



Medical Advisory Service

Occupational and Environmental Medicine, Public Health, and Toxicology Consultants

How Can We Use Key Performance Indicators in Occupational Health?

Guidotti's Guides © Tee L. Guidotti, 2009

Key performance indicators (KPIs) are benchmarks used in the private sector to determine whether their activities are meeting business objectives. They are derived from data collected within the organization and benchmarked against historical trends, best practices in the industry, or standards that reflect goals. KPIs represent a set of measures that can be used in combination to determine whether the project, product line, or organization is on track to meeting goals or if and where further effort is required to drive the enterprise in the right direction. For that reason, a collection of KPIs that are tracked closely by senior management is called a “dashboard”.

The occupational health or HSE manager and others can apply the concept professionally in several ways, among them:

- As a manager, to assess the performance of an academic teaching faculty (relatively easy, with the principal problem being interpreting student evaluations) or research unit (very hard, because innovation and quality are hard to measure).
- As a scientist managing large-scale research or demonstration projects, to manage the study and guide its successful completion.
- As an investigator, to develop relevant research to derive measurable performance indicators, which need to be developed, validated, and their own performance tracked.
- As a teacher, to construct more sophisticated evaluations of course materials and instruction based on continuous improvement rather than adequacy.
- As a practitioner, to apply in consulting or service activities involving enterprises that use them.
- As a program or project administrator, to evaluate progress and impact.

KPIs should flow naturally from the business model (or, in the case of a research grant, the work plan) and reflect important goals. An organization has a mission of what it is supposed to achieve (and so do research projects), a vision of how it should operate, and goals, short- and long-term.

KPIs operationalize the goals by providing numerical targets. KPIs should be SMART: Specific, Measurable, Achievable, Realistic, and Time-bound. (The origin of this formulation is unknown but the concept has been around since at least 1954, according to the entry in Wikipedia.) KPIs can be categorized in many ways:

- Quantitative indicators, which can be presented as a number and might include indicators of activity (such as number of subjects enrolled in a study or number of patients seen in clinic).
- Practical or operational indicators reflect operations or process efficiency (“cycle time” for completion of a case, waiting times, or percentage of patients who have gone through an intervention or educational program).
- Directional indicators are trends that suggest improvement or warn of decline.
- Actionable indicators are like “idiot lights” on a dashboard – they warn that immediate action should be taken to avert a serious problem (such as failure to have 100% of project staff trained in patient confidentiality or human subjects protection in a multicenter research study).
- Financial indicators are used in business performance but are usually not very helpful in tracking progress in occupational or environmental health operationally; they do not provide enough information on quality or benefit.



The Table gives examples of KPIs as they might be applied to occupational health in an enterprise. KPIs can be leading or lagging. Leading indicators precede the outcome and usually reflect the process or resources available. Lagging indicators reflect the outcome and its consequences.

Leading indicators occur in advance of the outcome and are informative about the direction that things are going, preferably in sufficient time to make corrections. A leading indicator might be performance on a midterm examination or the cumulative number of subjects enrolled in a trial, measured monthly or at the midpoint. Ideally, a leading indicator gives the responsible instructor or investigator enough time to change things before the final outcome is determined.

Lagging, or “trailing” health indicators describe outcome and in our field are mostly related to the frequency of injury and disease. By then, of course, it is too late and the outcome may reflect a lapse or problem that occurred in the past. Because adverse outcomes in occupational health tend to be uncommon, they are statistically unstable and may be difficult to interpret properly. Even so, they are important because they report the true experience of events that are happening in the environment or workplace.

The management philosophy behind KPIs is quite different than that of evaluation research, which usually takes a backward-looking view to assess the value of what has already been done. Evaluation research treats leading KPIs as process measures and therefore inferior to outcome measures, which ultimately tell the story that matters. Process measures are most valuable as ways of determining what went wrong if the outcome was bad or if sufficient resources or effort were expended on the goal. Management theory treats leading indicators as the more valuable, however, because the manager is examining them going forward and needs the information to navigate and make mid-course corrections.

KPIs for environmental and occupational health require more information than classroom evaluations, grant progress reports, business or financial indicators. Special information systems are required to develop the indicators required for tracking occupational health protection and health management. Reliance on KPIs requires a commitment to the collection of data to support them. The burden should be kept to a minimum, however, because an elaborate and expensive system will not be sustainable.

This is the downside to KPIs. They can be easily misused if they are not periodically reviewed and updated. However, updating a KPI (for example, by changing the definition of a reportable injury) loses historical continuity (for example, in injury rates) and distorts trends. There is also a tendency to base KPIs on the data that are available rather than the guidance that is needed and this should be resisted.

Although it is unlikely that a small number of KPIs will provide an adequate description of comprehensive occupational health performance, the actual number used in practice should be kept to a reasonable limit. Over time, KPIs used for operational purposes, should be evaluated, prioritized, and assessed for cost-effectiveness in data collection. The list of indicators tracked should be narrowed to those KPIs that provide the most useful information and that do not duplicate each other or closely track together (and therefore can be assumed to measure the same thing).



Table: Examples of Key Performance Indicators in Occupational Health

<u>Leading Indicators</u>	
1.	Number of completed risk assessments for workplace hazard evaluation. (Measures activity, not quality.)
2.	Percentage of “health risk assessments” completed, by business unit. (Measures completion, not just activity.)
3.	Percentage of completed “health risk assessments” resulting in a recommendation that was implemented. (Measures follow-through directly and quality indirectly.)
4.	Percentage of workers at-risk that have completed appropriate worker education and training programs appropriate to their positions.
5.	Percentage <i>exceeding</i> a standard response time for medical emergencies, with documentation as to why. (Note that <i>average</i> response times are of virtually no interest or usefulness – it is a measure that carries essential no useful information. What matters is how many responses were inadequate as judged by a standard that reflects medical urgency.)
6.	Compliance with clinical care guidelines for work-related injuries. (Assuming that the guidelines are authoritative, such as the American College of Occupational and Environmental Medicine Practice Guidelines, this is a measure of quality of care.)
7.	Number of fitness for duty evaluations performed. (Just a measure of activity but has to be known to go further.)
8.	Percentage of fitness for duty evaluations with recommendations appended. (This is getting to a measure of quality.)
9.	The percentage of workers who completing periodic health surveillance evaluations appropriate to their position, over cycle length
10.	Number and description of health impact assessments completed for new projects
11.	Time between diagnosis and reporting of work-related illness
12.	Percent completeness of reporting occupational injury, comparing lowest and highest reporting levels
<u>Lagging, or Trailing Indicators</u>	
13.	Sentinel event cases detected (indicative of a deeper problem)
14.	Frequency of occupational illness (very hard to measure because of latency, underreporting, and appearance of many conditions after retirement)
15.	Years since last fatality.