



THE UNIVERSITY OF  
CHICAGO

Department of Statistics

MASTER'S THESIS PRESENTATION

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YUHEI KOSHINO

Department of Statistics  
The University of Chicago

Evaluation of Methods for Adjusting Partial Non-responses and  
Sensitivity Analysis of Estimated Vaccination Coverage Rate:  
National Immunization Survey 2018

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Jones 111, 5747 S. Ellis Avenue

ABSTRACT

This paper investigates the possibility of nonresponse bias in the 2018 National Immunization Survey – Child (NIS-Child) and proposes a new hot-deck imputation method for treating missing vaccination histories. NIS-Child is a large random digit dialing telephone survey sponsored by the Centers for Disease Control and Prevention and conducted to measure the vaccination status of American children aged 19 to 35 months. NIS-Child sampling, data collection, weighting operations have been conducted by NORC at the University of Chicago. For evaluation, “quasi-population” is created using data from the 2018 NIS-Child Public-Use Data File and vaccination coverage rates for up-to-date flag for provider 4:3:1:3:3:1:4 (4+ DT-containing, 3+ Polio-containing, 1+ Measles-containing, 3+ HIB-containing, 3+ Hepatitis B-containing, 1+ Varicella-containing, and 4+ Pneumococcal-containing) are compared by the imputation method and by the standard weighting class adjustment method through simulation. Furthermore, a sensitive analysis – sensitivity of the vaccination coverage rates to the number of covariates and cells used in the weighting adjustment method – is conducted.