Published in final edited form as:

Stat Med. 2013 September 10; 32(20): 3592–3593. doi:10.1002/sim.5805.

Reply to Taguri and Matsuyama

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We thank Drs Taguri and Matsuyama for their letter [1] and suggested modification to our proposed information criterion for inverse probability weighted estimation in marginal structural models. Here, we provide some clarifications and corrections and point out some areas of agreement and disagreement.

We thank Taguri and Matsuyama for pointing out the typographical error in the formula on page 4; in fact, that formula contained other typographical errors; the correct version is

$$QIC_w(\hat{m}) = 2p - \frac{1}{n} \sum_{i=1}^n \frac{(Y_i - \hat{m}(X_i(1), X_i(2), V_i))^2}{P(X_i(2) = x_i(2) | \bar{L}_i(2), x_i(1)) P(X_i(1) = x_i(1) | L_i(1))}$$

where Y_i is the observed outcome, $X(1)$ and $X(2)$ the two exposures, L the confounder, and $\hat{m}(X_i(1), X_i(2), V_i)$ the fitted value from model m .

Given this correct version of the formula, it is evident that our QIC does not depend on independence of the counterfactual random variables.

When comparing Taguri and Matsuyama's proposed QIC, labeled QIC_{TM} , with ours in a simulation study generated similarly to that previously reported [2], we also found that we had transposed some of our published simulation results so that the percentage selected by

QIC was incorrect. Table I demonstrates that the results based on the two proposed criteria are almost identical.

We disagree with Taguri and Matsuyama regarding the use of their proposed QIC in the context of our paper. They are correct, following Pan [3], in stating that the QIC should take into account dependence between correlated observations when there are repeated measurements on subjects. However, as demonstrated in Table I and following Hens *et al.* [4], it is not necessary in the present context. It is worth noting, therefore, that in some settings (e.g., repeated measures [5], in which each subject contributes multiple correlated and weighted observations), the corrected QIC_w proposed by Taguri and Matsuyama may be more appropriate. Simulation studies to demonstrate the properties of the different measures in that setting are warranted.

References

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Table I.

Results of revised simulations.

True model (b_1, b_2, b_3, b_4)	Sample size	Percentage of simulation runs each model selected					
		Saturated		Reduced		Simple	
		QIC_w	QIC_{TM}	QIC_w	QIC_{TM}	QIC_w	QIC_{TM}
(0, 0, 0, 0)	200	56.6	55.2	22.3	22.6	21.1	22.2
	1000	50.3	50	25.1	25.2	24.6	24.8
	5000	49.1	48.9	24.1	24.2	26.8	26.9
	10,000	47.4	47.3	24	24	28.6	28.7
(1, 1, 1, 1)	200	38.8	37.9	34.2	34.4	27	27.7
	1000	13.7	13.7	44.8	44.7	41.5	41.6
	5000	0.1	0.1	51.2	51.1	48.7	48.8
	10,000	0	0	49.9	49.8	50.1	50.2
(2, 2, 2, 2)	200	73.7	72.7	19.5	20.3	6.8	7
	1000	78.2	78.2	20.4	20.4	1.4	1.4
	5000	89.6	89.6	10.4	10.4	0	0
	10,000	95.3	95.3	4.7	4.7	0	0
(3, 3, 3, 3)	200	93.3	92.9	5.3	5.6	1.4	1.5
	1000	98.3	98.2	1.6	1.7	0.1	0.1
	5000	99.7	99.7	0.3	0.3	0	0
	10,000	100	100	0	0	0	0
(1, 1, 0, 0)	200	59.7	59	22.6	22.7	17.7	18.3
	1000	51.2	50.6	22.9	23.2	25.9	26.2
	5000	50.6	50.6	23.5	23.5	25.9	25.9
	10,000	49	48.7	26.8	27	24.2	24.3
(2, 2, 0, 0)	200	63.2	61.7	32.2	33.4	4.6	4.9
	1000	56.1	55.4	42.7	43.4	1.2	1.2
	5000	56.2	56	43.8	44	0	0
	10,000	54.1	54.1	45.9	45.9	0	0
(3, 3, 0, 0)	200	67.4	66.1	31.9	33.2	0.7	0.7
	1000	62.2	61.8	37.8	38.2	0	0
	5000	61.1	61	38.9	39	0	0
	10,000	55.7	55.3	44.3	44.7	0	0