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

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# Introduction

- Evaluating Interventions
- Intervention Research
- Programme Evaluation
  - **OHS Policy Intervention Research**
  - Evaluating OHS Policy Interventions
  - Process and Formative Evaluation
  - Effectiveness Evaluation
  - Barriers to Conducting Evaluations



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# Evaluating Interventions

- The goal of occupational safety and health interventions is to prevent disease and injury through combinations of control strategies.
- The goal of intervention research is to determine the efficacy and effectiveness of these strategies and programmes



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# Intervention Research

- Intervention research is the testing and evaluation of interventions, programs, and policies.
- 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.



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## Intervention Research

- Consequently, many interventions are undertaken based on faith and expert judgment without convincing evidence that these approaches are effective.
- There are excellent examples of interventions that have been evaluated and shown to be effective.



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# Intervention Research

- Although many intervention strategies have been applied to industrial settings, knowledge about what works best is limited.
- Many questions remain unanswered.
  - What are the best techniques to evaluate the effectiveness of implemented control technologies?
  - What are the barriers to the acceptance of new control technologies and approaches to eliminating or altering these barriers?
  - What factors motivate the voluntary adoption of protective work practices?



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# Intervention Research

- What roles do researchers, consultants, trainers, worker organizations, and industry trade groups play as partners in intervention efforts?
- What organizational and economic factors predict success in prevention programs, and how can programs be tailored to take account of these factors?
- How can intervention efforts target areas of greatest need?
- Why do managers and workers in some organizations implement occupational safety and health programs when others do not?



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# Intervention Research

- Intervention research is a new and multidisciplinary field that requires skills and disciplines not traditionally applied to occupational safety and health research.



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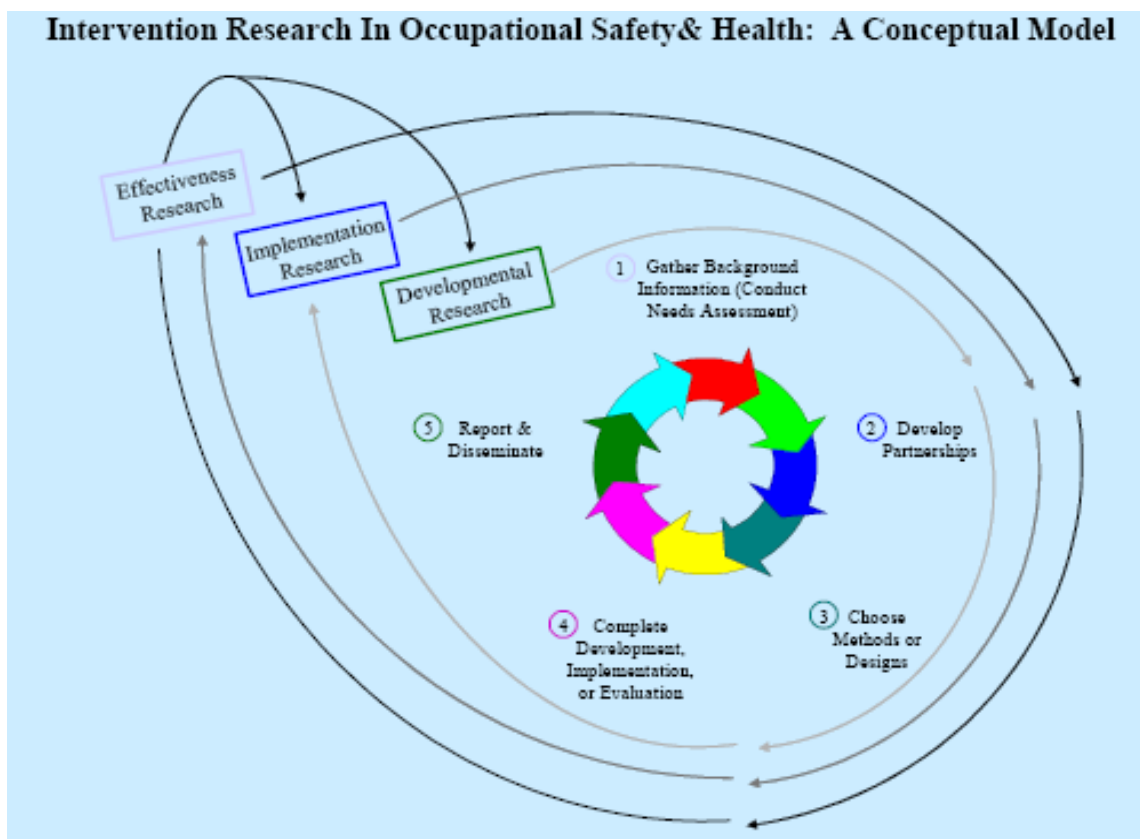
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# Intervention Research

- In 2001, the Intervention Effectiveness Research Team, established by NIOSH developed a conceptual model for intervention research in OHS (Goldenhar et al, 2001).
  - The model attempts to:
  - Provide an integrating framework for diverse activities;
  - Articulate relationships among various types of intervention research;
  - Facilitate assessment of the current state of the field in order to guide strategic planning (e.g., specific requests for intervention research proposals); and
  - Develop common language to facilitate communication.



### Figure 1 – Intervention Research in OHS: A Conceptual Model





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## **Intervention Research in OHS: A Conceptual Model**

The model suggests that the intervention research process is cyclical and progressive and involves three broad research phases:

- intervention development,
- implementation, and
- evaluation.

It includes a set of five tasks that are important in any intervention research study:



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## **Intervention Research in OHS: A Conceptual Model**

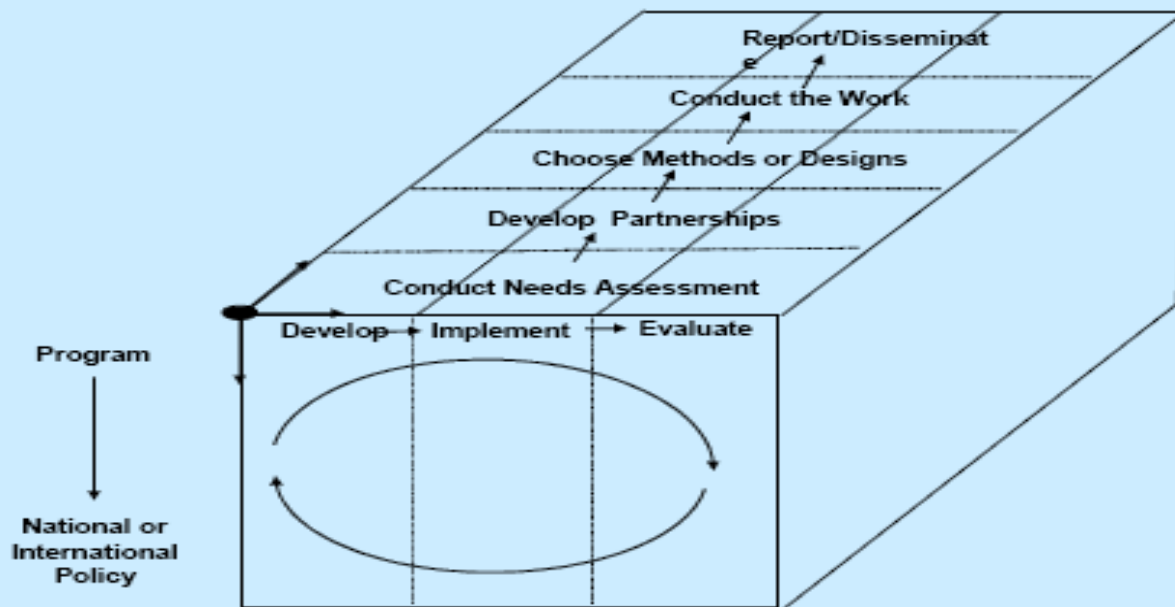
- (1) gathering background information and conducting needs assessment on the problem and the range of possible intervention strategies,
- (2) developing partnerships with relevant stakeholder groups,
- (3) choosing appropriate research methods and study designs,
- (4) conducting the research, and
- (5) reporting on and disseminating findings.

Finally, intervention research can be conducted at levels ranging from simple worksite programs to national or international policy (Goldenhar et al, 2001)



La Montagne et al (2004) expanded this model to describe a conceptual model that relates directly to occupational health interventions (Fig 2).

### Intervention In Occupational Health - A Conceptual Model





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# Programme Evaluation

- In reality, evaluation is not so much an endpoint but a means to an end.
- Programme evaluation is best understood simply as the process of getting answers to essential questions about a programme.
- It is a classic example of an area where the issue is not so much 'what is the answer?' but 'what is the question?'
- 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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# Programme Evaluation

- The confusion over the nature of evaluation has led to programme evaluations often being poorly resourced and poorly conducted.
- Defence of this situation is expressed in terms of there being limited resources available for evaluation.
- In a fixed resource environment, however, there is an even greater imperative to adequately evaluate all programmes to ensure effective use of the funds that are available for prevention activities.



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# Programme Evaluation

Evaluation questions fall into one of several categories.

- The first category includes the ‘What (and who)’ questions, which are about the qualitative nature of things. Examples include: ‘Who was involved?’, ‘what strategies were used?’, ‘what role did the project officers play?’.



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## Programme Evaluation

- The second category includes the ‘How much, how many?’ questions, which explore the magnitude of an aspect of the programme. Examples include: ‘How many community members were contacted?’; ‘How much did the programme cost?’.



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# Programme Evaluation

- The third category of questions is the 'relationship' questions, which explore the associations between programme factors. Examples of this final group include: 'What is the association between the programme activity and changes in risk factor prevalence?'; Did the programme lead to a reduction in the incidence of injury?'



## Programme Evaluation

- Appropriate methodology for exploring answers to research questions is determined by the nature of the question and to a large extent follows from the category in which the question sits.
- ‘What?’ type questions are answered using qualitative methodology;
- ‘How many?’ type questions are answered by descriptive quantitative methods and the



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# Programme Evaluation

- ‘Association/relationship’ type questions are answered either by analytic quantitative methods when it is a quantitative association that is being measured, or qualitative methods when it is the qualitative relationship that is being explored.



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# Programme Evaluation

- Evaluations of programmes aim to collect sufficient information on the intervention itself, the context of the implementation, the interaction between the intervention and this context and the ultimate programme outcomes, such that the evaluation will provide the stakeholders with the information needed to support policy and practice decisions arising from the programme (Rychetnik et al. 2002).



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# Programme Evaluation

- The task of a programme evaluation expressed at its simplest terms - is to measure the extent to which the programme made a difference in the specified community.
- As with scientific processes the logic of an evaluation follows a simple sequence.



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# OHS Policy Intervention Research

- 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).



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# OHS Policy Intervention Research

- La Montagne (2003a) 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



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# OHS Policy Intervention Research

- 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).



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# OHS Policy Intervention Research

- 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, 2003a).



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# Evaluating OHS Policy Interventions

- La Montagne (2003a) 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.



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# Evaluating OHS Policy Interventions

- Fundamental evaluation questions thus concern *implementation* and *effectiveness*:
  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?



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# Evaluating OHS Policy Interventions

- 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.



## Evaluating OHS Policy Interventions

- 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?



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# Evaluating OHS Policy Interventions

- Studies at the first two levels are observational with the usual limitations on causal inference. e.g. 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).



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# Evaluating OHS Policy Interventions

- 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.
- 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).



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# 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).



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## **Evaluating health and safety programmes**

- 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:



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## Process and Formative Evaluation

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?



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## Process and Formative Evaluation

- 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.



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## Effectiveness Evaluation

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.



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## **What is the rationale of the intervention you want to evaluate?**

- What is the program or policy or intervention?
- How is it supposed to work?
- Who or what is supposed to change?
- Why?
- Over what time period?

You might be surprised to find that this is the most difficult but most illuminating part of the entire evaluation process.



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## **What are the specific evaluation questions about the intervention?**

- How well did we implement the activities of the intervention?
- Did we get the right stakeholders involved?
- How is the intervention affecting the targets?
- How well did the intervention address the identified problem?
- To what extent have the objectives of the intervention been attained?
- Has the intervention resulted in unanticipated consequences? For better or worse?
- How have the activities of the intervention affected these outcomes?
- Has the intervention met identified needs?



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## **Steps for evaluating health and safety programmes**

- Evaluation should be part of workplace OHS programmes from the start.
- Evaluation isn't necessarily expensive or complicated.
- There are four steps to follow:



# Evaluating health and safety programmes

## 1. Form a team

Evaluations are best done by a team. Keep in mind that employees are often the best source of information about the workplace. The team should include people who are :

- Affected by the safety and health change
- Responsible for implementing and maintaining the change, and/or
- Involved in future decisions about the change



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# Evaluating health and safety programmes

## 2. Collect relevant data

Collect accurate data on workplace safety and health. 3 types of data:

1. Conditions before the change
2. Information about how the change was put in place
3. What happened after the change was made.



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## Evaluating health and safety programmes

Ways of collecting data:

- Records
- Surveys
- Interviews
- Focus groups
- Observations
- Environmental measures



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## Evaluating health and safety programmes

### 3. Analyse data

- Data must be systematically analysed to determine whether the change is effective.
- Simple or complex depending on the questions asked, completeness of data & experience of team.



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## Evaluating health and safety programmes

### 4. Share your results

- Share results with those affected by change. Present the findings, get feedback
- Maintain confidentiality, do not identify individuals/ groups. Combine results.



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### Program logic

Describe the problem	Design the intervention	Activities	Targets	Short term impacts	Long term outcomes
<ul style="list-style-type: none"><li>■ What is the problem?</li><li>■ What do we know about how we could deal with it?</li><li>■ Who are the stakeholders?</li></ul> <p>Do we know enough to design the intervention? Yes – go to next step No – do more research</p>	<ul style="list-style-type: none"><li>■ What can we do about the problem in the circumstances?</li><li>■ How can we get it implemented?</li><li>■ Who can we work with?</li></ul>	What are you going to do?	How will the activities change things in workplaces?	What impact will these changes have?	What long term outcomes will these impacts lead to?
TIME <span style="float: right;">→</span>					



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# Barriers to conducting evaluations

## WELL DEFINED GOALS

- One barrier to evaluation may be the absence of clearly defined goals and objectives for the intervention. For example, it would be difficult to evaluate an advertising campaign that advised teenagers to “drive carefully”.

## SAMPLE SIZE

- Because many types of injuries are relatively rare, a large sample may be needed to provide sufficient statistical power to detect a change in injury rates due to the intervention. To illustrate, if suicides occur on college campuses in one of 10 000 students per year, then an evaluation of a suicide prevention program would need to involve hundreds of thousands of students.



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# Barriers to conducting evaluations

## RESOURCES

- Financial support, appropriate expertise, and adequate staff time are all required to conduct evaluations. Depending on the evaluation design, the resources needed for an evaluation may range to perhaps 20% of the total cost of the intervention. Ideally, a budget for the cost of the evaluation should be, but often is not, established during the initial planning of the intervention.

## TIME FRAME

- The effect of an intervention may differ in the long term compared with the short term, so both should be examined. Educational campaigns and enforcement efforts often increase knowledge and affect behaviour in the short term, but additional evaluation is needed to assess whether short term successes are sustainable in the long term.



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# Barriers to conducting evaluations

## SIMULTANEOUS EVENTS

- It is often difficult to separate the effects of an intervention from other simultaneous related events, a phenomenon known as the "history effect".

## RELIABILITY/VALIDITY

- It is necessary to establish the reliability and validity of survey instruments and other outcome measures used.

## TIME LAG

- For some settings, it is important to take into account the time lag between intervention and effects of intervention.



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**Thank you**