A STRATIFIED RR MODEL USING THE POLYA'S URN PROCESS

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ABSTRACT

Taking the clue from the pioneering work of [1] we have advocated an innovative stratified RR ideal. The belongings of the succumbed stratified RR ideal have been studied under proportional and "Neyman" allocations. Numerical illustrations are also given in provision of the current reading.

KEYWORDS

Randomized response procedure, Proportional allocation, Neyman allocation, Mean square error.

1 Introduction

Direct surveys was needed that made people relaxed and heartened truthful answers. [18] settled such a marginal survey technique that is called randomized response (RR) technique. [18] premeditated a randomization device. Subsequently, numerous other employees have planned different RR strategies for illustration, see the review oriented references like [2-7], [9-13] and papers by [15-17].

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1.1 Kuk's randomized response model

[8] advocated

$$\theta_k = \theta_1 \pi_S + (1-\pi_S)\theta_2 \ ,$$

For the [8] , $\hat{\pi}_k = \dfrac{\hat{\theta}-\theta_2}{\theta_1-\theta_2}, \quad \theta_1 \neq \theta_2$.

variance

$$V(\hat{\pi}_k) = \frac{\theta_k(1-\theta_k)}{n(\theta_1-\theta_2)^2} \quad .$$

[15] recommended Geometric distribution in [8] model.

1.2 Singh and Grewal's randomized response model

In this randomization model

$$Z_i = \alpha_i X_i + (1-\alpha_i)Y_i,$$

and

$$E(Z_i) = \frac{\pi}{\theta_1^*} + \frac{(1-\pi)}{\theta_2^*}.$$

with unbiased estimate

$$\hat{\pi}_{SG} \ \frac{\pi\theta_1^*\theta_2^* - \theta_1^*}{(\theta_2^* - \theta_1^*)}, \theta_1^* \neq \theta_2^*,$$

and variance

$$V(\hat{\pi}_{SG}) = \frac{\pi(1-\pi)}{n} + \frac{\left\{\theta_2^{*2}(1-\theta_1^*)\pi + \theta_1^{*2}(1-\theta_2^*)(1-\pi)\right\}}{n(\theta_2^* - \theta_1^*)^2}$$

[1] suggested an interesting improvement in [8] and [15].

2 Suggested stratified randomized response strategies - TSRRT1

We extend [1] education to stratified sampling.