

“So What?”

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I can't understand why people are frightened of new ideas. I'm frightened by old ones.

John Cage

The more original a discovery, the more obvious it seems afterward.

Arthur Koestler

“So what?”—is a short and simple question. But, it is an essential question that should constitute an important element of any evaluation or research undertaking. Its answer must be addressed in the “Discussion” section of any paper submitted for publication. “So what” basically asks, “What difference did the intervention/response make?”...and, “to and for whom?” In other words, “What has been the *impact* of what we have done?” This is relevant especially for the person or society that the intervention was designed to help. A major focus in health today is to examine the *health impacts* of an intervention. An *impact* is the effect or impression of one thing on another.¹ The term “impact” often is confused and is used interchangeably with the terms “output”, “outcome”, and/or “effect”. Similarly, “goals” and “objectives” of an intervention/response have been used interchangeably. The inappropriate use of each of these terms tends to confound our science and challenge our ability to compare information and develop best practices.

In order to sort the use of these terms, it is helpful to view an intervention/response as production (transformation) process by which the current status is changed by the implementation (application) of the intervention.² Recently, this process has been translated from industry to the social sciences and has been labeled the “Logic Model” (Figure 1).^{3,4} This model can be applied to all evaluations and research regardless of the setting in which the intervention being studied was performed.

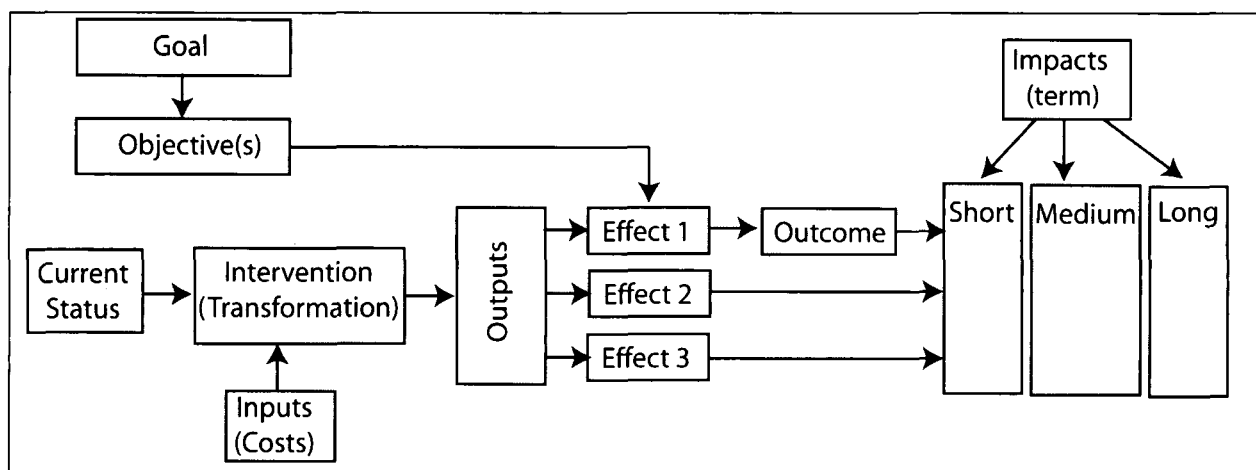
In order to achieve the new status, actions are undertaken and resources are consumed. The resources consumed by the transformation process are the costs; these costs may be human, equipment, material, environmental, economic, and/or opportunity. The *outputs* of the transformation process are the products of the process, i.e., the energy, information, work and/or the product(s) produced by the process.^{5,6} The outputs from the transformation process may have various *effects* on the status of the individual, population, the environment, and/or the economy for which the intervention/response was initiated. These effects of the outputs generate an *impact(s)* on the pre-intervention status. The resulting impacts are the “so whats” of the intervention—what differences did the intervention make for/on the affected individual or society? The impact(s) resulting from an intervention may be positive, negative, or a combi-

nation of both. Positive impacts improve the pre-intervention status and most often are called “benefits”. But, other effects may have compromised the status and thus, produced a negative impact. In some instances, the negative impact(s) may outweigh the benefit(s) (positive impact(s)).

During an emergency, a crisis, or a disaster, all responses (interventions) must be directed towards meeting a defined need or set of needs of the affected person or society. The need(s) is synthesized into an operational plan that defines the goal(s) that should be accomplished to meet those defined needs. It is towards these goals that interventions are selected and directed. The *objective(s)* of each intervention selected should describe steps to move the status of the affected person or society towards the defined goal. The *outcome* of an intervention, then, is whether the intervention has achieved all or part of the stated objective—it is one of the effects of the outputs of the transformation process.

For example, assessments indicate that persons in a camp for an internally displaced population are at high risk for an outbreak of cholera. Thus, the goal must be to prevent such an outbreak from occurring. To accomplish this goal, an intervention is selected that has as its objective to immunize 3,000 of the camp residents against cholera. The intervention of immunizing the residents is successful in immunizing 3,000 individuals. Resources are directed to accomplish this objective, and 3,000 persons receive the immunization. Thus, the objective of the intervention was “achieved”—the outcome has met the objective for which the intervention was designed. However, if an outbreak of cholera still occurs within the camp, the goal of preventing an outbreak of cholera was not reached despite the fact that the outcome of the intervention was achieved. On the other hand, if an outbreak of cholera does not occur, it *may* have been related to the immunizations—or perhaps the outbreak would not have occurred without the immunizations. However, suppose the immunizations resulted in the deaths of many persons; although the objective of the intervention was achieved, the status of the population actually deteriorated—implementation of the intervention resulted in a negative impact. The negative side effects of the immunization process may outweigh the probable benefits (positive impact) of the immunization process. Thus, merely achieving the desired outcome of an intervention does not define its impact, despite the achievement of the outcome of the intervention. The answer to the question, “So what?” defines the impact.

Unfortunately, achieving the objectives of an intervention has been the only reported end-point of the evaluation of many interventions.⁷ Often, these are reported in terms of quantities or numerical measurements (the number of



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Table 1—Transformation process (production function) and logic model for evaluation of interventions/responses to emergencies, crises, and/or disasters

procedures accomplished or numbers of patients treated, etc.) However, such “achievement” indicators do not describe the impact of an intervention/response. The completion of an intervention or the achievement of an objective is not an adequate end-point of any useful evaluation of an intervention/response. Achievement of all or part of the stated goal may be an important end-point so long as the negative impacts (side effects) of the intervention do not render the overall pre-intervention status worse.

Impacts of interventions/responses may be the direct or indirect effects of the intervention. Little attention has been focused on the indirect effects of the intervention/response. Identification of all of the impacts of the interventions must be included in an evaluation of any intervention/response. What may seem to be an ideal outcome with positive direct impact from an intervention may be outweighed by those often unanticipated effects that were not directly related to the intervention.

As stressed in the logic model, consideration of the impact(s) of an intervention must be given not only to the immediate, short-term impact(s), but also to the medium- and long-term impacts. These should constitute parts of all evaluations. In part, this depends on the defined goal—the goal may be short-, medium-, or long-term, but the medium and long-term impacts always should be considered in terms of the value of the intervention to the affected person or society. In sudden-onset disasters, it is not common to go back to identify the longer-range impacts.

Paramount to the impact evaluation is the selection of the most appropriate *indicators of function* to monitor the progress of any intervention/response. Thus, not only must the goals and objectives be defined, but the indicators that best reflect the attainment of the respective goal and objectives must be identified and monitored. The chosen indicators will determine if the objectives are accomplished. The indicators for the goal may be the same as those for the objectives, but generally goals are of a higher order. Indicators must be selected and monitored that also may reflect the other possible effects (positive and negative) of the interventions. The appropriateness of the selected indicators is termed their *construct validity*. Indicators may be valid or invalid for determining the effects, outcomes, and impacts of any intervention. Selection of the appropriate indicators of function is crucial to the evaluation of the impacts of any intervention.

This production/transformation process model should be woven into any reports of an intervention. The answers to “So what” can be obtained only through the performance of rigorous evaluation. It is important to remember that evaluations are quality improvement processes; evaluations should not be viewed or used as punitive. Evaluations are the stuff of which science is built. The answer should help to guide us in future endeavors. No intervention is perfect—something always can be identified that will make it better the next time it is used.

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