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Public report



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Executive Summary

In 2010, WorkSafeNB asked the Institute for Work and Health (IWH) to assess its Internal Responsibility System Questionnaire (IRSQ), a survey tool it had developed to measure safety culture within an organization. As part of its assessment, IWH compared the IRSQ with another previously validated tool designed to measure leading indicators, called the Organizational Performance Metric (OPM).

In light of its findings, IWH recommends that WorkSafeNB consider using the OPM metric. This is the case for the following reasons:

- The OPM is shorter and easier to complete.
- The OPM's results are related to historical workers' compensation claims rates, while the IRSQ's results were not shown to be. That is, the better a firm's OPM score, the lower its total, lost-time and no-lost-time claim rates in previous years.
- Agreement between manager and employee respondents on a firm's score is higher for the OPM than for the IRSQ.

Background

WorkSafeNB is a Crown corporation that administers occupational health and safety and workers' compensation in the province of New Brunswick, Canada. In 2001, WorkSafeNB began using a health and safety infrastructure measurement tool to assess the safety behaviours, processes and knowledge of an organization. The intent was to use the measurement tool as a benchmark of an organization's occupational health and safety (OHS) performance and to assist in developing a health and safety plan.

Benchmarking tools such as these are part of a growing interest in the use of *leading indicators* to assess OHS performance. Traditionally, an organization's injury and illness rates are used to measure health and safety performance. These are known as trailing or lagging indicators because they represent injuries that have already occurred. Leading indicators, on the other hand, measure organizational characteristics and practices to provide a sense of an organization's health and safety performance—and point to potential areas for improvement—before workplace injuries and illnesses occur.

While useful, WorkSafeNB's original tool was long, covering five core domains and 22 topics. As well, it had to be administered to all employers, supervisors and managers in an organization. This represented a significant time commitment on behalf of WorkSafeNB and the organizations involved.

In an effort to be more efficient and improve the ability of WorkSafeNB to assess and support organizations, WorkSafeNB developed a new leading indicator tool—the 18-item Internal Responsibility System Questionnaire—to assess key elements of safety culture (see page 10).

The Institute for Work & Health is a not-for-profit research organization based in Toronto, Canada. The Institute was asked to collaborate with WorkSafeNB to assess the utility of its 18-item IRSQ in New Brunswick.

As part of the assessment and validation process, IWH compared the IRSQ with another previously validated leading indicator tool to measure health and safety performance—the eight-item Organizational Performance Metric (see page 11). The OPM was developed by Ontario's prevention system under the Institute's research lead. For more on the pilot of the OPM, see www.iwh.on.ca/system/files/documents/benchmarking_organizational_leading_indicators_2011.pdf.

Data collection: The method used

In the fall of 2011 and spring of 2012, WorkSafeNB asked organizations within the province to complete a survey that included both the IRSQ and OPM tools.

WorkSafeNB mailed the surveys to employer operations, marked to the attention of the general manager. The sender of the letter was WorkSafeNB's Program Development and Evaluation Department.

The general manager was asked to have the survey completed by two people within the organization knowledgeable about occupational health and safety: a manager (senior manager or supervisor) and an employee representative. The survey was then to be returned to WorkSafeNB's Program Development and Evaluation Department in a self-addressed envelope.

The recipient of the letter was assured that individual survey results would be kept confidential, with only a summary of the analysis being shared. The recipient was also assured that, due to the generality of the questions, results could not be used for *Occupational Health and Safety Act* compliance purposes.

This method of administering the surveys in New Brunswick differed from the method used in Ontario during the pilot of the OPM. WorkSafeNB effectively administered the survey and did not use an independent research organization, as was done in Ontario. The pilot OPM study involved eight Ontario health and safety associations (HSAs). HSA representatives either telephoned respondents, interviewed them in person or had them attend a meeting to fill out the short pilot questionnaire. The method of distribution was decided by the HSA representatives, and not randomly assigned.

Data collection: Description of respondents

WorkSafeNB staff set out to collect data from 795 firms, and successfully did so from 330 of them. This represented a 42 per cent response rate.

Overall, information from two respondents was collected in 244 firms, from a single respondent in 81 firms, from three respondents in three firms, and from four respondents in two firms. A total of 586 surveys were completed. Respondents were classified as senior managers (n=206), supervisors (n=101), employees (n=206) or 'others' (n=73).

Based on the first two digits of their North American Industry Classification System (NAICS) code, the businesses participating were from the following industries: agriculture (n=16), construction (n=43), manufacturing (n=81), transportation (n=42), professional service (n=15), health care (n=60), accommodation (n=29) and public administration (n=43). These businesses were classified as small (n=129), medium (n=128) or large (n=72).

Participating firms were also classified according to their occupational health and safety performance. WorkSafeNB classifies a firm as having above-average, average or below-average performance based on its lost-time claim rate within its industry. Of all firms, 24 per cent were classified as above average, 52 per cent as average and 24 per cent as below average in terms of their occupational health and safety performance.

Of the 586 surveys returned, the IRSQ items were successfully completed in 557 of them and the OPM items in 574 of them. Successfully completing the IRSQ was defined as leaving no more than two items unanswered. Among the 557 surveys successfully completed with respect to the IRSQ items, 501 had all items answered, 36 had all but one item answered, and 20 had all but two items answered.

Successfully completing the OPM metric meant no more than one item was left unanswered. Among the 574 surveys successfully completed with respect to the OPM items, 552 had all items answered and 22 had all but one item answered.

A simple method was used to assign a value to unanswered items on both the IRSQ and OPM tools. They were assigned a value equal to the mean of the remaining completed items.

Data analysis

WorkSafeNB staff provided IWH researchers with the survey responses, as well as the historical injury and illness workers' compensation claims data for each organization that completed a survey. All data was de-identified to protect the privacy and confidentiality of participating organizations.

IWH was then asked to link and use the survey and claims data to answer four questions:

1. Are the 18 items in the IRSQ and the eight items in the OPM measuring a single leading indicator (i.e. a single dimension of OHS performance), as expected, or are they measuring multiple dimensions (e.g. safety culture and safety training)?
2. Are all items needed to measure each leading indicator, or is a smaller number equally useful?
3. Are the IRSQ and OPM related? Are the two tools measuring the same or different leading indicators?
4. Are both the IRSQ and OPM related in expected ways to a business's historical workers' compensation claims; that is, did those who performed better on the IRSQ and OPM have lower claims rates in the past?

In answering the questions, IWH faced two challenges:

1. Some employers had multiple operational units and/or locations. These were treated as separate firms where independent injury and illness data was available.
2. The original OPM was accidentally modified by replacing its original Item 4— "Workers and supervisors have the information they need to work safely"—with Item 4 of the IRSQ—"The organization regularly reviews health and safety results for on-going safety improvements." The OPM analyzed in this study, therefore, is based on this modified metric (i.e. that incorporates the changed Item 4). However, IWH strongly recommends using the OPM in its original form, as is shown on page 11.

Findings

1. Both the IRSQ and OPM measure single leading indicators.

The IRSQ is measuring one dimension of OHS within a firm: its internal responsibility system. A firm's internal responsibility system is a core leading indicator of its commitment to the practice of workplace health and safety because it indicates the degree to which everyone in the workplace is responsible for, and understands his or her role in, health and safety within the organization.

The OPM is also measuring one dimension of a firm's OHS: its organizational health and safety performance. This is a leading indicator because it indicates the degree to which occupational health and safety programs, policies and practices are in place and operational.

The finding that these tools are measuring one leading indicator is a positive one because the developers of the tools intended them to measure only one core dimension of health and safety. If other dimensions were being measured, it would muddy the waters, so to speak.

2. In both the IRSQ and OPM, all items are relevant to the leading indicator and should be kept in the tool.

By correlating item responses with each other and with the total score for each tool, it is possible to tell if each item is necessary or if some items are redundant. If items are highly correlated with each other, they are considered to be measuring the same thing and not different components of internal responsibility (in the IRSQ) or organizational performance (in the OPM). If this is the case, then one item might be chosen over the other to be included in the tool to make it easier and quicker to complete. If any one item is highly correlated to the total score, this may indicate it is the only item necessary to measure the leading indicator.

The analysis of both the tools shows that the IRSQ's 18 items were moderately related to each other, as were the OPM's eight items. This suggests the items are measuring different parts of a firm's internal responsibility system and organizational performance, respectively. Each of the IRSQ's 18 items and the OPM's eight items also correlates well to the tool's total score, but none so highly that it is the only item that matters within the tool. This indicates that all of the items in each tool should be kept.

3. The IRSQ and OPM are not measuring the same dimensions of health and safety performance.

If the correlation between IRSQ and OPM scores is high, then the two tools are measuring the same leading indicator. The study found that the correlation between the two instruments was moderate, indicating that they are not measuring exactly the same aspect of a firm's health and safety system. (Item 4 in the OPM, which was the same as Item 4 in the IRSQ, was removed from the OPM from this analysis so that the correlation between the two tools would not be artificially inflated.)

4. The IRSQ is not associated with a firm's historical workers' compensation claims rates.

How well does the IRSQ relate to a firm's historical workers' compensation claims rates? The short answer is "not very well." When the relationship between a firm's IRSQ scores and five-year historical claims rates was examined, no statistically significant relationship was found between the firm's IRSQ score and its total or lost-time claims rates. There was one statistically significant result: the better a firm's IRSQ score, the lower its no-lost-time claims rate.

5. The OPM is associated with a firm's historical claims rates.

How well does the OPM relate to a firm's historical workers' compensation claims rates? In this case, the short answer is "very well." When the relationship between OPM scores and five-year historical claims rates was examined, a statistically significant relationship between the OPM score of a firm and its total, lost-time and no-lost-time claims rates was found. Overall, the better the OPM score, the lower the claims rates. These results are supported by similar results in the Ontario pilot of the OPM.

6. Agreement about a firm's score was higher for the OPM than the IRSQ.

When two or more people from one firm filled out the survey, which was the case for the IRSQ in 236 firms and for the OPM in 244 firms, their agreement with respect to their firm's IRSQ or OPM scores was not high, although there was slightly more agreement about their OPM scores.

The disagreements were explored according to the position of the respondent: i.e. management (senior manager or supervisor) and employee. For 54 per cent of the IRSQ surveys and 60 per cent of the OPM surveys, the senior manager/supervisor and employee agreed on the scores. In 23 per cent of the IRSQ surveys and 16 per cent of the OPM surveys, the management respondent scored the firm lower than the employee respondent. In 23 per cent of both the IRSQ and OPM surveys, the management respondent scored the firm higher than the employee respondent.

In both tools, the smaller the firm, the more likely the responders were to agree. In the OPM only, responders were more likely to agree in firms with health and safety performances rated by WorkSafeNB as above average.

7. The method of delivering the tools does not seem to affect the efficacy of the surveys.

The OPM had a slightly higher response rate than the IRSQ in this survey, likely due to it being shorter. All in all, the method of delivery of the survey does not seem to depend too much on its distribution method. The IRSQ/OPM survey was administered in New Brunswick entirely by WorkSafeNB, while the OPM pilot survey was administered in Ontario through health and safety associations, using different methods (phone, in-person, meetings).

Recommendations

Based on the results, we recommend that WorkSafeNB consider using the original eight-item OPM metric, for the following reasons:

- It is short and easy to complete.
- The results are related to historical workers' compensation claims rates. This suggests that a firm that moves from a weak to a strong score on the OPM would reduce its total claims by over 30 per cent.
- Within-firm agreement is higher for the OPM. In 60 per cent of firms, the senior manager or supervisor was in agreement with the employee on the OPM scores.
- The New Brunswick results reproduce results from Ontario.

However, WorkSafeNB could consider some additional work. First, 58 per cent of the firms who were chosen to participate did not participate. This is a high non-response rate, and it could be biasing the results.

In particular, the lack of a relationship between IRSQ scores and claims rates could be the result of the better-performing firms selecting to participate. However, given that we found a relationship between OPM scores and claims rates, we don't consider non-response to be a strong threat to the validity of the conclusions.

Still, we suggest that the non-responding firms be compared to the responding firms on variables such as occupational health and safety performance status, firm size and industry type to better characterize the sample.

Obtaining one key informant's assessment of a firm's organizational performance may not be advisable. While we did find that in 60 per cent of firms employees were in agreement with their manager or supervisor who also filled out the questionnaire, at this time WorkSafeNB should consider obtaining multiple assessments at different organizational levels until further research is completed.

The good news is this: Unlike the assessment of organizational safety climate, in which a large number of employees, supervisors and managers must be surveyed to obtain a valid estimate, the OPM seems to require a smaller number, perhaps three.

Importantly, we are unsure whether one survey respondent in a firm is sufficient and, if not, what the appropriate number of respondents should be, and what their roles and responsibilities should be. We are conducting further research to answer this question. Therefore, we cannot make strong recommendation here until further research is completed.

Survey completed by:

- Employee representative
- Supervisor representative
- Senior management representative

Employer name:

Employer # :

Operation description:

Internal Responsibility System Questionnaire

Please indicate how much you agree or disagree with the following statements based on your organization's practices. If your organization has many operations, please base your answer on the operation indicated in the upper right hand corner. If you do not know the answer to a question, please leave the question blank.

CA=Completely Agree SA=Somewhat Agree SD=Somewhat Disagree CD= Completely Disagree

	CA	SA	SD	CD
1. This organization considers safety as important as quantity of work (production/service).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. The following individuals take action to solve safety problems:				
a. Employees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Supervisors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Senior Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. The following individuals are held responsible for solving safety problems:				
a. Employees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Supervisors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Senior Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. This organization regularly reviews health & safety results for ongoing safety improvement.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Safe work behaviours are recognized.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Employees contribute to decisions affecting their health & safety.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. To do their work safely, every employee in the organization has:				
a. Job-specific training.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. The necessary tools and equipment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. All incidents/accidents (including near misses) are reported to the supervisor/managers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. On an ongoing basis, this organization:				
a. Identifies hazards.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Assesses their risks.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Implements corrective actions/control measures.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Each individual in this organization knows that they are responsible for:				
a. Their own health & safety.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. The health & safety of those around them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Survey completed by:

- Employee representative
- Supervisor representative
- Senior management representative

Employer name:

Employer # :

Operation description:

Survey of Organizational Health and Safety Leading Indicators

Please answer the following questions based on your organization's practices. If your organization has many operations, please base your answer on the operation indicated in the upper right hand corner. If you do not know the answer to a question, please leave the question blank.

Please answer the question in regards to the percent of time that each practice takes place.

Health and Safety Practices	80%- 100%	60%- 80%	40%- 60%	20%- 40%	0%- 20%
1. Formal safety audits at regular intervals are a normal part of our business.	○	○	○	○	○
2. Everyone at this organization values ongoing safety improvements in this organization.	○	○	○	○	○
3. This organization considers safety at least as important as production and quality in the way work is done.	○	○	○	○	○
4. Workers and supervisors have the information they need to work safely. *	○	○	○	○	○
5. Employees are always involved in decisions affecting their health and safety.	○	○	○	○	○
6. Those in charge of safety have the authority to make the changes they have identified as necessary.	○	○	○	○	○
7. Those who act safely receive positive recognition.	○	○	○	○	○
8. Everyone has the tools and/or equipment they need to complete their work safely.	○	○	○	○	○

For the purpose of this survey:

- An audit means a formal process of evaluating and reporting on how the organization manages health and safety in accordance with a recognized standard (i.e. CSA Z1000, OHSMS 18001 or a Health and Safety Association audit).
- Regular means that an audit is repeated at regular intervals. For example, once every year or once every 2 years.

* In the OPM tool sent out to respondents by WorkSafeNB as part of this study, Item 4, shown correctly here, inadvertently repeated Item 4 from the IRSQ.