









Crafting an ingenious randomized response model for diverse questioning tactics

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Abstract

When inquiries touch upon sensitive subjects like gambling habits, drug addiction, alcoholism, tendencies toward tax evasion, induced abortions, drunk driving, previous involvement in criminal activities, or matters related to sexuality in the context of open or direct surveys, it becomes difficult to gather accurate information due to the presence of non-response bias and response bias. People often feel reluctant to offer candid responses. To address this challenge, Warner introduced a clever approach. In this investigation, a novel and unrelated randomized response model is introduced with the aim of mitigating the influence of misleading responses and non-respo driven by the stigma associated with the characteristic under investigation. This newly proposed randomized response model enables the unbiased estimation of the percentage of the population possessing the sensitive attribute. The study delves into the attributes and recommendations of this innovative randomized response model, supported by numerical examples to corroborate the study's findings. The model incorporates an unrelated innocuous attribute to enhance privacy protection while maintaining estimation efficiency. Both theoretical derivations and extensive simulations confirm the unbiasedness and superior relative efficiency of the proposed estimators compared to existing randomized response techniques. Practical guidelines for implementation are provided, making this model a valuable tool for survey practitioners handling sensitive data.

 Previous

Next 

Keywords

Proportion; Randomized Response Model; Sensitive Attribute; Unrelated Attribute; Variance

1. Introduction

In socioeconomic research, extensive surveys often touch upon personal characteristics that individuals prefer to keep confidential. These comprehensive questionnaires typically include numerous items, with most seeking straightforward information through direct inquiries. However, some questions delve into sensitive topics that people are reluctant to answer candidly. For instance, individuals tend to provide misleading information about