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ERRATUM

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Erratum: Two-stage complete allocation sampling

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This article corrects: Salehi MM, Seber GAF. Two-stage complete allocation sampling. Environmetrics. 2017;28:e2441. https://doi.org/10.1002/env.2441. The main correction is on the introduced unbiased estimator of the variance of each primary unit total estimator. The other errors were just typos.

Salehi and Seber (2017) was published with some errors as follows.

1. Division operators are missing in the denominator of Equation 4 and the numerator and denominator of Equation 5 during the proof process. They should respectively be

$$\frac{P(s_i|j)}{P(s_i)} = \frac{1}{1-\binom{N_i-k_i}{n_i}\Big/\binom{N_i}{n_i}} = \frac{1}{F_i(0)}$$

$$\frac{P(s_i|j)}{P(s_i)} = \frac{1-\binom{N_i-k_i-1}{n_i-1}\Big/\binom{N_i-1}{n_i-1}}{1-\binom{N_i-k_i}{n_i}\Big/\binom{N_i}{n_i}} = \frac{F_i(1)}{F_i(0)}.$$

2. Equation 8 was developed for another sampling design, which is not correct for the introduced sampling design. The corrected version is

$$\widehat{\mathrm{Var}}(\hat{\tau}_i) = \begin{cases} \frac{k_i}{F_i(0)}\left[k_i\left(1-\frac{1}{F_i(0)}\right)+(N_i-k_i)\left(1-\frac{F_i(1)}{F_i(0)}\right)\right]\sigma^2_{ic} & |s_i| = N_i \\ +\frac{(N_i-k_i)k_i}{F_i(0)}\left(1-\frac{F_i(1)}{F_i(0)}\right)(\mu_{ic}-\mu_{ic'})^2+ & \\ \frac{(N_i-k_i)}{F_i(0)}\left[(N_i-k_i)\left(F_i(2)-\frac{F_i^2(1)}{F_i(0)}\right)+k_i\left(1-\frac{F_i(1)}{F_i(0)}\right)\right]\sigma^2_{ic'} & \\ N_i^2\left(1-\frac{n_i}{N_i}\right)\frac{s_i^2}{n_i} & |s_i| = n_i. \end{cases}$$

As a result $\widehat{\mathrm{Var}}(\hat{\tau}_3)$ and $\widehat{\mathrm{Var}}(\hat{\tau})$ in section 3 on page 5 will respectively be corrected to

$$\begin{aligned}\widehat{\mathrm{Var}}(\hat{\tau}_3) &= \frac{12}{0.88}\left(12\left(1-\frac{1}{0.88}\right)+13\left(1-\frac{0.76}{0.88}\right)\right)23.39 \\ &\quad+\frac{(12)(13)}{0.88}\left(1-\frac{0.76}{0.88}\right)(5.33-0.15)^2+\frac{13}{0.88}\left(13\left(0.52-\frac{0.76}{0.88}\right)-12\left(1-\frac{0.76}{0.88}\right)\right)0.13 \\ &= 692.13. \\ \widehat{\mathrm{Var}}(\hat{\tau}) &= (12)(6)\frac{743.89}{6}+\frac{12}{6}(0+0+692.13+0+17.36+0) \\ &= 8926.71+1418.98 = 10345.69.\end{aligned}$$

The last statement in section 3 should be corrected to "the second term of $\widehat{\mathrm{Var}}(\hat{\tau})$ composes only about 13.7% of its total."

3. On page 4, the first statement on the left-hand side of $\widetilde{\mathrm{V}}\mathrm{ar}(\hat{\tau})$ should be multiplied by 1/2. It should be corrected to

$$\widetilde{\mathrm{V}}\mathrm{ar}(\hat{\tau}) = \frac{1}{2}\sum_{i=1}^{m}\sum_{i'=1}^{m}\left(\frac{\pi_i\pi_{i'} - \pi_{ii'}}{\pi_{ii'}}\right)\left(\frac{\hat{\tau}_i}{\pi_i} - \frac{\hat{\tau}_{i'}}{\pi_{i'}}\right)^2 + \sum_{i=1}^{m}\frac{\widehat{\mathrm{V}}\mathrm{ar}(\hat{\tau}_i)}{\pi_i}.$$

4. In Figure 1, at the row, column position (4,4) in primary unit 3, the value should be corrected to 8 rather 2. This was just a typo, and the value of 8 was used in all computations.

These changes do not affect any other parts, simulation results, and conclusions of the previously published article.

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The errors were noticed by Prof. David G. Hankin of Humboldt State University, who is including the introduced sampling method to his upcoming book. My sincere thanks goes to him for bringing these errors to my attention.

REFERENCE

Salehi, M. M., & Seber, G. A. F. (2017). Two-stage complete allocation sampling. *Environmetrics*, *28*, e2441. https://doi.org/10.1002/env.2441

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