HHS Public Access

Author manuscript

J Occup Environ Hyg. Author manuscript; available in PMC 2021 December 15.

Published in final edited form as:

J Occup Environ Hyg. 2018 June ; 15(6): 502–509. doi:10.1080/15459624.2018.1453140.

Occupational Exposure Monitoring Data Collection, Storage, and Use Among State-Based and Private Workers' Compensation Insurers

Taylor M. Shockey[1,2], **Kelsey R. Babik**[1], **Steven J. Wurzelbacher**[1], **Libby L. Moore**[1], **Michael S. Bisesi**[2]

[1]Division of Surveillance, Hazard Evaluations, and Field Studies, National Institute for Occupational Health and Safety (NIOSH), Centers for Disease Control and Prevention

[2]Division of Environmental Health Sciences, College of Public Health, The Ohio State University

Abstract

Despite substantial financial and personnel resources being devoted to occupational exposure monitoring (OEM) by employers, workers' compensation insurers, and other organizations, the United States (US) lacks comprehensive occupational exposure databases to use for research and surveillance activities. OEM data are necessary for determining the levels of workers' exposures; compliance with regulations; developing control measures; establishing worker exposure profiles; and improving preventive and responsive exposure surveillance and policy efforts. Workers' compensation insurers as a group may have particular potential for understanding exposures in various industries, especially among small employers. This is the first study to determine how selected state-based and private workers' compensation insurers collect, store, and use OEM data related specifically to air and noise sampling.

Of 50 insurers contacted to participate in this study, 28 completed an online survey. All of the responding private and the majority of state-based insurers offered industrial hygiene (IH) services to policyholders and employed one to three certified industrial hygienists on average. Many, but not all, insurers used standardized forms for data collection, but the data were not commonly stored in centralized databases. Data were most often used to provide recommendations for improvement to policyholders. Although not representative of all insurers, the survey was completed by insurers that cover a substantial number of employers and workers. The 20 participating state-based insurers on average provided 48% of the workers' compensation insurance benefits in their respective states or provinces. These results provide insight into potential next steps for improving the access to and usability of existing data as well as ways researchers can help organizations improve data collection strategies. This effort represents an

Corresponding Author: Taylor Shockey (tshockey@cdc.gov).

HUMAN PARTICIPANT PROTECTION

This study was determined to be exempt research activity (Protocol # 2016E0186) under 45 CFR 46.101(b)(2) by The Ohio State University Institutional Review Board (IRB).

opportunity for collaboration among insurers, researchers, and others that can help insurers and employers while advancing the exposure assessment field in the US.

Keywords

exposure monitoring; industrial hygiene; workers' compensation; exposure assessment; public health

INTRODUCTION

An essential activity in public health is occupational exposure surveillance, which is commonly defined as the continuous collection, management, analysis, interpretation, and dissemination of data with the goal of improving the health among the working population [1, 2]. Obtaining data on employees' exposures to occupational hazards, such as chemical, biological, physical, and ergonomic factors, is integral to evaluating possible links to adverse health outcomes. A better understanding of the distribution and frequency of any exposure allows for reduction or elimination of the exposure and prevention of adverse health effects. The focus of this project was occupational exposure monitoring (OEM) data, specifically air and noise sampling data, collected by selected private and state-based workers' compensation (WC) insurers.

OEM data have not been commonly collected on a large-scale by public health researchers or those in academia, as the data collection and analysis are resource intensive. This type of data, however, is frequently collected by companies themselves, their WC insurers or consultants, or by a regulatory organization such as the United States (US) Occupational Safety and Health Administration (OSHA). For example, since 1978, OSHA's Integrated Management Information System (IMIS) has compiled OEM data from OSHA enforcement and consultation visits and contains more than 1.6 million exposure samples [3–5]. While the IMIS database is familiar to researchers, many public health practitioners are unaware that OEM data are also collected by WC insurers. One aim of this study was to increase the awareness among public health practitioners regarding WC insurers' OEM data. Building relationships between WC insurers and public health practitioners could be beneficial to both parties. Public health researchers could gain access to new OEM data sources and WC insurers may gain insight into more efficient data collection and storage practices, as well as new ideas for using their OEM data to promote their businesses and help their customers. In addition, the public health perspective could encourage WC to pool OEM data collected over a period of time at the same site and to use new methods for analyzing their OEM data to promote health and safety, such as predictive models.

WC systems are the largest source of occupational injury information in the US, with millions of claims in some single state databases [6]. In addition, WC insurers collect OEM information on insured employers through risk and control assessments. WC insurers also offer prevention services and programs, including onsite consultation services for ergonomics, safety, and IH as well as training and grant programs [7]. The market for WC insurance is complex with options for employer self-insurance; insurance coverage through a private insurer; through a competitive state-based insurer, or through a required, exclusive

state-based insurer. Private and state-based WC insurers operate differently, have access to varying levels of resources, and are subject to different regulations. Some state-based WC insurers are fully independent and compete on the private market like private WC insurers, however, others are run by the states themselves under the purview of the state government. The majority of WC insurance is written by private WC insurers; state-based WC insurers account for only approximately 15.5% of the WC market [7]. However, among the 23 states with state-based insurers, state-based insurers provide on average 39% of the workers' compensation benefits within these states and seven states currently cover the majority of benefits within their states[7]. This overall WC system information has tremendous potential for exposure control and prevention purposes, but remains underutilized by both public health researchers and the WC insurers themselves.

Use of WC claims data has been increasing in research recently. Several studies have analyzed a state's WC claims data to show the frequencies of several types of occupational injuries and their associated economic costs specific to type of diagnosis and industry [8, 9]. Additionally, researchers have used claims data to evaluate trends over time, such as rates of injuries by industry or by cause [6, 10]. The most common primary uses of WC insurers' OEM data have been to address a specific workplace process problem or to assess a company's compliance with regulatory standards [11]. External practitioners and researchers as well as WC insurers could utilize the data on a larger scale to understand industry- and process-related exposures, to identify effective controls, and to inform policy decisions [2]. However, efforts to explore and use these OEM data to develop a better means of collection and access for secondary uses have been minimal [12]. The purpose of the current study was to explore the research and business potential of insurer OEM data by conducting a survey of the air and noise sampling data practices among selected private and state-based WC insurers and through a brief review of other existing OEM databases.

METHODS

Study Sample Selection

State-based WC insurers were identified via membership in the American Association of State Compensation Insurance Funds (AASCIF). AASCIF is comprised of all US state-based WC insurers, and eight WC boards in Canada. Most of the 26 US AASCIF members are restricted to writing WC insurance within their own state, while the eight Canadian AASCIF members provide insurance only within the province in which they are located [13].

Private WC insurers were first identified from a list of the top 100 WC insurers in terms of market share and direct premiums written in 2015. The list included state WC insurers who were part of AASCIF, so they were removed to restrict the sample to private insurers. Of those private insurers, the authors determined which they had a professional contact within to create a list of those they were able to reach out to directly. The resulting list of private insurers with which the authors had a professional contact included 16 of the top 100 WC insurers and all were asked to complete the survey.

Survey Development and Distribution

The survey was intended to capture a general overview of the air and noise data collection and reporting practices among insurers (Supplemental File). Survey questions were developed to determine levels and composition of IH employees, which assesses the quantity of IH services in terms of staffing and the quality of IH services in terms of appropriate certification. Additional survey questions sought to determine the services provided, specific data elements collected, and how the data were stored, used and shared. The questions were designed to elicit objective responses and used multiple-choice formats where possible, for ease of aggregating results. SurveyMonkey®, a free online electronic survey website, was used to create, disseminate and conduct the survey. To distribute the survey to the state-based insurers, the online survey link was emailed to all AASCIF members by the head of the AASCIF safety committee. For private insurers, individual emails, that included a unique ID and link to the online survey, were sent to each of the 16 companies identified. In addition to the online survey link, a document explaining the purpose of the survey was emailed to each state-based and private company (Supplemental File).

Each insurance company was given several weeks to complete the survey. After approximately one month, a follow-up email was sent to each insurance company that had not responded. While private insurers that had not responded were not contacted again after the follow-up email, state-based insurers were contacted by phone. Survey follow-up differed between state-based and private insurers because most email addresses used to contact AASCIF organizations for follow-up were not linked to a person, but to a general inquiry address. The follow-up phone call provided an opportunity to seek out employees within the risk control or IH department who would be knowledgeable about their company's IH services and sampling data. After receiving responses from the follow-ups and concluding the survey, each completed survey was checked to ensure skip patterns had been followed where necessary.

RESULTS

Private WC Insurers

Eight of the selected 16 private WC insurers completed the survey. All eight of the participating private WC insurers were among the top 75 WC insurance providers in terms of market share with three of the eight private insurers being among the top 20 WC insurance providers. All eight insurers that responded to the survey reported conducting noise monitoring using their own IH staff, and the majority also reported conducting air sampling with their IH staff for their policyholders (Table 1). Out of the eight insurers, seven reported storing their sampling data either in a database as individual documents (e.g. PDFs, Word documents) or in a database, with data elements entered into Excel, Microsoft Access, etc. (Table 1). Of the six insurers that responded to the question of how their organization uses the data, all reported using the data to provide their policyholders with reports and recommendations. Of the seven insurers that had a required list of sampling data elements to be collected, all reported recording date, company name, sampling equipment/type, and sample time (Table 2). The average number of reported certified industrial hygienists

(CIHs), and non-certified industrial hygienists employed by the insurers was three and one, respectively (Table 3).

State-Based WC Insurers

Of the 34 state-based WC insurers contacted to participate in the survey, 20 completed the survey; 18 were US-based and 2 were Canadian-based. The 20 participants provided, on average, 48% of the workers' compensation insurance benefits in their respective states or provinces [7]. Of the 20 participating insurers, eight reported that they did not provide IH services to their policyholders, while 10 reported conducting noise monitoring using their own IH staff and eight reported conducting air sampling using their own IH staff. Of the 12 insurers that collect air or noise sampling data, nine reported storing their data filed as separate documents while three reported that they do not retain any sampling data permanently (Table 1). Of the six insurers that do have a required list of sampling data elements to be collected, all reported recording date, company name, job location, personal protective equipment used, engineering controls in place, sampling equipment/type, sample time, flow rate, and calibration (Table 2). The average number of reported CIHs and non-certified industrial hygienists employed by the insurers was one and one, respectively (Table 3).

DISCUSSION

The survey provided information, not previously published, on the nature of air and noise sampling data collection, storage, and usage among selected private and state-based WC insurance companies. Every responding private WC insurer and the majority of state-based WC insurers reported that they collect air and/or noise sampling data. The majority of respondents, both private and state-based WC insurers, reported storing their sampling data as separate documents or electronic images instead of in a centralized, electronic database. Lastly, the responding private and state-based WC insurers reported using the sampling data in variety of ways, most commonly to provide reports to their policyholders.

Need for Standardization of OEM Data Collection

The need for OEM data has been increasing, as this type of data has numerous applications in occupational hazard surveillance for disease prevention; in establishing dose-response relationships and exposure profiles; in risk assessment; and in the creation and evaluation of risk management programs [14, 15]. There is also a business need for OEM data, and standardizing data collection and reports for noise/air sampling would improve the use of data within WC insurers in several ways. For example, standardized OEM data can help insurers anticipate which client employers will need industrial hygiene service and aid in recognizing hazards early in the risk control process. Through the tracking of exposure levels and survey types (e.g. noise, air, ergonomics) by client industry and geographical region, insurers can allocate resources (e.g. staff time and expertise level, travel expenses, sampling equipment, and lab fees) more efficiently, and plan accurate budgets. Standardized systems could help insurers evaluate risks across a book of business and recommend evidence-based industry controls. Additionally, WC insurers conduct OEM site visits to their customers' facilities for a variety of reasons, including servicing an account (e.g. providing

risk control services to an account) and determining OSHA compliance; these services may be performed by in-house or contracted personnel. Having a standardized collection form would help to evaluate and improve the quality and consistency of the resulting IH reports, no matter who completes the survey. By having a more robust dataset for evaluating occupational exposure hazards, insurers will be better positioned to provide guidance on how to control these hazards, thereby reducing adverse health effects, potentially leading to fewer future claims. Pooled data within a single insurance company and across multiple WC insurers may be especially useful for identifying emerging hazards, understanding risk, and sharing best practices for assessment and prevention. In short, standardizing OEM data collection can help insurers save money while maximizing service value to reduce or eliminate client risks.

Based on the survey results from the 28 participating insurers, it is clear that a significant amount of OEM air and noise sampling data exists within the participating insurers. However, the current lack of standardization among insurers and accessibility may limit usability for research, surveillance, and for business purposes within the insurance industry. More than 40% of participating state-based WC insurers reported that they do not have a standardized data collection tool. A recent study using WC claims and noise/air sampling data illustrated the research potential of insurer OEM data but also a need for standardization. Specifically, the study demonstrated that insurer OEM data could be used to understand the link between traumatic injury and noise level, but researchers also found that the reporting of measurements was not systematic, making the data difficult to extract and use [(16)]. To improve and expand upon usability, the researchers recommended that the reports written by industrial hygienists follow a standardized process [(16)].

To enhance analyses of the data and allow for aggregation across organizations or worksites, a joint task group of the American Conference of Governmental Industrial Hygienists (ACGIH) and the American Industrial Hygiene Association (AIHA) in 1998 recommended specific standardized data elements that should be recorded for air and noise sampling[(17)]. A working group on exposure registers in Europe developed a similar list to ACGIH-AIHA's own list of exposure data elements [(18)]. While the ACGIH-AIHA established a list of OEM data elements for air and noise sampling, little has been done since to evaluate the elements or encourage their use among public and private sector industrial hygienists. With improvements in technology, including the creation of computerized commercial systems for data collection, NIOSH recently completed a project to examine the IH forms that exist among both public and private organizations, including several WC insurers. By identifying common elements among the different organizations' IH forms as well as the list from the ACGIH and AIHA, NIOSH was able to create an updated OEM data collection form and begin the process for distribution into the field [(19)].

Private and state-based WC insurers that reported using a standardized data collection form varied in terms of the data elements they collect. This lack of data collection standardization exists among IH professionals not only within the private sector (i.e. WC insurers), but also within academia and research organizations including NIOSH. It has been noted that one of the biggest shortcomings of OEM data is a lack of information on work conditions or other factors associated with the potential exposure problem. When taken alone, the

exposure results do not have much meaning without also knowing variables such as job, industry, weather, equipment used, work process, chemicals or materials used and quantities, sampling strategy, and demographics [14]. This lack of core information, along with a lack of standardized data in an accessible format, are likely reasons as to why the US has yet to move forward in creating comprehensive exposure databases. Improved methods for standardization as well as development of a strong business case could be catalysts for the sharing of OEM data among WC insurers to make use of the data more efficient and effective.

Need for Increased OEM Data Accessibility and Electronic Databases

While other countries have built large-scale exposure databases, the US has remained stagnant in building robust occupational exposure assessment and exposure databases [1, 2, 20–25]. Within the US, OSHA's IMIS database remains one of the largest sources of OEM data but it is subject to sampling bias and is not a representative source of OEM data [3–5]. For example, the workers that are chosen to be monitored during an OSHA visit are most frequently those who are known to have the highest exposures [3]. By contrast, the International Agency for Research on Cancer (IARC) created an exposure database using data from 19 centers in 15 different European countries to examine possible cancer risks within the pulp and paper product industries [20]. By creating the database, researchers were able to mine and collect over 31,000 measurements on 246 different chemicals related to the paper industries. A significant portion of these measurements were previously unpublished data that participating countries were simply not using [20]. Canada developed the Canadian Workplace Exposure Database (CWED) and the resulting CARcinogen Exposure (CAREX Canada) [21]. The CWED is Canada's main source of occupational exposure monitoring data and has been expanded in recent years after receiving funding to transfer paper-based data into electronic databases. It now contains approximately 460,000 occupational exposure measurements across six territories [22].

Additional examples of countries building large-scale OEM databases include Finland, France, and Germany. The Finnish Institute of Occupational Health (FIOH) maintains several different databases on exposures including the Finnish Job-Exposure Matrix (FINJEM). FINJEM has successfully combined data from multiple FIOH databases, while supplementing this data with information on industries and the labor force [23]. France has maintained a database since 1987, known as COLCHIC, for OEM data from regional health insurance funds, laboratories, and the French national research and safety institute. Upon recognizing the ability to utilize the data was limited due to quality issues and the absence of relevant data elements, a working group was created to reorganize and improve the COLCHIC database through an updated coding and data retrieval system [24].

Across the world, organizations have put OEM databases into place and continued to improve upon their collected data elements and coding systems over the past several years. These organizations have worked to incorporate multiple OEM data sources into these databases in order to enhance data applications and increase overall data usability. Germany's MEGA exposure database has stored information on hazardous substances since 1972 and contains over 1.6 million measurement values [25]. The information stored in

MEGA was originally collected for insurance purposes, however, the standardized data collection process has allowed the MEGA data to be used for a variety of purposes including statistical analyses on trends, particular substances, working areas, or capture systems as well as to determine the effectiveness of organizational protective measures [25]. With the development of centralized, electronic databases and a consensus set of standardized data elements, it may be feasible for researchers and practitioners within the US to collaborate in a similar way as WC insurers, NIOSH, and OSHA programs expand the use and interpretation of available OEM data.

Limitations

Although this study provided insight into air and noise sampling data collected through workers' compensation systems, there are several limitations. First, the survey was brief and the multiple-choice format could not capture all possible answers through the restricted options listed. Second, the survey was sent to all AASCIF members in order to sample state-based insurers and two of the 20 state-based insurers that completed the survey were Canadian. Canadian insurers likely vary in operation, in industry, and in regulations observed compared to US insurers. For this reason, their survey answers may be inherently different from the US insurers' answers.

Another main limitation was that the sample of private WC insurers was not random, and likely is not representative of all private WC insurers. While private WC insurers were identified from an unbiased list of the top 100 WC insurers in the US based on market share, only those for which the authors had phone and email information were contacted, which may have introduced a selection bias. The selection of authors' contacts most likely biased results toward more robust programs, since those programs had already chosen to engage with NIOSH. Although the survey was not representative of all insurers, the survey was completed by insurers that cover a substantial number of employers and workers in the US. Over 50% of the state-based insurers participated and the 20 participating state-based insurers on average provided nearly half of the workers' compensation insurance benefits in their respective states or provinces.

CONCLUSIONS

The survey in this study provides preliminary information on OEM data practices among WC insurers and serves as a first step in exploring what OEM data may exist among these insurers. In the future, additional, in-depth surveys examining OEM data would also be helpful to determine directions for collaboration and data application, both in research and in business. These surveys could examine in more detail a range of topics such as what substances or agents are most commonly monitored among WC insurers; reasons for sampling visits by WC insurers; willingness to share data; more detail on how insurers are collecting and using OEM data including how insurers identify which businesses to monitor. In addition, evaluation of WC insurers' willingness to pool OEM data is important. Pooling OEM data across insurers would provide a robust dataset for evaluating exposure risks and prevention methods and allow insurers adding clients from new industries and occupations to anticipate the OEM needs of those clients using information from the pooled database.

Additionally, the surveys could go beyond WC insurers to a wider network of professional industrial hygienists to gain a better understanding of industrial hygiene practice in general as well as new insights into improving OEM data and the ability to link OEM data to outcome data.

The use of WC injury and illness claims data has grown over the past several years, while OEM data collected by WC insurers has remained understudied. No prior research has attempted to determine what OEM data may be available among these companies in the US. This study shows that OEM air and noise sampling data does exist in some form among many private and state-based WC insurers. While previous research within the US to improve OEM data collection and storage, such as the ACGIH-AIHA's creation of an OEM data elements list in 1998, has not led to significant change. The current study results indicate that the need for standardization and centralized databases still exists. New research and partnerships can move forward to establish methods for improving the data quality, accessibility for secondary uses, and applications. The OEM data from WC insurers may prove valuable in determining exposure burden and trends in future studies and help to better inform measures to control worker exposures.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

ACKNOWLEDGEMENTS

The authors would like to thank the AASCIF members and the private workers' compensation insurers who donated their time to complete the survey.

REFERENCES

1. Kauppinen T and Toikkanen J: Health and hazard surveillance – needs and perspectives. Scand J Work Environ Health. 25(suppl 4):61–67 (1999). [PubMed: 10628443]
2. LaMontagne AD, Herrick RF, Van Dyke MV, Martyny JW, and Ruttenber AJ: Exposure databases and exposure surveillance: Promise and practice. Am Ind Hyg Assoc J. 63(2):205–212 (2002).
3. Henn SA, Sussell AL, Li J, Shire JD, Alarcon WA, and Tak S: Characterization of lead in US workplaces using data from OSHA's Integrated Management Information System. Am J Ind Med. 54:356–365 (2011). [PubMed: 21246587]
4. Lavoue J, Friesen MC, and Burstyn I: Workplace measurements by the US Occupational Safety and Health Administration since 1979: Descriptive analysis and potential uses for exposure assessment. Ann Occup Hyg. 57(1): 77–97 (2013). [PubMed: 22952385]
5. Sarazin P, Burstyn I, Kincl L, and Lavoue J: Trends in OSHA compliance monitoring data 1979–2011: Statistical modeling of ancillary information across 77 chemicals. Ann Occup Hyg. 60(4): 432–452 (2016). [PubMed: 26732821]
6. Wurzelbacher SJ, Al-Tarawneh IS, Meyers AR, Bushnell PT, Lampl MP, Robins DC, Tseng C, Wei C, Bertke SJ, Raudabaugh JA, Haviland TM, and Schnorr TM: Development of methods for using workers' compensation data for surveillance and prevention of occupational injuries among state-insured private employers in Ohio. Am J Ind Med. 59:1087–1104 (2016). [PubMed: 27667651]
7. McLaren CF, and Baldwin ML: Workers' Compensation: Benefits, Coverage, and Costs (2015 data). National Academy of Social Insurance: Washington, DC. 10, 2016.

8. Dunning KK, Davis KG, Cook C, Kotowski SE, Hamrick C, Jewell G, and Lockey J: Costs by industry and diagnosis among musculoskeletal claims in state workers compensation system: 1999–2004. Am J Ind Med. 53:276–284 (2010). [PubMed: 19937981]
9. Mroz TM, Carlini AR, Archer KR, Wegener ST, Hoolachan JI, Stiers W, Shore RA, and Castillo RC: Frequency and cost of claims by injury type from a state workers' compensation fund from 1998 through 2008. Arch Phys Med Rehab. 95(6):1048–1054 (2014).
10. Lipscomb HJ, Schoenfisch AL, Cameron W, Kucera KL, Adams D, and Silverstein BA: Contrasting patterns of care for musculoskeletal disorders and injuries of the upper extremity and knee through workers' compensation and private health care insurance among union carpenters in Washington State, 1989 to 2008. Am J Ind Med. 58(9):955–963 (2015). [PubMed: 25939759]
11. Gomez MR, and Rawls G: Conference on occupational exposure databases: a report and look at the future. Appl Occup Environ Hyg. 10(4):238–243 (1995).
12. Gomez MR: Recommendations for optimizing the usefulness of existing exposure databases for public health applications. Am Ind Hyg Assoc J. 58(3):181–812 (1997).
13. American Association of State Compensation Insurance Funds (AASCIF): "AASCIF – About Us." Available at http://www.aascif.org/index.php?page=about-us (accessed April 14, 2017).
14. Gomez MR: Exposure assessment must stop being local. Appl Occupa Environ Hyg. 15(1):15–20 (2000).
15. Lemen RA: (1995). Role of exposure databases in disease surveillance and occupational epidemiology. Appl Occup Environl Hyg. 10(4):400–401 (1995).
16. Estill CF: "Are noise and neurotoxic chemical exposures related to workplace accidents" PhD Diss., Department of Environmental and Occupational Health, College of Medicine, University of Cincinnati, Cincinnati, Ohio, 2015.
17. Lippman M, Gomez MR, and Rawls GM: Data elements for occupational exposure databases: Guidelines and recommendations for airborne hazards and noise. Appl Occup Environ Hyg. 11(11):1294–1311 (1996).
18. Rajan B, Alesbury R, Carton B, Gerin M, Litske H, Marquart H, Olsen E, Scheffers T, Stamm R, and Woldbaek T: European proposal for core information for the storage and exchange of workplace exposure measurements on chemical agents. Appl Occup Environ Hyg. 12(1):31–39 (1997).
19. Babik KR, Shockey TM, Moore L, and Wurzelbacher SJ: Standardizing industrial hygiene data collection forms used by workers' compensation insurers. Manuscript in preparation (2017).
20. Kauppinen T, Teschke K, Savela A, Kogevinas M, and Boffetta P: International data base of exposure measurements in the pulp, paper and paper products industries. Int Arch Occ Env Hea. 70:119–127 (1997).
21. Peters CE, Ge CB, Hall AL, Davies HW, and Demers PA: CAREX Canada: An enhanced model for assessing occupational carcinogen exposure. Occup Environ Med. 72:64–71 (2014). [PubMed: 24969047]
22. Hall AL, Peters CE, Demers PA, and Davies HW: Exposed! Or not? The diminishing record of workplace exposure in Canada. Can J Public Health. 105(3):e214–e217 (2014). [PubMed: 25165842]
23. Kauppinen T: Finnish Occupational Exposure Databases. Appl Occup Environ Hyg. 16(2): 154–158 (2001). [PubMed: 11217703]
24. Vincent R, and Jeandel B: COLCHIC – Occupational exposure to chemical agents database: Current content and development perspectives. Appl Occup Environ Hyg. 16(2): 115–121 (2001). [PubMed: 11217697]
25. Gabriel S: The BG measurement system for hazardous substances (BGMG) and the exposure database of hazardous substances (MEGA). Int J Occup Saf Ergo, 12(1): 101–104 (2006).

Table 1.

Collection, storage, and usage practices among private and state-based workers' compensation insurers.

	Private Insurers		State-based Insurers	
	Percentage (%)	**N**	**Percentage (%)**	**N**
Does your organization provide industrial hygiene services to policyholders? [Select all that apply]				
Yes, our employees conduct noise monitoring	100.0	8	50.0	10
Yes, our employees conduct air sampling	75.0	6	40.0	8
Yes, a 3rd party contractor conducts noise monitoring	0.0	0	15.0	3
Yes, a 3rd party contractor conducts air sampling	0.0	0	20.0	4
No, we do not provide industrial hygiene services	0.0	0	40.0	8
How does your organization store the collected industrial hygiene data? [Select all that apply]				
In a database, filed as individual Word documents, PDFs, scanned images, etc	62.5	5	75.0	9
In a database, with data elements entered into Excel, Microsoft Access, etc	25.0	2	0.0	0
We don't retain any industrial hygiene data after providing it to our policyholders	25.0	2	25.0	3
Which of the following ways has your organization's industrial hygiene data been used by its own employees for purposes internal to your organization or policyholders? [Select all that apply]				
To create reports on the usage of IH services	50.0	3	55.6	5
In conjunction with claims data to determine the association between IH exposure and claims data	66.7	4	44.4	4
To examine trends in exposure (e.g. noise, lead, silica) by industry/occupation	50.0	3	22.2	2
To evaluate the effectiveness of safety programs or control measures implemented by your organization	66.7	4	33.3	3
To supply reports and/or recommendations to policyholders after IH monitoring has been performed at their worksite	100.0	6	88.9	8
Has your organization's industrial hygiene data ever been used by outside people or agencies (e.g. people affiliated with academic institutions, government agencies, etc.) for research purposes?				
Yes	14.3	1	20.0	2
No	85.7	6	80.0	8

Table 2.

Standardized data elements collected by private and state-based workers' compensation insurers.

Data Elements	Private Insurers		State-based Insurers	
	Percentage (%)	N	Percentage (%)	N
We do not have a standardized data collection form or list of data elements that must be collected	12.5	1	50.0	6
Date	87.5	7	50.0	6
Company Name	87.5	7	50.0	6
ID/Policy Number	75	6	41.7	5
Job Title (of person being monitored)	62.5	5	41.0	5
Industry and/or Occupation Code (e.g. U.S. Census Bureau job codes, NAICs codes, etc)	0	0	8.3	1
Job Location	75	6	50.0	6
Specific Equipment Operated by Monitored Worker	62.5	5	41.7	5
Personal Protective Equipment Used	37.5	3	50.0	6
Engineering Controls in Place	37.5	3	50.0	6
Work/Task Description	50	4	41.7	5
Exposure Duration (e.g. number of hours per day)	37.5	3	33.3	4
Exposure Frequency (e.g. daily, weekly, etc)	37.5	3	25.0	3
Number of Similarly Exposed Employees	25	2	41.7	5
Weather Conditions	0	0	41.7	5
Sampling Equipment/Type	87.5	7	50.0	6
Sampling Method	62.5	5	41.7	5
Analytical Technique	62.5	5	33.3	4
Analyte Monitored (e.g. noise, lead, silica, etc)	75	6	41.7	5
Sample Time	87.5	7	50.0	6
Flow Rate	62.5	5	50.0	6
Total Volume	62.5	5	41.7	5
Calibration Performed	50	4	50.0	6
Results (e.g. TWA, STEL, Dose, Average SPL, Peak, etc)	75	6	41.7	5
Other	12.5	1	33.3	4

Table 3.

Certified industrial hygienists (CIHs) and other industrial hygiene related employees among private and state-based workers' compensation insurers.

	Private Insurers (N)	State-based Insurers (N)
Number of certified industrial hygienists whose primary duty is industrial hygiene monitoring		
Average	3	1
Minimum	0	0
Maximum	16	4
Number of generalists or non-certified industrial hygienists whose primary duty is industrial hygiene monitoring		
Average	1	2
Minimum	0	0
Maximum	6	20
Number of certified industrial hygienists whose primary duty is not industrial hygiene monitoring		
Average	1	1
Minimum	0	0
Maximum	6	5