

May 2000 Supplement on Preventing Occupational Injuries

To the Editor:

The May 2000 supplement to the *American Journal of Preventive Medicine*, "Systematic Reviews of Strategies to Prevent Occupational Injuries,"¹ is an important contribution to prevention research in occupational safety and health. It raises some important issues concerning how we evaluate the effectiveness of public health strategies, particularly with respect to occupational safety and health interventions.

The authors and commentators make two major points that deserve further consideration: (1) research is often of poor quality, lacking control groups, randomization, and other means to control for confounding factors (the prevailing standard for high quality among the authors seems to be a randomized, controlled trial [RCT]); and (2) "new interventions should only be implemented in conjunction with evaluative research to document their effectiveness."²

There are practical factors that substantially limit the opportunities for using RCTs in occupational safety and health. Thus, if our intervention research perspective is limited to the experimental method alone, in which the RCT is the reference standard, we will likely lose opportunities to evaluate potentially useful interventions across many work settings. The increasing rate of technologic diffusion and organizational change in work operations limits the scope in which interventions can be implemented under relatively stable conditions. Within individual workplaces, it is rarely possible to divide the workforce into intervention and control groups, and it is often even more difficult to employ random selection and random assignment. Management and worker commitment to sustaining stable conditions, particularly for a control group, is difficult to achieve. Indeed, during times of rapid organizational change that is characterized by high employee turnover, downsizing, upsizing, and reorganizations, the feasibility of maintaining stable interventions and research groups is reduced. Also, adherence to an RCT quality standard would cause far too many potential safety and health solutions to remain entirely unexamined, given the limited federal budget for occupational safety and health research, the scarcity of professionals who are able to do the work, and the range of issues and industries that need to be addressed.

In addition to RCTs, there are other research strategies that should be pursued with equal determination. With respect to individual worksite studies, we should

encourage increased use of a wide variety of quasi-experimental research designs³ and greater use of qualitative research methods.⁴⁻⁶ At the industry level, we should fund a variety of research approaches to answer the same research question across different regions, economic conditions, and so forth. This approach would allow us to rely less on the expectation that ultimate methodologic rigor be achieved in any individual study and more on the triangulation of findings from differing, but related intervention studies—what one evaluation research leader recommends as "contagious cross-validation."⁷ Such an approach increases our confidence in both the reliability and generalizability of the results of the evaluations.

These other research strategies also imply the need for more broad-based review strategies for judging intervention effectiveness and for issuing evidence-based public health guidance. The analogy of seeing only what occurs under the streetlight might be appropriate here. The more narrowly we restrict the methods of our evaluations, the less we will be able to capture the diverse world of occupational safety and health interventions. The criteria for including a study in the review need to be more inclusive than those dictated by experimental design, to broaden the variety allowed among studies compared. Accompanying this greater inclusiveness, review strategies will have to begin valuing other design factors that relate to the inferential strength of a study, such as consistency between a priori theory and intervention effects, the consistency of process and outcome measures, and the consistency of outcome measures and qualitative research employed to interpret the outcomes. Questions to answer include the following: Is the study generalizable to the population from which the sample was selected? Are the results generalizable to other populations (i.e., to other communities with similar problems)? And beyond statistical significance, are the results consistent, meaningful, and relevant to the population?

The second major point of the May issue of *AJPM* cited above, that new interventions should *only* be implemented when accompanied by [rigorous] evaluation, needs restatement. We indeed hope for the day when all new interventions are evaluated and when the results of those evaluations are widely disseminated and used to drive continuous improvement of safety and health programs. However, we are far from this goal. In the meantime, the authors probably did not intend to suggest stifling the myriad of new intervention efforts

that occur across a landscape of more than seven million employer establishments in the United States.

There is a practical level of evidence available to employers and workers that will *have* to be acceptable. We should assist and encourage workplaces to incorporate simple evaluation methods into their intervention efforts. We also should explore the related issue of how such information is presently shared, and how it could be shared, so that the successes at one workplace can be disseminated to and adapted in others. What we need, in effect, is a system for surveillance of interventions implemented by employers and their workers, to track the occurrence of new safety and health strategies, as well as their effects on work-related injury and illness. This system would require a more balanced approach between experimental evaluation criteria (i.e., internal validity) and measures of generalizability (i.e., external validity) in evidence-based reviews in public health. Although this system might be seen by some as a retreat from the scientific steeples of RCTs, it would augur increased practicality in achieving our public health aims.

As mentioned earlier, the *AJPM* attention to intervention in occupational health is noteworthy and deserves creative discussion among researchers and health professionals in finding ways to improve and to emphasize research to understand the intervention process and its effectiveness. However, this committee asks that a more balanced approach to this research be appreciated, taking into account the variety of potential limitations to conducting strictly controlled research in the workplace environment.

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