

# **Intervention Effectiveness Research - Do we really want to know?**

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## **ABSTRACT**

To date, a variety of approaches to intervention have been developed to protect worker safety and health across a broad spectrum of industries. Although there have been measurable improvements in worker safety and health, only a few interventions, alone or in combination, have been systematically evaluated. Consequently, many interventions are undertaken based on faith and expert judgment without convincing evidence that these approaches are effective. However, there are excellent examples of interventions that have been evaluated and shown to be effective. This paper presents an overview of the issues, critically reviews intervention research activity in New Zealand and outlines a practical guide to intervention effectiveness research from the national policy level through to organisational based programmes.

## **INTRODUCTION**

For OHS practitioners, the goal of occupational safety and health interventions is to prevent disease and injury through combinations of techniques such as control technologies, exposure guidelines and regulations, worker participation programs, and training. The goal of intervention research is to determine the efficacy and effectiveness of these techniques and programs and to develop practical strategies that effectively reduce or prevent workplace injuries and illnesses. In 2001, the Intervention Effectiveness Research Team, established by NIOSH developed a conceptual model for intervention research in OHS (Goldenhar et al, 2001) (Fig. 1). The model suggests that the intervention research process is cyclical and progressive and involves three broad research phases of intervention development, implementation, and evaluation. In addition La Montagne et al (2004) expanded this model to describe a conceptual model that relates directly to occupational health interventions (Fig 2). As well as illustrating the intervention research process, it incorporates the differing levels and focus for evaluation. i.e. from the National or International Policy level, to the National Campaign level and the local/organisational programme level.

## **OHS INTERVENTION RESEARCH AT THE POLICY LEVEL**

Policy-level interventions include mandatory national regulations (e.g., Department of Labour regulations, European Union OHS directives) as well as voluntary guidelines and strategies recommended by professional, trade, research, or other authoritative groups (e.g., International Labour Organisation (ILO) Conventions,

International Standards Organization (ISO) Standards, and Australian New Zealand standards, Workplace Health and Safety Strategy for New Zealand to 2015).

La Montagne (2003) reviewed the nature and extent of OHS intervention research at the policy level and comments that despite the fact that OHS regulatory interventions are often challenged by various stakeholder groups—on one side for being too stringent and on the other for being too lax—there has been relatively little peer-reviewed research published on the evaluation of such interventions (Goldenhar et al, 2001; LaMontagne, 2000; Winder, 1999). What little there is tends to address regulatory or legislative more than voluntary policies and occupational safety more often than occupational health policy interventions. Policy-level interventions are particularly challenging to evaluate for many reasons, including the need for large-scale study, the lack of control over the intervention, and study design limitations imposed by ethical and other concerns (LaMontagne, 2000). For occupational health-focused policies in particular (e.g., regulations on occupational carcinogens), there are additional challenges in relating interventions to disease outcomes due to long latency periods from exposure to disease, non-work contributions to many disease that are also caused by working conditions, and other issues (La Montagne, 2003).

La Montagne (2003) suggests that policy-level interventions are usually developed based upon the best available evidence regarding risks and how best to control them. They thus have implied or explicit expectations about how requirements or recommendations will be implemented, and in turn, the effects of such actions will be on hazards and associated injury and disease patterns. Fundamental evaluation questions thus concern *implementation* and *effectiveness*, as outlined below:

1. Was the policy implemented as intended (e.g., employer implementation of requirements, regulatory enforcement)?; and
2. Did implemented measures result in decreases in hazards and health effects of concern?

Implementation studies are important complements to effectiveness studies, and can also be quite valuable in their own right. Their value is often under-estimated due to the prevalent view that evaluation is always about effectiveness. Effectiveness questions can be asked at three general levels (La Montagne, 2003a):

1. Was implementation of the policy associated with decreased exposures to the hazard of interest?
2. Was implementation of the policy associated with decreases in health outcomes of interest?
3. Did the policy ‘cause’ observed changes in exposures and health outcomes?

Studies at the first two levels are observational with the usual limitations on causal inference. For example, if an effectiveness evaluation study documents a decline in a hazardous exposure following a policy intervention on that specific exposure, it *suggests* but does not formally *prove* that the policy *caused* the decline. Combining qualitative and quantitative approaches, however, can greatly improve the interpretability of such observational studies (Zwerling et al, 1997; LaMontagne and

Needleman, 1996). Studies at the third level (did the policy ‘cause’ observed changes?) are rarely feasible due to the practical, ethical, and legal constraints of conducting randomized, controlled experiments in this context. For the sake of justifying policy intervention, sufficient levels of proof of policy effectiveness should be guided by these constraints. A sensible and economical approach to evaluating OHS interventions (of all types, including policy) has been proposed in which qualitative and quasi-experimental studies would be conducted, followed by—where both necessary and feasible—randomized, controlled trials ((Zwerling et al, 1997).

## **OHS INTERVENTION RESEARCH AT THE PROGRAMME LEVEL**

La Montagne and Shaw (2004) define program evaluation as:

“the systematic collection and analysis of information to allow informed decision making about a program or activity. Evaluation aims to identify the lessons learnt from OHS interventions, in order to establish improved approaches to interventions in the future. This can include changes to the content and structure of interventions themselves as well as improved implementation strategies” (La Montagne and Shaw, 2004). They suggest that evaluation can be done at different times of an intervention and to provide different sorts of information. The best types of evaluation provide information that helps improvement – information for action. Evaluation can tell you about:

- How well the intervention was implemented – *process and formative evaluation*. These types of evaluation will answer questions like:
  - How well did we implement the activities?
  - Did we get the right stakeholders involved?
  - How is the intervention affecting the targets?
  - How well did the intervention address the identified problem?

Process evaluation can be done during an intervention or after its completion. Formative evaluation can also be done while the intervention is happening—the distinction here is that whatever is learned is applied in an on-going way to help fine tune the intervention and to ensure reliable data. Process and formative evaluation are relatively less resource intensive than effectiveness evaluation (La Montagne and Shaw, 2004).

- Whether the intervention had the desired outcomes – *effectiveness evaluation*. This type of evaluation will answer questions like:
  - To what extent did the intervention achieve the expected outcomes?
  - Did the intervention meet the identified needs?
  - Did we get value for money from the intervention?

Effectiveness evaluation requires the most time and resources and can only be finished after an intervention has been completed (La Montagne and Shaw, 2004).

The framework developed by La Montagne and Shaw (2004), lays out a systematic process for evaluating occupational health & safety (OHS) intervention programs. It is designed for use by practicing professionals working in government OHS agencies. To make it most accessible to this audience, there is a particular emphasis on OHS

policy interventions (i.e., regulatory standards or other interventions). However, this framework is applicable to any OHS intervention (e.g., worker OHS training programs, medical screening tests for occupational diseases, engineering solutions to reduce hazardous exposures). The intervention evaluation framework focuses on answering three questions: (1) what is the rationale of your intervention? Or, put more simply, how is it supposed to work?; (2) What are the questions you want to answer about this intervention?; and (3) What are the appropriate evaluation methods, designs, or tools that can be used to answer your questions? In addition, Dannenberg and Fowler (1998) identified a number of issues and barriers that need to be considered in the design and conduct of evaluations of interventions.

Programme practitioners find evaluation to be one of the most uncertain elements of their working environment. However, these difficulties are largely an artefact of the way evaluation is approached. Attempts to focus on evaluation as an entity devoid of context, or on evaluation as an endpoint in itself, will inevitably lead to problems. In reality, evaluation is not so much an endpoint but a means to an end.

## CONCLUSIONS

Programme evaluation is best understood simply as the process of getting answers to essential questions about a programme. Indeed, it is a classic example of an area where the issue is not so much ‘what is the answer?’ but ‘what is the question?’ and while practitioners and evaluators continue to underplay the importance of the question at the expense of a hurried search for an answer then programme evaluation will continue to be a problem for all.

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Figure 1 – Intervention Research in OHS: A Conceptual Model

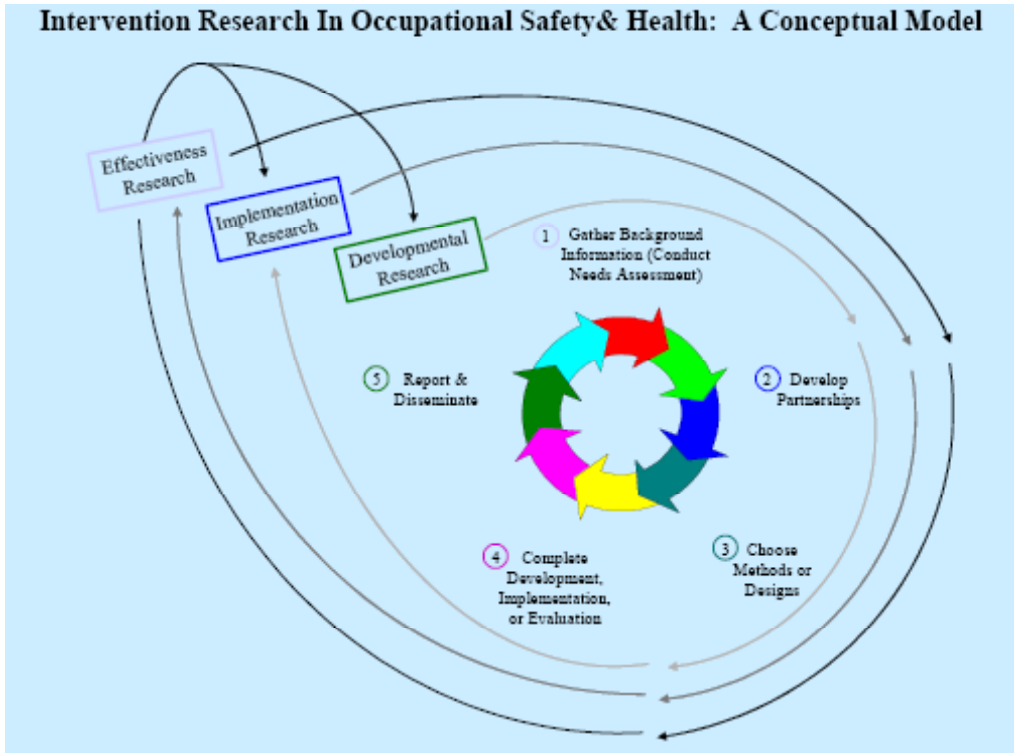


Fig 2. – Intervention in Occupational health – A Conceptual Model

