

Multiphase Optimization Strategy (MOST) for Equitable Cluster Randomized Interventions: Design Considerations and Statistical Modeling

Wednesday 23 July 2025 15:00 (15 minutes)

Oral presentation

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Abstract

The Multiphase Optimization Strategy (MOST) is a principled framework that integrates behavioral science, engineering, implementation science, economics, and decision science to optimize interventions. MOST enables researchers to strategically balance effectiveness, affordability, scalability, and efficiency. In this presentation, we provide an overview of MOST, highlighting key experimental designs for intervention optimization and guiding principles for selecting intervention components based on empirical evidence.

A particular focus is placed on factorial experimental designs for optimizing cluster-randomized interventions, where participants are nested within higher-level units (e.g., students within schools, employees within organizations). We discuss key methodological considerations, including the use of mixed-effects modeling to analyze clustered data.

Additionally, we introduce an approach to optimizing interventions for health equity within MOST. We define intervention equitability as the extent to which health benefits are distributed evenly across populations, rather than disproportionately benefiting already advantaged groups. If equitability is a priority, it should be explicitly incorporated as a criterion alongside effectiveness, affordability, scalability, and efficiency. Using a hypothetical case study, we illustrate how MOST can be applied in cluster-randomized trials to achieve an optimal balance that integrates equitability as a core objective.

This work underscores the importance of a systematic, evidence-based approach to optimizing interventions that not only maximize impact but also promote fairness in health outcomes.

Keywords

MOST, factorial designs, equitability, clusters

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Session Classification: Session 7 : "Clustering and classification methods in psychology"

Track Classification: Design/Research methods: Design/Research methods