# **ASA-BI Statistics Webinar Series**



**Rui Wang, PhD** Associate Professor, Department of Population Medicine Harvard University, USA

### August 16th, Thursday, 9-10 am EST

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#### Boehringer Ingelheim

#### Title

Design and Analysis of Parallel and Stepped-Wedge Cluster Randomized Trials

#### **Abstract**

Cluster randomized trials (CRTs) are well-suited to evaluate intervention strategies against infectious diseases from the prevention of HIV and hospital-acquired infections to the control of Ebola outbreak. CRTs capture both direct and indirect effects of intervention, the latter one depends heavily on the contact networks within and across clusters. In this talk, I will present some recent developments on the design and analysis of cluster randomized trials. In the design of the Botswana Prevention Combination Project, we developed an agent-based model to simulate the impact of combination intervention strategy for HIV prevention by first constructing collections of contact networks and then propagate disease epidemic on them using agent-based SIRtype state-transition models. Motived by an acute epidemic setting where there is a need to evaluate the intervention effect and to accomplish rapid control of the epidemic simultaneously, we proposed a class of study designs that leverage contact network information to determine an order for intervention delivery. We investigated the use of randomization-based inference in parallel and stepped-wedge CRTs and demonstrated its validity and, in some settings, superiority over parametric model-based inference. Finally, we developed semiparametric doubly robust estimators for the intervention effect to account for informative missing outcome data.

## **Professional Biography**

Dr. Rui Wang is an Associate Professor of Population Medicine and Director of the Biostatistics Center in the Department of Population Medicine at Harvard Medical School and Harvard Pilgrim Health Care Institute. She is also an Associate Professor in the Department of Biostatistics at Harvard T.H. Chan School of Public Health. Her research interests include the design and analysis of cluster randomized trials. correlation structure and the issue of missing data.

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