

Chapter 4: Evaluation and continual improvement

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Chapter overview

The evaluation and continual improvement components of the SIMS cycle include activities to analyze the results of the SafeWell program, determine whether goals and objectives are being met, identify what has been successful and what still may need improvement, and provide information for future decision-making. Typically, evaluation occurs at different points throughout the program.[1, 2]

It is important to set specific goals for the evaluation, then to choose tools to match and measure progress toward them. The organization may want to focus on one purpose or objective, or may want to focus on different ones over time. “Chapter 2: Program Planning” includes a discussion of strategies for choosing goals, objectives, and specific tools for the assessment process that may be helpful in preparing for the evaluation phase of SafeWell also.

This chapter covers:

- Purposes of evaluation
- Strategies for evaluation
- Existing evaluation resources and tools—from simple to comprehensive

Purposes of evaluation

The descriptions below of the purposes of evaluation are summarized from Pronk and the Institute of Medicine (IOM).[3, 4] These references summarize the purpose(s) of evaluation as being for:

- Accountability
- Decision-making
- Improvement
- Surveillance, including longitudinal analyses and knowledge discovery

Evaluation for accountability

A basic purpose of evaluation is to assess whether the program implemented has resulted in desired changes, goals/objectives being achieved, or whether there has been progress toward meeting such goals. For this type of evaluation, organizations may focus on only a few vital measures, tightly linked to program objectives. These results may need to be reported periodically to management and/or outside funding/investor sources for accountability purposes, so it is important that the measures be valid (i.e. truly measuring the change) and reliable (i.e. able to measure the change consistently/repeatedly).

Evaluation for decision-making

Evaluation for decision-making purposes uses data that contribute to an understanding of program costs and benefits, prioritization of goals and objectives, and need and demand at the worksite.[3] For example, drivers of health care costs, units with elevated health and safety hazards, and findings from employee needs and interests surveys may influence decisions about the types of programs or policies offered at the workplace. Examples of tools to assess these topics are provided in “Chapter 2: Program Planning.”

In order to make decisions about future efforts and resource allocation, managers need timely, valid, and reliable data tailored to meeting objectives. The evaluation of data for decision-making should be based on management/organizational schedules for review or major decisions (often annually). There may also be a need for data to estimate future states, such as anticipated returns on investment. [4]

The SIMS Steering Committee (see “Chapter 1: Providing the foundation”), including employee representatives, could be involved in decision-making, as well as in reporting decisions to the broader workplace population. Ultimately the decision has to be made about the extent to which the SafeWell program has been adequately implemented, is suitable for the organization, has been effective, and how it may be continued and improved. Management review of the appropriate data leads to this kind of decision-making.

Evaluation for improvement

Data that can impact improvement often point to barriers, opportunities, and other process-related issues that can affect programs and people. Measurements for this type of data should be simple, easy to implement, and reported frequently. The Plan-Do-Study-Act cycle of planning a change, implementing it, and studying and acting upon the results is a good example of this evaluation for improvement.[4] For instance, as part of the assessment and prioritization process (see “Chapter 2: Program Planning”) an organization will focus on developing one or more priorities. These priorities may be determined from data that the worksite collects that have identified the problem(s). A program can be introduced that addresses priorities chosen, the process of program implementation may be tracked, and whether change has taken place may be measured

after a period of implementation. If barriers to program implementation arise, an organization can determine whether any mid-course corrections need to be made to improve the program, leading to the process of continual improvement.

A real-world example of evaluation for improvement is provided by Dartmouth-Hitchcock Medical Center (D-H) in Lebanon, NH. It is included here as a case study of how a large health care organization has tried to improve the health of its workforce using an integrated approach by targeting “at-risk departments”—i.e., those units where needs are the greatest—with the support of its Live Well/Work Well Program. D-H has used principles of continual improvement in its implementation of Live Well/Work Well.

Case study: Evaluation for improvement at D-H

Using data about at-risk units/departments as an opportunity to improve worker health

The Dartmouth-Hitchcock Medical Center (D-H) launched its Live Well/Work Well (LWWW) program in 2009 with the vision of achieving the healthiest workforce possible. LWWW is a comprehensive program that integrates occupational safety and health (OSH), worksite health promotion (WHP), and disease management. As an example of its integrated approach to worker health, this case describes how D-H has coordinated a traditional OSH strategy of incident reporting (a data collection effort) with providing opportunities to improve the health and well-being of workers and their departments through programming, evaluation, and continual improvement. This approach to focus on integrated interventions is based on the likelihood that work areas with high levels of work injury probably also carry higher levels of workplace stress and have employees with lifestyle risk factors influenced by the work environment.

Foundational precepts of LWWW

The LWWW program’s foundational precepts are that a healthy workforce is a safer workforce and a safe workforce is a healthier workforce.

Collecting the data: D-H incident investigations

The purpose of an occupational safety and health (OSH) incident investigation is to identify specific locations and work activities that pose the greatest risk to employees in terms of injuries and illnesses, and to target needed corrective action effectively. At D-H, the data is collected through an on-line electronic Employee Report of Injury and Near-Miss Reporting System (EROI). This system encourages employees to report near-miss incidents at the time of occurrence on a form called a “Yikes Report.” On-the-job employee injuries or illnesses are also reported on-line and referred to as “Ouch Reports.” All incidents meeting certain thresholds receive an immediate review by the D-H Safety and Environmental Programs (SEP) Department and then are triaged for a follow-up assessment based on severity.

Analyzing the data and prioritizing for greatest need

The incident data and other data (e.g. Liberty Mutual’s Loss Prevention Report) assist the SEP in tracking trends by workgroup, supervisor, shift, and job-type. The SEP uses this

data to identify “at-risk” units/departments¹, which are defined as a rate of work-related incidents (injuries, illnesses, and near misses) that exceed the OSHA recordable rate at D-H. “At-risk” departments are identified then as targets for an integrated intervention. In 2010, about 90 percent of all incidents occurred in 10 percent of D-H departments.

Implementing follow-up action for “at-risk” departments

After a department has been determined to be “at-risk,” the SEP posts the information electronically on an intranet site and sends a written communication to that department’s director. The letter provides a summary of incident rates for all “at-risk” departments in D-H. The department is expected to partner with LWWW in a comprehensive assessment of work environment and organizational factors influencing health, and an action plan aimed at both eliminating or mitigating hazards, and improving overall health and well-being.

After the initial written communication, a one-on-one meeting is organized by the SEP with each “at-risk” department director. The department’s incident profile and preventive programs and procedures are presented and discussed. In addition, the SEP explains specific follow-up activities to be launched for the department that follow a comprehensive approach to protect the safety, health and well-being of employees. The approach addresses both OSH and WHP at environmental, organizational and individual levels. The activities aim to support the process of continual improvement through infrastructure development; data collection, analysis, and prioritization; program implementation; and rating the effectiveness of corrective action. Specific activities that occur in conjunction with the SEP include:

- **Infrastructure development:** Identifying a department champion to spearhead the unit’s OSH and WHP activities. This champion will participate in a department-based OSH-Wellness Committee including leadership and non-leadership staff members. The Committee will meet quarterly at the D-H Partners in Health, Environment, Wellness and Safety (PHEWS) Committee to address and share the department’s successes and challenges. .
- **Data collection:** Tracking incidents on a quarterly basis and helping the SEP Office conduct investigations to identify the root causes of incidents and level of specific risks.
 - Conducting industrial hygiene surveillance: Focused exposure assessment evaluations such as job hazard analyses and exposure surveys can identify, evaluate, and control employees’ exposures to chemical, physical, and biological hazards.
 - Improving incident reporting and providing rate-based injury data to better compare outcomes.
 - The EROI prompts a comprehensive investigation of work environment and organizational factors that influence workgroup health (personal and occupational).

¹ An “at-risk” entity can be either a unit (e.g. an in-patient area such as orthopedics), or a department (e.g. engineering) that spans the entire hospital. For the sake of brevity, the term department will be used to connote an “at-risk” unit and/or a department.

- The EROI prompts a referral to individual and population health promotion as well as health protection
- **Implementation:** Conducting focused corrective actions to mitigate unit exposure risks. SEP provides assistance in the development of alternate work opportunities for injured staff.
 - If an employee goes to the OSH clinic at D-H because of a work-related injury or illness, s/he is also assessed for, and when appropriate referred to, LWWW behavioral health and lifestyle coaching resources.
 - Supporting the funding of equipment and projects aimed at occupational injury reduction and increased wellness.
 - Facilitating and scheduling staff participation at OSH-Wellness education classes.
 - Providing specific LWWW resources including EAP consultation, health coaches, tobacco cessation, work-family life balance initiatives, stress management, and environmental changes such as access to more nutritional food options, and exercise opportunities and access to fitness and wellness centers.
 - Having D-H supervisory staff, directors, managers and supervisors attend the D-H Supervisor's Safety and Workability Responsibilities Course, focusing on supervisor responsibility of their safety responsibilities.
 - Communicating risks effectively to "at-risk" departmental supervisory staff to improve awareness and recognition of unsafe conditions and activities
 - Ensuring all levels of staff participation, buy-in, and accountability, and communicating that opting out by staff is not an option.

Evaluation and continual improvement

Each year, the goal is to reduce the number of "at-risk" departments without compromising incident reporting. D-H incident reporting has more than doubled since 2008. Evaluation and continual improvement strategies further help address this goal and include:

- Evaluation: Organizing an independent follow-up audit upon the "at-risk" department's request but not less than 12 months from the implementation of corrective action.
 - Evaluating activities by having the "at-risk" department director, in collaboration with the "at-risk" department's OSH-Wellness Committee, regularly review the effectiveness of corrective actions in reducing incidents.
- Continual improvement: Rating of the effectiveness of corrective action occurs, and is acted upon as necessary.

Evaluation for surveillance

On-going surveillance of worksite trends and the health of workers, or discovery of new knowledge, require more extensive and longitudinal evaluation expertise. Precise, reliable, and valid measures are time intensive and may be expensive, but have the potential to lead to new knowledge.[4] The types of data that might be collected over

time include: health outcomes; trends in injuries; OSHA claims; and effects of policies and programs on long-term worker productivity, absenteeism, and disability management.

Strategies for evaluation

Form an evaluation team

The National Institute for Occupational Safety and Health (NIOSH) recommends forming a team to plan the evaluation, and suggests including workers as key sources of information about a worksite.[2] Such a team could be one of the working groups described in “Chapter 1—Providing the foundation.” NIOSH further suggests that the team include those who will be affected by the program, those responsible for implementing it, and those responsible for making decisions about its future.[2]

Be clear about the intended audience for the program and the evaluation

Programs and communications should be tailored for the audiences. It is important to report on decisions about the program and results of the evaluation to the entire worksite community. This may mean different types of communications for different audiences. Managers may be more interested in returns on investment, while workers may be more interested in changes in benefits, health, and well-being.

For the SafeWell approach--evaluate all levels of worksite health programs, and all topics contributing to worker health and well-being

The SafeWell approach to worksite and worker health encourages multi-level programs to occur, so it is important to evaluate progress of all programs, e.g. physical environmental changes; organizational policies, programs, and practices; as well as individual risk reduction behavior. Similarly, progress related to worksite health promotion, occupational safety and health, and the psychosocial work environment and employee resources may be evaluated. Coordinated and comprehensive reviews across departments can assist with this, as can an integrated data management system (see below).

Consider integrated data management

An integrated data management system is one that coordinates data collection, management, and analysis throughout the organization. Such a system can be challenging to organize and implement, but as the IOM reports, one of its strengths is systematic data collection that allows for data integrity and consistency.[3] It also has the potential benefit of providing a comprehensive view of organizational issues and whether attempts to address them have been successful.

Although an organization may not yet have an integrated data management system, it is a step worth considering to understanding better how the various components of worker and worksite health and safety interact. Such a system can help to identify at-risk populations or units, low-risk populations, and assist in predictive modeling.[3] One step

toward achieving an integrated system is through data warehousing—a trend in data management that coordinates existing databases throughout the organization with common measures.[3] Some examples of data elements for such databases include: health behaviors and risk factors, medical and pharmacy expenses, productivity indicators, quality-of-life indicators, environmental policies and factors, and program participation.[3] Data and software need to be standardized and measures to protect data security and confidentiality need to be assured. The implementation of such a system requires management commitment and support. The goal of such a system, as described by the IOM, “is to drive collection of universal and reliable data that will satisfy common program goals and ensure that information obtained is meaningful to all participants.”[3]^{p.153}

An organizational framework for integrated data management is discussed by the IOM, and may be helpful for identifying specific data collection purposes and strategies. See page 154 at: <http://www.iom.edu/Reports/2005/Integrating-Employee-Health-A-Model-Program-for-NASA.aspx> (a free PDF download). This framework can provide the basis for an organizational scorecard that tracks progress of the specific measures deemed important and relevant to any organization.

Even if the organization is not quite ready to integrate its data, the principle of cross-departmental thinking about reviewing data and addressing problems can be applied. Data may be collected separately by department, and then discussed and addressed across function by representatives from multiple departments. For instance, if a hospital finds its injury rates are particularly high in some units, representatives from the Divisions of Occupational Safety and Health, Worksite Health Promotion, Facilities, and Human Resources may all be able to review the data and suggest creative ideas to address the problem comprehensively.

Consider including process and outcome measures

While the specific measures for evaluation are dependent upon organizational priorities, goals, and objectives, the IOM maintains that measures concerning program reach, participation, and satisfaction should also be included.[3] These are usually regarded as process measures, but can in and of themselves sometimes be outcome measures, as well. Here are some basic factors to consider measuring:

- Reach: Extent to which the intended audience was reached
- Fidelity: Extent to which the program/policy was implemented according to plan
- Participation levels in policy and program efforts
- Desired outcomes: Extent to which program achieved desired outcomes
- Return on investment or cost-effectiveness

Process measures are important for understanding if the program was implemented correctly and outcome measures are important for measuring program effectiveness. Some outcome measures that might be of interest to employers and employees are health outcomes, health care costs, worker productivity, and organizational change. Health

assessments, employee health and interest surveys, and JourneyWell's Dimensions of Corporate Wellness scorecard (see Chapter 2 for discussion of these) are tools to help assess some of these measures.

Further descriptions of process and outcome measures are available at the Centers for Disease Control and Prevention's website on Workplace Health Promotion Evaluation, available at: <http://www.cdc.gov/workplacehealthpromotion/evaluation/index.html>.

Consider predicting costs and benefits and/or return on investment (ROI)

Data comparing the costs of the program to current and projected health care costs might be helpful for decision-making about whether to continue a program. An offshoot of this is a frequently discussed measure called Return on Investment (ROI). Basically, ROI is the amount of dollars earned or saved for every dollar invested.[5] As most managers will want to know the value received for resources allocated, an ROI is one measure to consider. A useful publication on ROI from the Wellness Council of America (WELCOA) is available at:

<http://www.welcoa.org/freeresources/pdf/0110newsviewsgoetzel.pdf> In order to predict an accurate ROI for the SafeWell integrated program, safety and health costs would also need to be included. An integrated ROI does not currently exist.

Choose milestones that are short-term as well as long-term

It is important to include both short- and long-term outcomes in the evaluation. Maintaining and improving worksite and worker safety and health can be a complex effort that may take a few years to reap rewards. However, management may want to see concrete positive outcomes within a year, or it may pull its support. Hopefully, top managers who have embarked upon using comprehensive worksite health programs understand it is a long-term commitment. Nevertheless, it is wise to include some milestones tied to short-term objectives that are achievable and can produce short-term success. Short-term successes can support further employee and management engagement. Some examples of short and intermediate-term milestones could include:

- The process of establishing workplace health programs, policies, benefits, or environmental supports
- Employee awareness of and satisfaction with programs and services and those that provide them
- Participation in and use of programs and services
- Changes in employee health behaviors and risk profiles
- Formation of a SafeWell integrated working group consisting of different levels of employees and reports of their activities
- Implementation of a plan to reduce back pain that incorporates organizational as well as individual approaches

Incorporate an evaluation component into each phase of the SafeWell cycle

Although this chapter comes after those on decision-making, program planning, and implementation, it does not mean that planners need to wait until the end of the program to conduct evaluation. It is more useful to think about how to evaluate programs and the SIMS in the beginning of adopting the SafeWell approach, as well as along the way. That will provide opportunities to celebrate successes and make mid-course improvements if necessary.

Make evaluation part of program delivery

In the spirit of conducting on-going evaluation to support continuous improvement, evaluation may be linked to program delivery. For instance, process measures, such as how many employees participated in a Health Risk Appraisal (HRA), are often linked to the delivery of that activity. When an employee completes an on-line HRA, that completion can be tracked. If a 65% HRA completion rate is desired, progress toward that goal may be noted by tracking the process measure of HRA completion.

Conduct evaluations that are efficient, financially viable, and meaningful[3]

It is important that information collected in the evaluation is used. A meaningful evaluation will be aided by careful planning, with an eye toward having consensus from all program stakeholders as to the purpose and expectations from the evaluation. An efficient evaluation will then focus on evaluating those items that are most pertinent to the organization, and that are reflected in its goals and objectives. Using an integrated approach to data collection and management may also increase the efficiency of the evaluation, as was discussed above.

Also important to know is what the evaluation resources are. These should be included when considering the overall cost of the program. For instance, is there in-house expertise for the type of evaluation desired? What will the health appraisal cost, in terms of time and effort? Are resources needed for extra communications efforts and incentives for survey participation? Some may want to consider having an outside consultant or vendor evaluate the program. See “Chapter 2: Program planning” for information on outside vendors.

Incorporate the following recommended strategies during the evaluation process

There are a few strategies that are important to consider when reviewing and addressing evaluation results.[6]:

- Through the measurement and monitoring process, if safety and health incidents are discovered, they should be investigated.
- Audit the evaluation process periodically to ensure that procedures and information collected are standardized and appropriate.
- Ensure the employees and management participate in the process. One way to is to solicit suggestions for corrective and preventive actions and feedback on the planning process.

- Communicate results to all levels of management and employees.
- Celebrate successes and the responsible individuals and groups.

Existing program evaluation resources

Unfortunately, there does not seem to be one evaluation that is all-inclusive of the SafeWell approach to worksite and worker health. The closest is probably the Corporate Health Achievement Award (see below). However, some of the following may be adaptable.

Penetration, Implementation, Participation, and Effectiveness (PIPE) Impact Metric

The PIPE impact metric provides a score to measure the impact of a worksite health promotion program. The following example comes from Pronk's work that has been referenced in the IOM book (page 135).[3]

Table 3—PIPE Impact Metric

Variable	Definition	Rate Calculation	Coefficient
Penetration	Proportion of target population reached	10,000 of 10,000 employees reached = $10,000/10,000$	1.0 (100%)
Implementation	Degree to which program was implemented according to plan	After review, staff concludes 80% of workplan was implemented	0.8 (80%)
Participation	Proportion of invited employees who enroll in program	2,000 employees enrolled = $2,000/10,000$	0.2 (20%)
Effectiveness	Rate of successful participants. Criterion is set prior to program implementation and is related to goals and objectives	1,500 participants successful-- $1,500/2,000$	0.75 (75%)
PIPE impact metric	Overall program impact score	$1.0 \times 0.8 \times 0.2 \times 0.75$	0.12 (12%) improvement

The PIPE impact metric has been scored and reported using program implementation data, but no normative benchmarking data are currently available. [3] Nevertheless it is a relatively simple metric to measure and calculate and may be helpful as an evaluation tool. Although it has been used for health promotion programs targeting individuals, it might be adapted to include safety and health, as well as other organizational/environmental level programming and practices.

Corporate Health Achievement Award (CHAA)

Although not strictly a program evaluation tool, sometimes tools that have been developed for different organizational awards processes may serve a similar purpose. The CHAA has been developed by the American College of Occupational and Environmental Medicine to “recognize organizations with exemplary health, safety, and environmental programs,” available at <http://sa.chaa.org/>. Organizations conduct a comprehensive review of the following areas: leadership and management, healthy workers, healthy environment, and healthy organization. There is a free on-line self assessment that organizations may utilize to evaluate themselves against CHAA standards as well as to benchmark themselves against award recipients and other organizations like themselves.

NIOSH’s Guide to evaluating the effectiveness of strategies for preventing work injuries: How to show whether a safety intervention really works

While this document is about evaluating safety interventions, it is also an in-depth primer on evaluation. It includes information on effectiveness evaluation, planning, evaluation designs, sampling techniques, measurement, qualitative methods, and statistical methods. Though focusing on injury, its recommendations apply to any evaluation of a worksite program. It is an important document to consider if the purpose of an organization’s evaluation is for research such as surveillance, and knowledge discovery. The document is available at: <http://www.cdc.gov/niosh/docs/2001-119/>

NIOSH’s How to Evaluate Safety and Health Changes in the Workplace: Does it Work?

While the NIOSH guide mentioned above is quite comprehensive in its description of evaluation, NIOSH used it to serve as the inspiration for a much shorter and simpler guide about evaluation that includes recommendations for evaluation, descriptions of actual worksite evaluations, and a couple of tools that worksites might use. It is available at: <http://www.cdc.gov/niosh/docs/2004-135/>

OSHA’s safety and health assessment tool

To evaluate how an organization’s occupational safety and health management system rates, OSHA has developed a useful e-tool focusing on 1) management leadership and employee involvement, 2) worksite analysis, 3) hazard prevention and control, and 4) safety and health training. The resulting scores provide information on areas for improvement. The tool is available at: http://www.osha.gov/SLTC/etools/safetyhealth/asmnt_worksheet.html). While

providing a helpful evaluation tool for safety and health, it does not address worksite health promotion. It might be possible, however, to adapt to include the areas of human resources benefits as well as worksite health promotion.

The Health Enhancement Research Organization (HERO) Employee Health Management (EHM) Best Practice Scorecard

HERO provides a free on-line scorecard both to teach respondents about EHM best practices, and to evaluate opportunities to improve their organization's programs and evaluation efforts. Responses are benchmarked against a national database of other organizational respondents. It is available at: http://www.the-hero.org/scorecard_folder/scorecard.htm

Other program evaluation resources

Here is a listing of some program evaluation resources available for health promotion and occupational safety and health.

- CDC Framework for Program Evaluation in Public Health
<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr4811a1.htm>
- Evaluation Context within the ILO International Guidelines on Occupational Safety and Health Management Systems
http://www.ilo.org/public/libdoc/ilo/2001/101B09_287_engl.pdf

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