Max	78%, 80%	78%, 80%	78%, 80%	82%, 90%	80%, 90%
Rounds						
	Mean (95% CI)	1.3 (1, 1.6)	1.2 (1, 1.5)	1.2 (1, 1.5)	1.8 (0.9, 2.8)	1.8 (1, 2.6)
	Median (Q1, Q3)	1 (1, 1.25)	1 (1, 1.25)	1 (1, 1.25)	1 (1, 1.25)	1 (1, 1.25)
	Min, Max	1, 3	1, 2	1, 2	1, 8	1, 6

TABLE S14 Uganda results - Hypred low tier: ME=0.05

		Linreg	MSS	LRSOE	MiniPred	Mini.alg
Sensitivity						
	Mean (95% CI)	100% (54.1%, 100%)	100% (54.1%, 100%)	100% (54.1%, 100%)	100% (54.1%, 100%)	100% (54.1%, 100%)
Efficiency						
	Mean (95% CI)	79.7% (77.9%, 81.4%)	79.7% (77.9%, 81.4%)	79.7% (77.9%, 81.4%)	88.7% (87.2%, 90.1%)	87.5% (86%, 88.9%)
	Median (Q1, Q3)	80% (79.8%, 80%)	80% (79.8%, 80%)	80% (79.8%, 80%)	90% (88.8%, 90%)	90% (87.2%, 90%)
	Min, Max	78%, 80%	78%, 80%	78%, 80%	80%, 90%	72%, 90%
Rounds						
	Mean (95% CI)	1.3 (1, 1.6)	1.2 (1, 1.5)	1.2 (1, 1.5)	2.2 (1, 3.4)	3 (1.4, 4.7)
	Median (Q1, Q3)	1 (1, 1.25)	1 (1, 1.25)	1 (1, 1.25)	1 (1, 2.25)	1 (1, 3.75)
	Min, Max	1, 3	1, 2	1, 2	1, 11	1, 11

TABLE S15 Uganda results - Hypred low tier: ME=0.12

		Linreg	MSS	LRSOE	MiniPred	Mini.alg
Sensitivity						
	Mean (95% CI)	66.7% (22.3%, 95.7%)	83.3% (35.9%, 99.6%)	83.3% (35.9%, 99.6%)	100% (54.1%, 100%)	83.3% (35.9%, 99.6%)
Efficiency						
	Mean (95% CI)	79.8% (78%, 81.5%)	79.8% (77.9%, 81.5%)	79.8% (77.9%, 81.5%)	87.1% (85.5%, 88.5%)	86.4% (84.8%, 87.9%)
	Median (Q1, Q3)	80% (80%, 80%)	80% (80%, 80%)	80% (80%, 80%)	90% (85.2%, 90%)	90% (82.7%, 90%)
	Min, Max	79%, 80%	78%, 80%	78%, 80%	70%, 90%	70%, 90%
Rounds						
	Mean (95% CI)	1.2 (1, 1.4)	1.2 (1, 1.4)	1.2 (1, 1.4)	2.5 (1.1, 3.9)	3.1 (1.5, 4.7)
	Median (Q1, Q3)	1 (1, 1)	1 (1, 1)	1 (1, 1)	1 (1, 2.25)	1 (1, 3.75)
	Min, Max	1, 2	1, 2	1, 2	1, 11	1, 11

TABLE S16 Uganda results - Hypred low tier: ME=0.25

		Linreg	MSS	LRSOE	MiniPred	Mini.alg
Sensitivity						
	Mean (95% CI)	50% (11.8%, 88.2%)	50% (11.8%, 88.2%)	50% (11.8%, 88.2%)	50% (11.8%, 88.2%)	50% (11.8%, 88.2%)
Efficiency						
	Mean (95% CI)	79.8% (78%, 81.6%)	79.8% (78%, 81.6%)	79.8% (78%, 81.6%)	78.3% (76.5%, 80.1%)	78.3% (76.5%, 80.1%)
	Median (Q1, Q3)	80% (80%, 80%)	80% (80%, 80%)	80% (80%, 80%)	90% (83.8%, 90%)	90% (83.8%, 90%)
	Min, Max	79%, 80%	79%, 80%	79%, 80%	-10%, 90%	-10%, 90%
Rounds						
	Mean (95% CI)	1.1 (1, 1.3)	1.1 (1, 1.3)	1.1 (1, 1.3)	3.6 (1.7, 5.6)	3.6 (1.7, 5.6)
	Median (Q1, Q3)	1 (1, 1)	1 (1, 1)	1 (1, 1)	1 (1, 7.25)	1 (1, 7.25)
	Min, Max	1, 2	1, 2	1, 2	1, 11	1, 11

TABLE S17 Uganda results - Hypred low tier: ME=0.5

		Linreg	MSS	LRSOE	MiniPred	Mini.alg
Sensitivity						
	Mean (95% CI)	33.3% (4.3%, 77.7%)	33.3% (4.3%, 77.7%)	33.3% (4.3%, 77.7%)	50% (11.8%, 88.2%)	50% (11.8%, 88.2%)
Efficiency						
	Mean (95% CI)	78.2% (76.4%, 80%)	78.4% (76.5%, 80.2%)	78% (76.2%, 79.8%)	73.9% (71.9%, 75.8%)	73.9% (71.9%, 75.8%)
	Median (Q1, Q3)	80% (80%, 80%)	80% (80%, 80%)	80% (80%, 80%)	90% (85.2%, 90%)	90% (85.2%, 90%)
	Min, Max	47%, 80%	50%, 80%	43%, 80%	-10%, 90%	-10%, 90%
Rounds						
	Mean (95% CI)	1.4 (0.7, 2.2)	1.4 (0.8, 2)	1.3 (0.9, 1.7)	3.6 (1.6, 5.7)	3.6 (1.6, 5.7)
	Median (Q1, Q3)	1 (1, 1)	1 (1, 1)	1 (1, 1)	1 (1, 5.75)	1 (1, 5.75)
	Min, Max	1, 8	1, 7	1, 5	1, 11	1, 11

TABLE S18 Uganda results - Hypred low tier: ME=0.75

		Linreg	MSS	LRSOE	MiniPred	Mini.alg
Sensitivity						
	Mean (95% CI)	33.3% (4.3%, 77.7%)	33.3% (4.3%, 77.7%)	33.3% (4.3%, 77.7%)	50% (11.8%, 88.2%)	50% (11.8%, 88.2%)
Efficiency						
	Mean (95% CI)	71.5% (69.5%, 73.5%)	71.7% (69.6%, 73.6%)	71.5% (69.4%, 73.4%)	64% (61.9%, 66.1%)	64% (61.9%, 66.1%)
	Median (Q1, Q3)	80% (79.8%, 80%)	80% (79.8%, 80%)	80% (79.8%, 80%)	90% (50%, 90%)	90% (50%, 90%)
	Min, Max	-20%, 80%	-20%, 80%	-20%, 80%	-10%, 90%	-10%, 90%
Rounds						
	Mean (95% CI)	3 (0.5, 5.5)	2.8 (0.5, 5)	1.9 (0.9, 2.9)	4.5 (2.4, 6.6)	4.5 (2.4, 6.6)
	Median (Q1, Q3)	1 (1, 1.25)	1 (1, 1.25)	1 (1, 1.25)	1 (1, 8.75)	1 (1, 8.75)
	Min, Max	1, 24	1, 21	1, 10	1, 11	1, 11

References