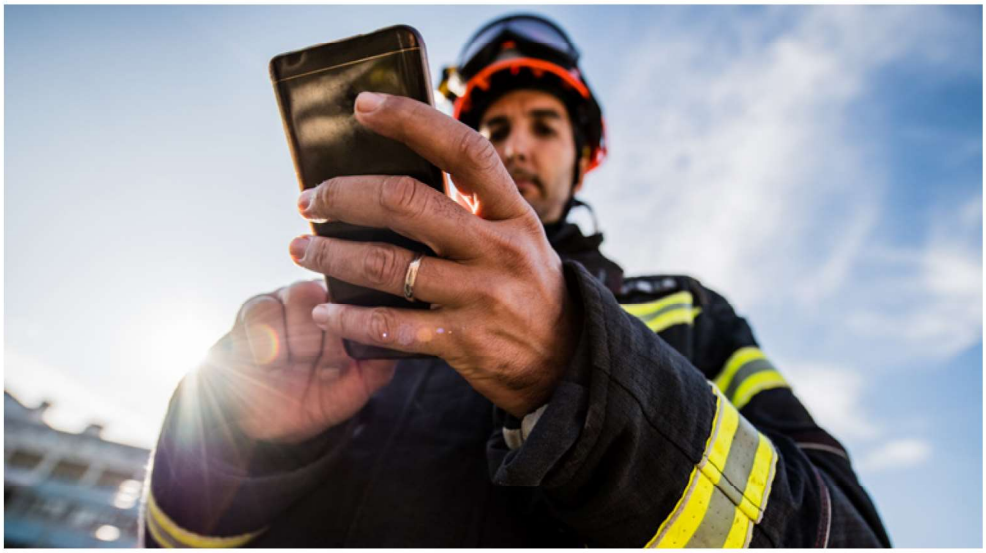
Safety in Numbers: The Power of Data to Protect Public Sector Workers

By Katherine Barrett and Richard Greene

Police, firefighters, paramedics, nurses, corrections officers, social workers and many others employed by cities, counties and state governments are concerned about safety. So, too, are the people they serve.

Obvious ways to create safer work environments include providing appropriate equipment and issuing clear-cut guidelines. Often-overlooked tools to protect public servants from physical and emotional trauma are gathering, analyzing and disseminating data.



Fire Services Lead the Way

Fire departments have done more than other public agencies to use data to improve employees' health and safety. The practice has evolved over many years, and "the fire service has a lot to teach other industries," said Jennifer Taylor, Ph.D., MPH, who directs the Center for Firefighter Injury Research and Safety Trends (FIRST) at Drexel University's Dornsife School of Public Health.

For example, when David Bernzweig joined the Columbus, Ohio, Division of Fire 25 years ago, he was given a journal in which to manually record exposures to industrial chemicals and other potential carcinogens at fires. Now, he and other Columbus firefighters record on-the-job exposures with a mobile phone app called NFORS that was developed by International Public Safety Data Institute.

Bernzweig's paper journal remained largely empty. "It's hard to keep up with that kind of thing," he recalled. "I didn't do it, and I don't know anybody who did."

Times have changed. Now a battalion chief and the division's health and safety officer, Bernzweig sees across-the-board compliance with requests to record health risks at each incident response. Identifying individuals who may have been exposed is also easier than ever.

NFORS, short for National Fire Operations Reporting System, can be downloaded by any firefighter in the United States or Canada. It is currently being used by more than 12,000 firefighters at some 2,000 fire departments. A version for police may soon be available. Recently, NFORS facilitated the collection and sharing of information on COVID-19 exposures and the need for personal protective equipment (PPE).

Prior to the pandemic, Columbus firefighters culled data from NFORS to convince the city council to approve attaching hoses to the tailpipes of idling fire trucks to prevent engine exhaust from making living spaces at firehouses more dangerous. A cost of $40,000 to $50,000 per firehouse had led councilmembers to reject the idea for years. "But the conversation changed because of the data, because of the awareness of exposure," said Bernzweig.

In a similar way, building a comprehensive record of exposures to toxic materials has led to fewer rejections of applications for workers' compensation and disability benefits due to occupational illnesses such as cancer. Lack of data was often cited as the reason to deny a claim. Additionally, the data is studied by individual fire departments and federal agencies to identify ways to reduce health risks.

Protecting the Protectors

Collecting data on physical and verbal assaults on emergency medical personnel has also become a priority in some jurisdictions. With more than 60 percent of calls to all U.S. fire departments being health-related, EMTs and paramedics often find themselves in threatening situations.

This is one of the reasons FIRST launched its Stress and Violence in Fire-Based EMS Responders (SAVER) system in 2017. SAVER tools help departments track traumatic incidents and their effects on first responders' mental health.

"We will be measuring mental health impact on a monthly basis," said Taylor. "What is the impact of extra work? Of stress? Of separation from family? We're creating space within fire and rescue departments to value data and use it for decision making."

Barriers to Data Use

The use of data to promote safety is growing across state and local governments. In particular, GPS devices are being used to pinpoint the times and locations of accidents, as well as to indicate where accidents may have been averted.

But barriers exist, especially for public sector human resources departments. A 2018 IPMA-HR benchmarking survey revealed that insufficient funding stood as the most common obstacle to implementing data analytics. Other factors that hamper the successful adoption of data analytics include lack of training and insufficient staff knowledge, lack of access to analytics software and lack of support from leaders.

In addition, local audits often point up weaknesses in data collection and analysis. For example, a 2018 audit of the Department of Utilities for the City of Sacramento, Calif., found that GPS devices in city vehicles indicated employees were exceeding speed limits and potentially creating hazards for themselves and residents.

However, that same audit revealed that 37 percent of the vehicles in the department's fleet were not being tracked. So, while the city seemed to have actionable safety data, the information was too incomplete to allow managers to develop general rules that might prevent collisions. A report on the audit states, "In our opinion, it is important for management to have complete data in order to make better management decisions."

The Sacramento utilities department audit report also cites flaws in the data produced by detectors designed to monitor air quality in enclosed areas. Separate software systems for devices from different suppliers sometimes produced measurements that did not match. Additionally, the report notes, as many as 50 detectors had not uploaded data for more than a year. Missing information meant the department had less ability to identify trends in air quality and the levels of gases "that could potentially create hazardous work environments."

Audits often highlight problems managers know exist but have not fully addressed. That was the case in Durham, N.C., where auditors in 2017 called attention to the city's safety program being decentralized and relying too little on shared practices and cross-departmental learning. The auditors also noted that in the absence of a citywide standard, employee safety training varied from department to department and insufficient efforts were being made to track and monitor training.

Since then, Durham has worked to ensure each department produces the same types of reports on accidents and injury claims. This allows managers to identify trends, common causes and areas where more training may be needed.

Standardizing data collection and sharing information have been particularly useful for addressing similar risks across multiple departments. For example, public works, water management, landscape services, general services and the parks department all sometimes require employees to haul equipment. When an analysis of the city's newly standardized data revealed a spate of crashes happening as drivers backed up trailers and haulers, department heads began looking for solutions.

Data Improves Firefighting in Dallas

Using data to build a strong safety culture takes time. At Dallas Fire-Rescue (DFR), multiple elements were put in place over the past eight years.

In 2012, Lauren Johnson, who was then a captain in the department, published a thesis she wrote while completing the Executive Fire Officer Program offered by the National Fire Academy. After noting the absence of a data-oriented culture at DFR, Johnson detailed the benefits other departments had realized by tracking injuries and near-misses.

Department leaders agreed with her conclusion that failing to collect "on-duty injury or near-miss data for analysis and reporting" left them unable to "identify corrective actions to reduce firefighter injury and death." They also admitted that budget concerns prevented improvements in data collection and analysis. Years passed without action being taken.

When Johnson was appointed deputy chief over safety about three years ago, she was assigned a small data team and given authorization to hire a new data analyst. While data collection remains a work in progress, the efforts of Johnson and her team are already helping the department make decisions about purchasing equipment and locating firehouses to enhance resident and employee safety by increasing the speed with which fire trucks and ambulances get to where they are needed.

DFR has also increased its ability to track the frequency and causes of injuries at fires. "We did research and chose new firefighting gloves, hoods and clothes that offer better protection," Johnson said. "The department also used data on material and garment performance to support these decisions because the cost of new gear is significant."

Most recently, according to Johnson, "We've been using data quite a bit to describe our city's experience with COVID."

Department staff collect data that leaders use to calculate and project the rate at which PPE is being used. "So, we know when we will run out and we can place orders," Johnson said.

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