
A method for systematic community selection in evaluating public health interventions: The example of screening mammography.

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Résumé

BACKGROUND: Community based participatory research often relies on convenience selection based on co-location with an academic center. It has been known for more than 50 years that even a single, biological, public health intervention may produce significantly different outcomes in communities with virtually identical socio-demographic features. It is therefore puzzling that systematic accounting for context-level interactions in the design of randomized trials of community or organizational-level interventions is almost unknown. Since such interactions may promote unintended disparities when public health interventions are successful, there is an urgent need for better methods to address community effect modification and avoid bias. In this presentation, we propose a new method of community selection in mammogram intervention using prior information.

METHODS: We propose a systematic approach to community-based samples in order to improve validity. We define a health disparity function $D: \mathbf{I} \rightarrow \mathbf{R}^2$, where \mathbf{I} is a set of communities identifiers and \mathbf{R}^2 is the set of vectors of dimension 2. We use a mathematical relation to create a classification scheme among communities based on the disparity function and based on prior experience of mammogram utilization. Probability distributions are computed for each set of communities. Probability based stratified random sampling is then conducted in each set. Oversampling may also be used where appropriate.

RESULTS: Probability based stratified random sampling yields community sets that are far more likely to comprise a valid community sample than would be the case if community selection were based on convenience or feasibility or if analyses accounted for known socio-demographic and/or behavioral correlates of disease outcomes. The new methodology is theoretically advantageous as it makes no assumptions about community capability and achieves a greater likelihood of selecting communities that comprise the full spectrum of community contextual issues.

CONCLUSIONS: The resulting community selection is consistent with the reflection of disparities as they present in the general population of communities. This may enable community-academic partnerships to achieve more valid estimates of community-based, participatory interventions.

Mots-Clés: community, based samples, mammogram, communities identifiers

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