

INTRODUCTION

All organizations use some form of measures or indicators to drive and monitor their performance. This is true for the system or process used to manage musculoskeletal disorder (MSD) injuries and improve workplace ergonomics. Humantech strongly encourages the use of leading measures to drive these improvements. In our 2011 benchmarking study, we identified that all participating companies tracked the number or rate of MSD injuries, a lagging measure. However, the best performing companies in the study all relied on the level of MSD risk, a leading measure, as their primary indicator. This statement provides background on Humantech's position to use leading measures to drive proactive improvement.

Humantech recommends that organizations focus on using leading measures of MSD risk factors to drive their ergonomic improvement process. This is in contrast to the more common and traditional practice of using recordable injuries and illnesses as a measure of an ergonomics program. Leading, risk-based measures can be categorized into two groups: systems-based and operations-based measures. We recommend the following measures for each group.

Table 1: For systems-based measures:

Key Performance Indicators (KPI)	Type	Tracking Method	Frequency	Target
% of workstations/jobs at high risk	Leading results	Ergonomics process software	Monthly	100%
% reduction of MSD risk	Leading results	Ergonomics process software	Monthly	20%

Table 2: For operations-based measures:

Implementation Measures	Type	Tracking Method	Frequency	Target
% of targeted workstations/jobs assessed for risk	Leading activity	Ergonomics process software site improvement plans	Monthly	100%
% of new workstations/tools/equipment at low/no risk upon purchase or installation	Leading activity	Ergonomics process software	Monthly	100%
% new workstations/jobs that are high risk upon installation	Leading activity	Ergonomics process software learning management system	Quarterly	100%
Incidence and severity rates for work-related MSDs	Lagging results	Injury records and logs (e.g. OSHA 300 logs; Workers' Compensation records)	Quarterly	0

LEADING VERSUS LAGGING METRICS

Both leading and lagging measures are used today throughout businesses, and in managing occupational safety, and there are multiple descriptions of each. It is generally understood that lagging measures are recorded after an event has happened. Examples of these events in safety management programs include injuries and illnesses, discomfort, equipment failure, spills, and fires.

Tracking the number or rate of MSD injuries is an example of a lagging measure. Within the U.S., tracking and reporting recordable injuries and illnesses is a common and traditional measure practiced by most employers. This is because reporting these incidents is an OSHA requirement with the data summarized and reported by the Bureau of Labor Statistics. OSHA's original intent (1986) for reporting this lagging measure was to enable "accurate interindustry comparisons, trend analysis over time, and comparison among firms, regardless of size." In other words, the purpose was to compare industry to industry and to compare the performance of one organization to the industry average. Unfortunately, this measure is being used for reasons other than its original intent and design. Many organizations use it to measure the effectiveness of a safety and/or ergonomics program, safety performance of managers and supervisors, and as a basis for employee recognition programs and bonuses. Using the incidence of MSDs, a subset of all injuries, is a non-specific measure of the ergonomic quality of the workplace and does not allow timely and proactive action to prevent MSDs.

Recently, The Campbell Institute provided a clear definition of leading measures as "*proactive, preventative, and predictive measures that monitor and provide current information about the effective performance, activities, and processes of an EHS management system that drives the identification and elimination or control of risk in the workplace that can cause incidents and injuries.*" In short, leading measures are indicators of problems or exposures that allow enough time to take corrective action before an injury or loss occurs. In our experience, organizations that use leading measures to drive their risk reduction and hazard prevention activities are most effective and successful.

Stough (2012) identified the key features of leading measures to include the following:

- Simply and closely connected to the outcomes
- Objectively and reliably measurable
- Interpreted by different people in the same way
- Broadly applicable across company operations
- Easily and accurately communicated

It is our experience that the recommended measures meet all of these criteria.

QUANTIFICATION OF MSD RISK

A core element of any safety or environmental management system is the focus on systematically managing “aspects and impacts” and “hazards.” Within an ergonomic improvement process or ergonomics management system, this focus should be on managing those conditions that cause losses. Because the purpose of most ergonomic improvement processes is to reduce MSDs, the focus is on MSD risk factors. The three primary risk factors that cause MSDs are:

- Awkward posture
- High force
- Long duration or high frequency



Figure 1: Primary MSD Risk Factors

Increasing the combination or amount of these risk factors increases the chance of developing discomfort, pain, and/or an MSD. The secondary risk factors that contribute to developing an MSD include:

- Soft tissue compression
- Low temperatures
- Vibration
- Impact stress
- Glove issues

Fortunately, through research, the threshold of exposure to each of these risk factors has been quantified for each joint of the body. This understanding of thresholds, compiled by NIOSH and other organizations, provides a way to measure exposure to MSD risk factors, determine where exposures exceed an acceptable threshold, and enables one to take proactive steps to reduce exposure before an MSD injury occurs. This follows the same industrial hygiene or hazard analysis process used to control hearing loss, pinch points, chemical exposure, and other occupational exposures.

In addition to allowing quick identification of MSD risks, quantification of exposure allows immediate measurement of the change in exposure following a change in the workstation (an engineering or administrative control). In addition to having the advantage of being an early warning system, this metric can provide immediate feedback about the effectiveness of controls. So measuring the level of MSD risk enables tracking and reporting of the two systems-based measures listed in Table 1.

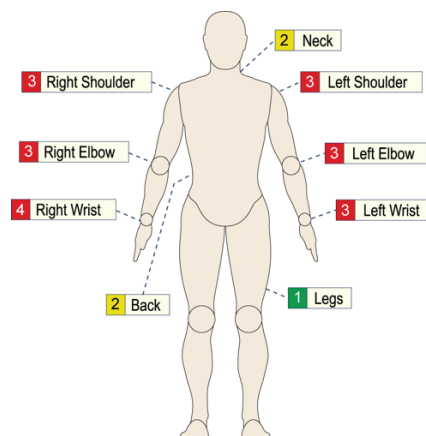


Figure 2: Example of results of whole-body MSD risk assessment

ACTIVITY AND RESULTS MEASURES

Measures can also be categorized by what they are measuring, activities or results. The measures recommended in Tables 1 and 2 include both. The recommended measures of activity are operations-based measures that are typically used when first starting an ergonomic improvement process to provide momentum and drive until the process is well established and maintained. They assist a site, and the team of people supporting the site program, in monitoring its progress toward plans and goals. Activities include ergonomics training, engineers applying design criteria in new and modified equipment, and ergonomics team members conducting risk assessments. The results of these risk reduction activities feed into the measurement of risk level and risk reduction.

Measures of results are those indicating progress or changes in conditions. For ergonomics processes, these are the measures of reduction of exposure MSD risk at an individual workstation, at all workstations within a department, across a single plant, or across a business unit or enterprise. They are both a measure of how well the activities are performed (by engineers, managers, leaders, and ergonomics teams) and the results of those activities. Systems-based measures are best when limited to just results metrics.

OPERATIONS-BASED AND SYSTEMS-BASED MEASURES

Operations-based measures are those indicators of the functioning of an organization's (e.g., site) ergonomic improvement process. We recommend tracking them regularly for at least the first two years after launching a site process. These activity measures drive and routinize the actions of people supporting the process.

Systems-based measures are those higher-level, key performance indicators that should be tracked and monitored by business leaders—both the leaders at a site (e.g., plant manager) and enterprise-wide leaders (corporate or company-wide). These results measures are indicators of how well the ergonomic improvement process, or management system, is being managed. The two recommended measures are preferred over using MSD incidence rate as a KPI, and they provide a metric for ensuring management accountability (e.g., a basis for calculating performance bonuses).

OPPOSING POSITIONS

We've heard from several safety and loss prevention professionals that their preference is to continue to use the recordable injury/illness rate as the sole or primary measure for their ergonomics programs. Their reasons were that "management is finally tracking recordable injuries," their current system for managing safety and ergonomics is based on this measure, and the information is readily and easily available. Typically, this data is tracked and reported by insurance and Workers' Compensation providers.

We concur that measuring recordable injuries and illnesses is common and available in the U.S. However, it is not regularly practiced or possible in many other countries, does not provide an early warning system to prevent MSDs, is not specific to the causes of MSDs, and it can require months to indicate change.

CONCLUSION

Measures based on MSD risk factors are proven, by benchmarked leading companies, to be an effective and efficient way to drive ergonomic improvements. The resources required, and ease of collecting exposure data on individual workstations, have been simplified with integrated ergonomics software programs that automatically administer the data, collate it, and allow reporting at different levels of a site or enterprise. The few, selected measures we recommend have been shown to expedite and drive organizations to establish and sustain an ergonomic improvement process that best fits their needs, resources, culture, and business management system.

ENDORSEMENT

This position statement was accepted by Humantech's Senior Leadership on month, date, 2016.

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