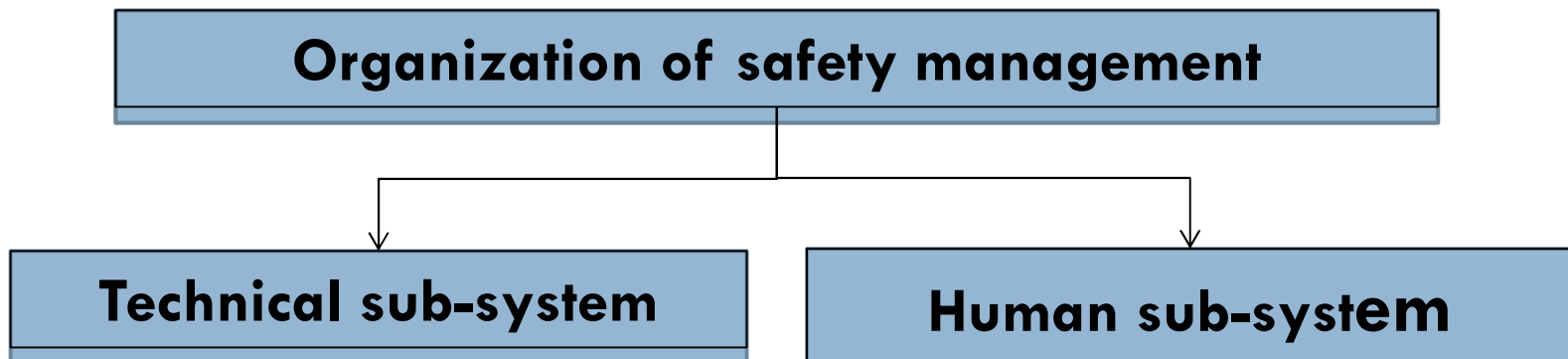


PRINCIPLES OF EVALUATION OF SAFETY INTERVENTIONS

Alfredo Celis

Definitions of safety intervention

- A **safety intervention** is defined as an attempt to change how things are done in order to improve safety.
- Levels of intervention.



Levels of intervention

- Management
 - Policy
 - Procedures
 - Organizational structure
 - Communications mechanisms
- Human
 - Safety attitude and preceptions
 - Knowledge
 - Motivation
 - Behavior
 - Safety Culture
- Technical
 - Physical settings
 - Machine design
 - Protective

Definitions of evaluation

1. Evaluation is the systematic assessment of the worth or merit of some object.
 2. Evaluation is the systematic acquisition and assessment of information to provide useful feedback about some object.
 3. A systematic inquiry that determines whether an intervention or program has had the intended effect.
- Systematic—Useful feedback—Intended effect.

Why evaluate safety intervention?

- To know if your safety program, or any component of the program, really works
 - ▣ To monitor progress toward the program's goals
 - ▣ To determine whether program components are producing the desired progress on outcomes
 - ▣ To permit comparisons among groups
 - ▣ To justify the need for further funding and support
 - ▣ To find opportunities for continuous quality improvement
 - ▣ To ensure that effective programs are maintained and resources are not wasted on ineffective programs

Types of evaluation

- Developmental (Needs assessment)
- Formative (Process of implementation)
- Summative (Effectiveness of outcome)
- Cost measurement

What developmental evaluations can answer

- What changes need to be made to improve safety?
- What are people perceptions about current safety interventions?
- What should a new safety intervention consist of?
- Are there certain groups that have specific safety needs?
- What might be obstacles to making safety changes?
- Will people engage into a new safety intervention?

What formative evaluation can answer

- What are the specific components of the intervention as implemented?
- Is the intervention being implemented as intended?
- Who is accepting and/or rejecting the intervention?
- How could the implementation be better or what implementation procedures need to be changed?
- What is the immediate feedback from participating people?

Questions that summative evaluations can answer

- To what extent does the intervention reduce injuries, disability, or fatalities?
- To what extent does the intervention reduce exposure and level of exposure to hazardous conditions?
- Does the interventions improve people safety culture?
- How has the intervention change the attitude, knowledge and behavior of people?

Purpose of cost measurement evaluations

- To determine the net cost of an intervention relative to its health effect (cost-outcome analysis)
- To compare different intervention alternatives using cost-effect ratios (cost-effectiveness analysis)
- To compare different intervention alternatives using net benefits (cost-benefit analysis)

Framework for program evaluation in public health (CDC recommendation)

Steps in evaluation practice	Standards for effective evaluation			
	Utility	Feasibility	Propriety	Accuracy
Engage stakeholders				
Describe the program				
Focus the evaluation design				
Gather credible evidence				
Justify conclusions				
Ensure use and share lessons learned				

Steps in Evaluation Practice, 1

- Engage stakeholders
 - ▣ Involved in, affected by the program and primary users of the evaluation.
- Describe the program
 - ▣ Need, expected effects, activities, resources, stage, context, logic model.
- Focus the evaluation design.
 - ▣ Purpose, users, uses, questions, methods, agreement.

Steps in Evaluation Practice, 2

- Gather credible evidence
 - ▣ Indicators, sources, quality, quantity, logistics.
- Justify conclusions
 - ▣ Standards, analysis/synthesis, interpretation, judgment, recommendations.
- Ensure use and share lessons learned.
- Design, preparation, feedback, follow-up, dissemination.

Standards for Effective Evaluation

- Utility
 - ▣ Serve the information needs of intended users.
- Feasibility
 - ▣ Be realistic, prudent, diplomatic, and frugal.
- Propriety
 - ▣ Behave legally, ethically, and with regard for the welfare of those involved and those affected.
- Accuracy
 - ▣ Reveal and convey technically accurate information.

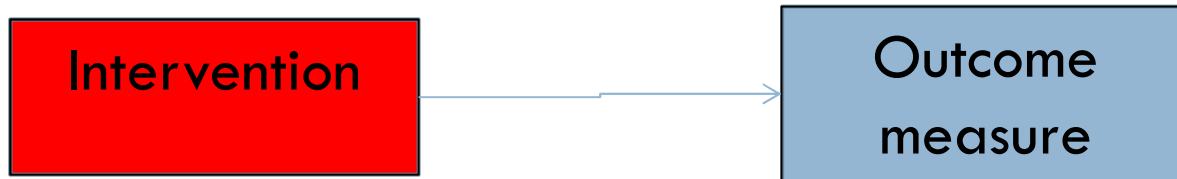
Planning from the start

- Golden rule: Intervention and evaluation should be planned simultaneously
- Defining the scope of the evaluation
 - ▣ Overall purpose of the evaluation
 - ▣ The main questions the evaluation should answer
 - ▣ Available resources (financial, personnel, assistance)
 - ▣ The timetable, including deadline for the evaluation results
 - ▣ Management support
- **REMEMBER:** Research seeks to prove; evaluation seeks to improve

Evaluation scheme

Evaluation scheme			
Design	Data	Measures/indicators selections & collection	Other considerations
<ol style="list-style-type: none">1. Non-experimental2. Quasi-experimental3. Experimental	<ol style="list-style-type: none">1. Quantitative2. Qualitative	<ol style="list-style-type: none">1. Baseline2. Short-term3. Intermediate4. Long-term	<ol style="list-style-type: none">1. Who will participate2. How many will participate3. Data analysis

Before-and-after design



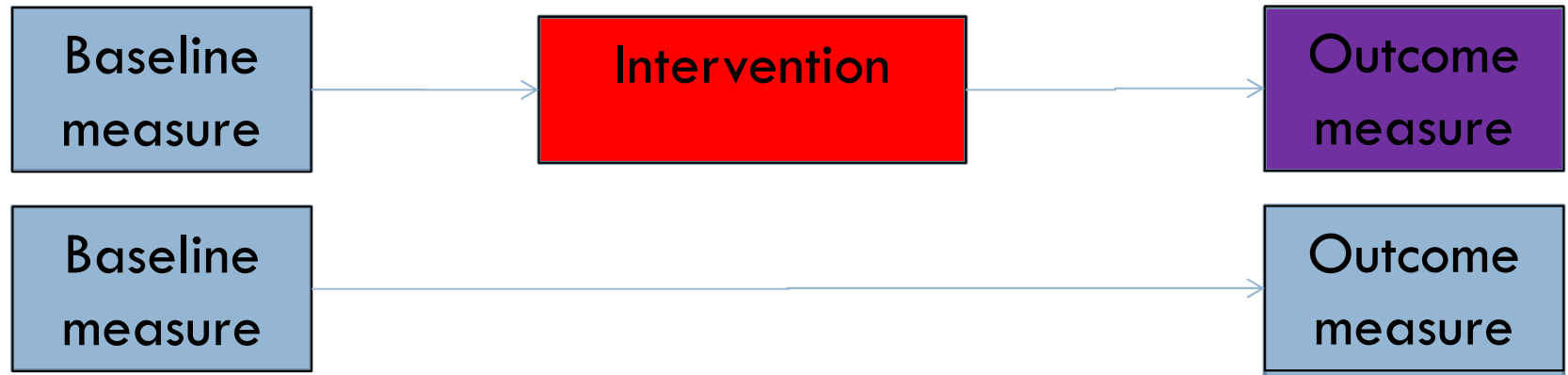
- Major weakness: Cannot be sure if the outcome measure would be different without the intervention.

Before-and-after design



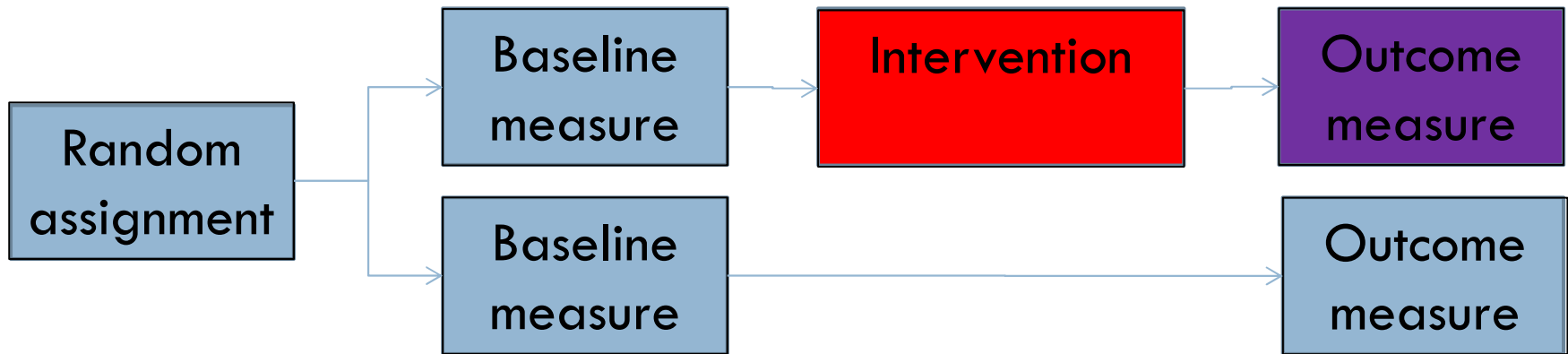
- Most useful in demonstrating the immediate impacts of short-term interventions.
- Over time, more circumstances can obscure the long-term effects of the interventions.

Before-and-after design



- Adding a control group (not getting intervention) reduce the likelihood of history effects.

Experimental design



- Random assignment greatly reduces the likelihood of selection effects.

Methods of collecting qualitative data

- Interviews
- Focus groups
- Questionnaires with open-ended questions
- Observation
- Document analysis

Measurement/indicators selection: short-term/intermediate evaluation

- Awareness
- Attitudes
- Knowledge
- Behaviors
- Intervention component-specific perceived quality and effectiveness

Measurement/indicators selection: longer-term evaluation

- Number of injuries
- Number of exposures
- Level of severity
- Health care claims
- Cost/benefit

Bibliography

- National Safety Council (2004). Safety intervention evaluation: a systematic approach. Available at http://www.acgih.org/events/ControlBand/Thomas_SafetyIntervention.pdf
- Introduction to evaluation (2009). Available at: <http://www.socialresearchmethods.net/kb/intreval.htm>
- CDC (1999). Framework for program evaluation in public health
- CDC (2005). Introduction to program evaluation for public health programs: a self-study guide.
- Robson LS *et al* (2001). Guide to evaluating the effectiveness of strategies for preventing work injuries: how to show whether a safety intervention really works.