

## EDITOR'S CHOICE



# Evaluation and Public Health

It may be a misnomer to call this issue of the Journal an evaluation issue, since the works contained in every issue of the Journal are in some way evaluations. This is neither the first nor, clearly, the last issue that will provide as a focus elements of evaluation. The word “evaluation” takes on a variety of meanings and goes by several aliases across disciplines. But whatever the definition of evaluation, “public health” is itself in the business of improving the public’s health. How better to do so than by seeking to understand what programs, policies, and therapies are effective? Even the exploration of the antecedents or correlates of a phenomenon are undertaken so that we can know better where and how to intervene.

Evaluation is an essential part of public health; without evaluation’s close ties to program implementation, we are left with the unsatisfactory circumstance of either wasting resources on ineffective programs or, perhaps worse, continuing public health practices that do more harm than good. The public health literature is replete with examples of well-intentioned but unevaluated programs (e.g., the injection of gold salts to treat tuberculosis, early incarnations of the DARE substance abuse prevention program, hormone replacement therapy) that were continued, sometimes for decades, until rigorous and appropriate evaluations revealed that the results were not as intended.

If, as Mervyn Susser wrote in 1996 in this Journal, “design is a means of eliciting, as best we can, the valid relationships between cause and effect” (*Am J Public Health*. 1996; 86:1713), then careful attention to the type of experimental design and associated statistical analyses is clearly warranted. One experimental design becoming increasingly common in public health is the cluster or group-randomized trial, characterized as the randomization of groups to treatments that are larger than the unit of analysis. For ex-

ample, in this type of design physician practices might be assigned to implement an enhanced waiting room intervention versus a standard waiting room intervention, although patient responses are the intended unit of analysis. Although this type of design has clear administrative and experimental design advantages, one consequence is that these analytic units are no longer independent, violating the assumption that most common statistical tests demand. Once Jerome Cornfield pointed out in 1978 that “[r]andomization by cluster, accompanied by an analysis appropriate to randomization by individual is an exercise in self-deception, however, and should be discouraged” (*Am J Epidemiol*. 1978;108:101–102), the public health researcher was typically left with 2 undesirable alternatives: proceed with the analysis, ignoring the lack of independence, or use the unit of assignment as the unit of analysis. The former approach allowed for inflated type I error rates; the latter left no room to adjust for individual-level covariates and resulted in limited power.

Although numerous statistical models (in the form of general and generalized linear mixed models) have been developed, it was the continued stellar work of Allan Donner and colleagues and David Murray and colleagues that kept the issue at the forefront of public health and that offered accessible solutions to this public health design and analysis staple. This issue of the Journal continues this important conversation with the valued input of Donner and Murray. The benefits of the group-randomized trial, and the trial’s widespread use in public health, mean that we need to do a better job of understanding the design and analytic implications of this experimental design. Take a look. ■

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