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## Poisoned at Work

### An Updated Evaluation of New Hampshire Occupational Poisoning Calls to the Northern New England Poison Center from 2012 to 2014

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#### Introduction

In 2013, we published a report describing New Hampshire occupational poisoning calls to the Northern New England Poison Center (NNEPC) from 2005 to 2011.

That report can be found at [www.iod.unh.edu/OHSP/poisonedatwork-7-2013.pdf](http://www.iod.unh.edu/OHSP/poisonedatwork-7-2013.pdf).

This report provides new data describing occupational poisoning events reported to the NNEPC during the period of 2012 through 2014.

#### Overview

##### Data Source

The Northern New England Poison Center (NNEPC) is the regional, nationally accredited poison center serving Maine, New Hampshire, and Vermont. It provides a free, 24-hour poison emergency and information hotline that serves the general public and health care professionals and has interpretation services for over 150 languages. Each year, the NNEPC manages more than 30,000 poisoning exposures or cases, approximately 155 of which are New Hampshire occupational poisonings. A New Hampshire case means the call to the poison center came from New Hampshire, not necessarily the state where the workplace poisoning occurred or the residence of the patient.

An occupational poisoning case represents a single individual's contact with a potentially toxic substance

and can be self-reported or reported by someone calling on behalf of the patient (for example, a health care professional or co-worker). Not all NNEPC poisoning cases represent an injury. Sometimes the substance is not toxic or the amount to which the patient is exposed is not enough to cause toxicity. A patient can be exposed to one or multiple substances. A person may also only be calling to obtain information about a potential exposure.

#### Methods

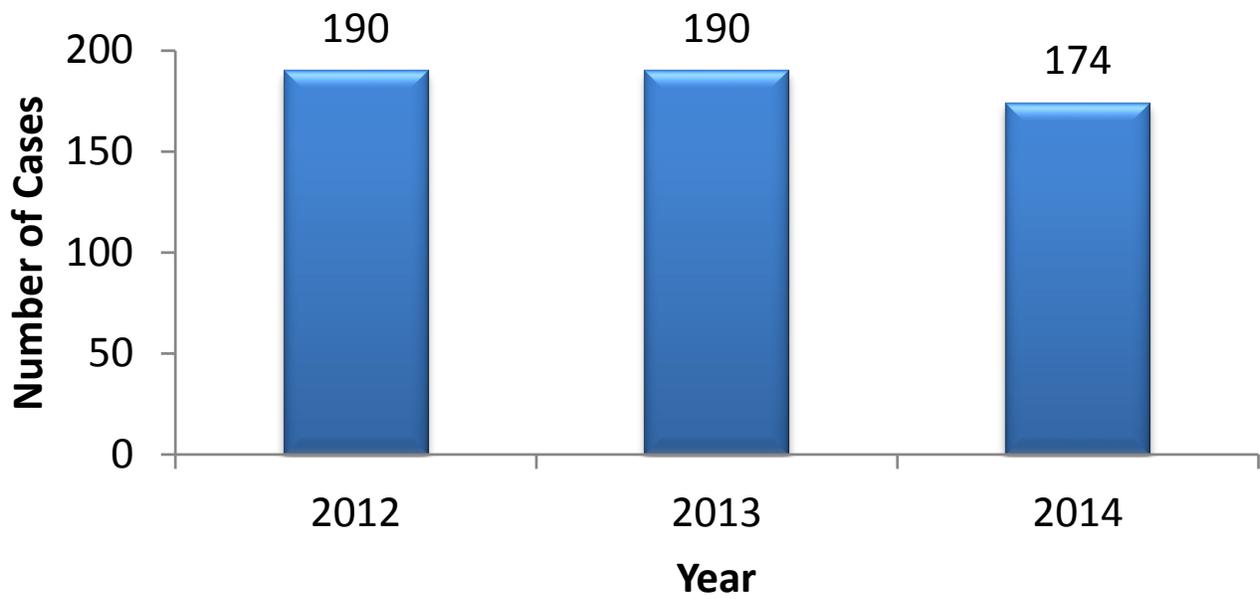
We analyzed occupational related data for New Hampshire cases reported to the NNEPC from 2012 to 2014. Only information necessary to do this study was transcribed from the records and included in the analysis. Any identifiers (names, phone numbers, industry names, etc.) were excluded from the data analyzed. Business type was transcribed as reported in the case narrative.

#### Results

##### Number of Cases (Figure 1)

During the 3-year period from 2012 to 2014, a total of 554 calls were made to the poison center from New Hampshire reporting occupational exposures to or concerns about harmful substances or environments.

**Figure 1. Number of Unintentional Occupational Poisonings Per Year**



**Top Five Substance Groups (Figure 2)**

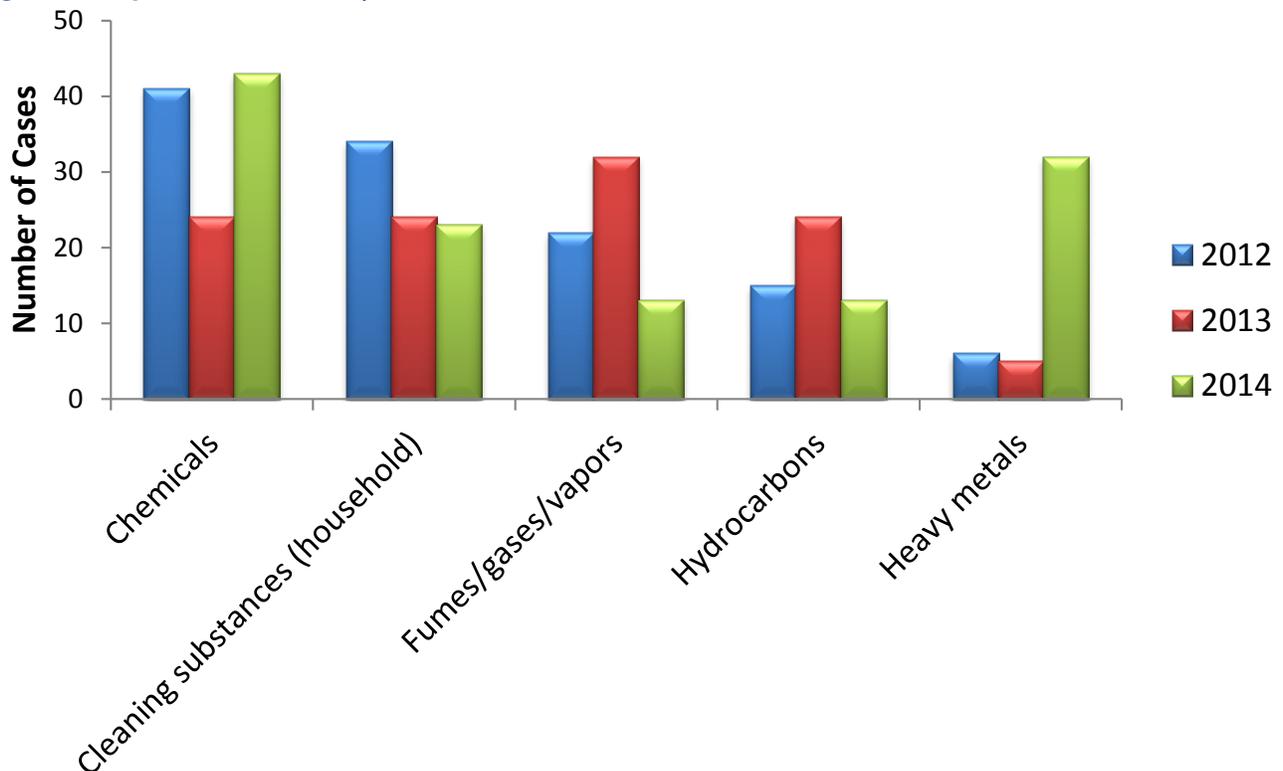
We analyzed the data for the top five substances that contributed to the most number of events involved in occupational poisonings, based on the American Association of Poison Control Centers generic categories. A patient may be exposed to one or more substances. Chemicals, cleaning substances, fumes/gases/vapors, heavy metals, and hydrocarbons are among the top contributors to occupational exposures in New Hampshire.

**Age and Gender (Figure 3)**

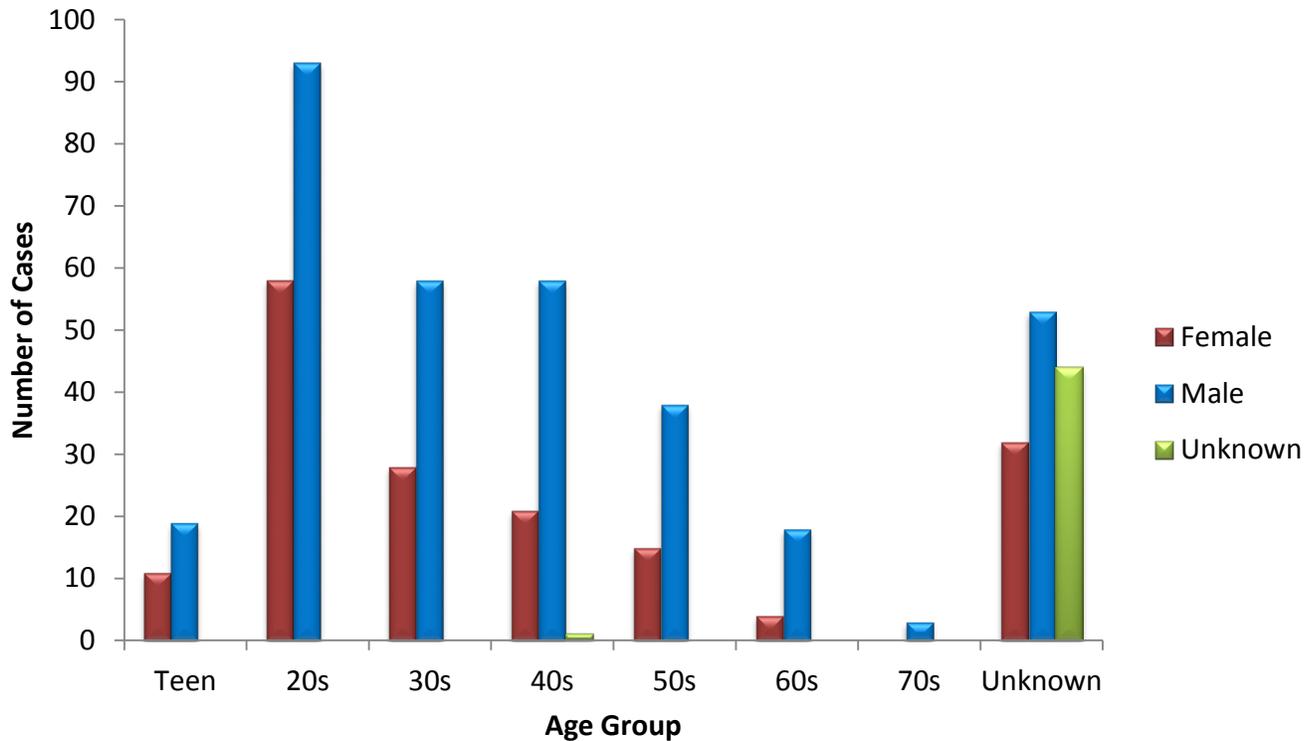
Among all age groups, the number of cases was greater for males than for females, and the most common age group for both genders was the 20's.

*\*Out of a total of 554 cases, 129 cases did not report the age of the patient and 44 cases did not report either the gender or age.*

**Figure 2. Top 5 Substances by Year**



**Figure 3. Age and Gender**



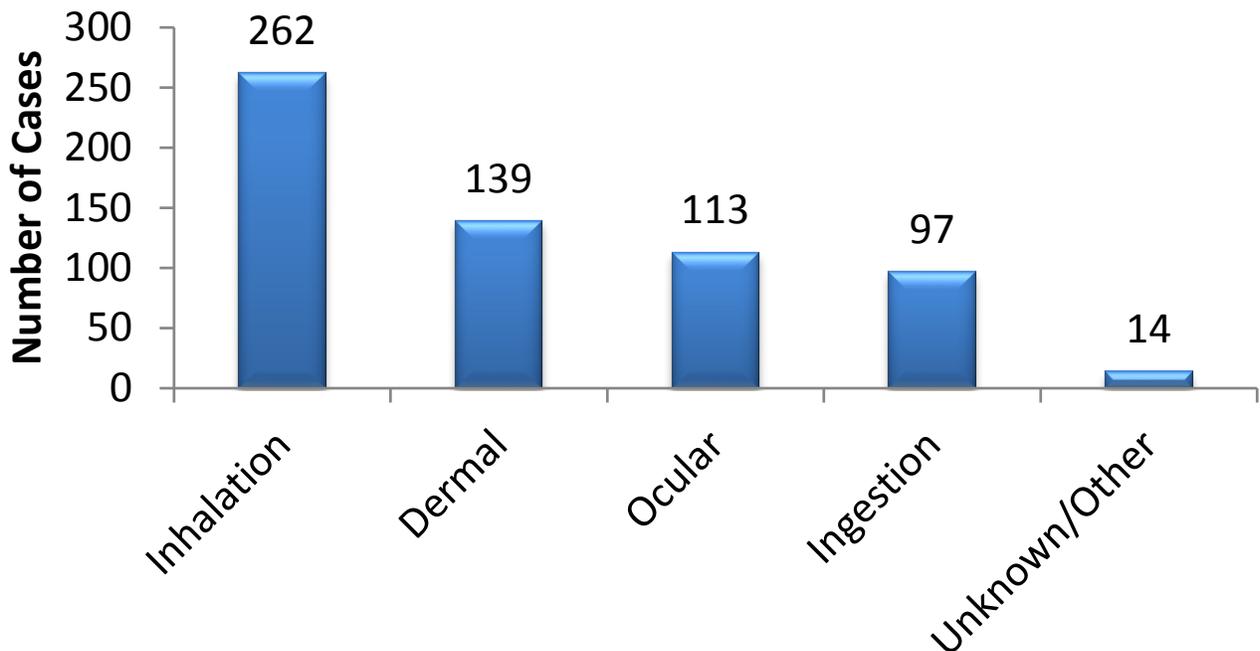
**Route of Exposure (Figure 4)**

Inhalation accounted for the majority of routes of exposure (42%), with dermal (22%), ocular (18%) and ingestion (16%), contributing to the remainder of all exposure routes. More than one route of exposure (e.g., a chemical that was both inhaled and came into contact with the skin) may be reported.

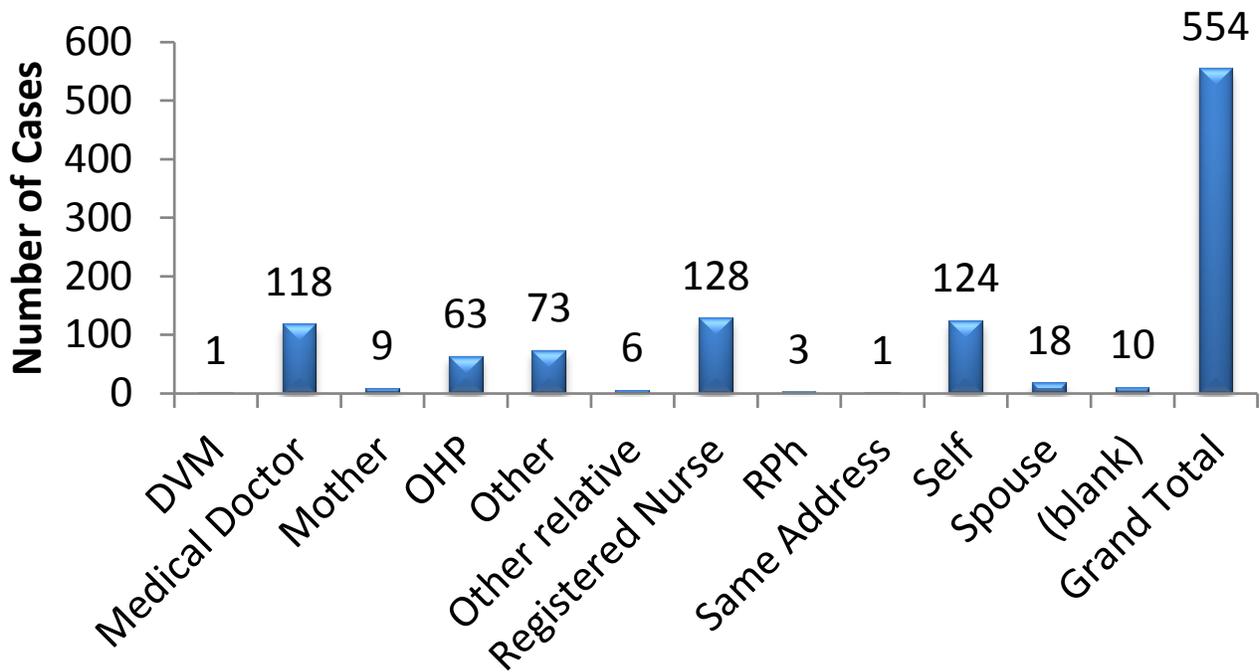
**Caller Relationship and Management Site**

The majority of the calls (44%) to the poison center came from medical providers in a healthcare facility (medical doctor and registered nurse, n=246). About 22% were self-reported (n=124), with the remainder coming from other relatives, occupational health professionals, pharmacists, and other (n=184). (Figure 5)

**Figure 4. Route of Exposure**



**Figure 5. Caller Related to Patient**

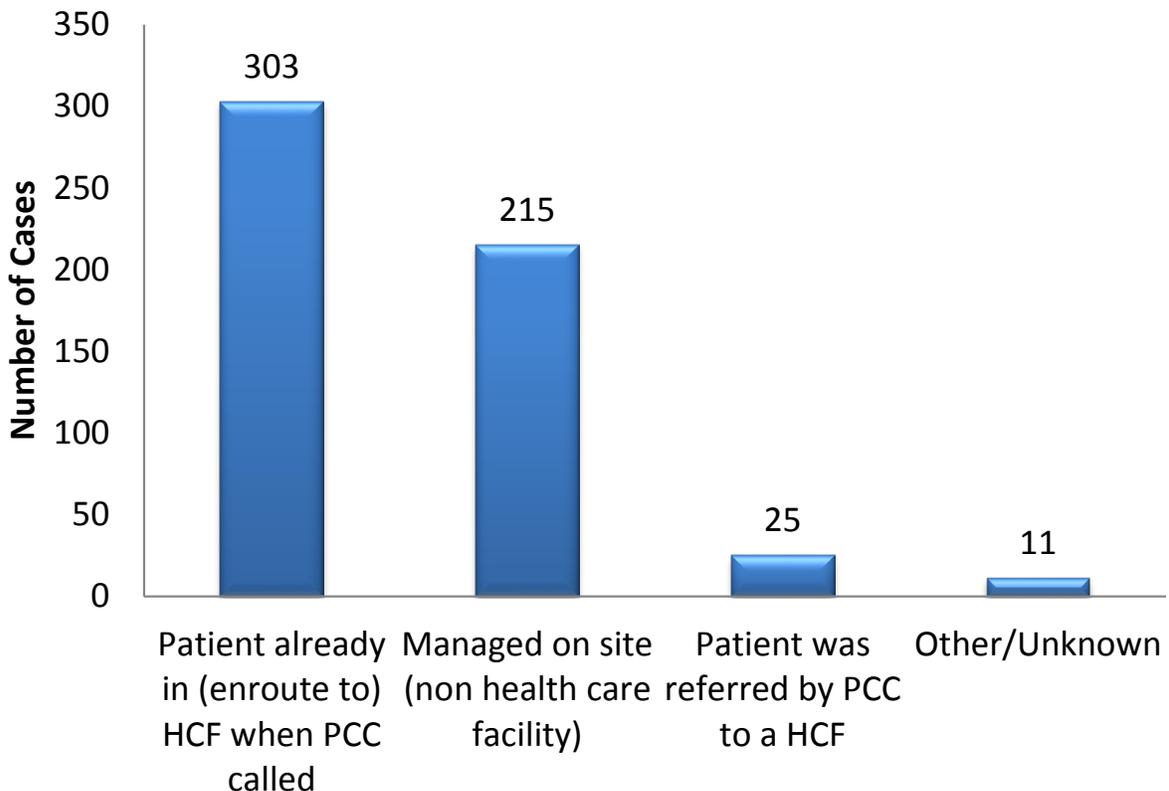


For the majority of the cases the patient was already in or en route to a healthcare facility (HCF), or the patient was referred by the poison center to go to a HCF. Nearly half of the cases were managed on site, with an expert phone consultation from the poison center staff. (Figure 6)

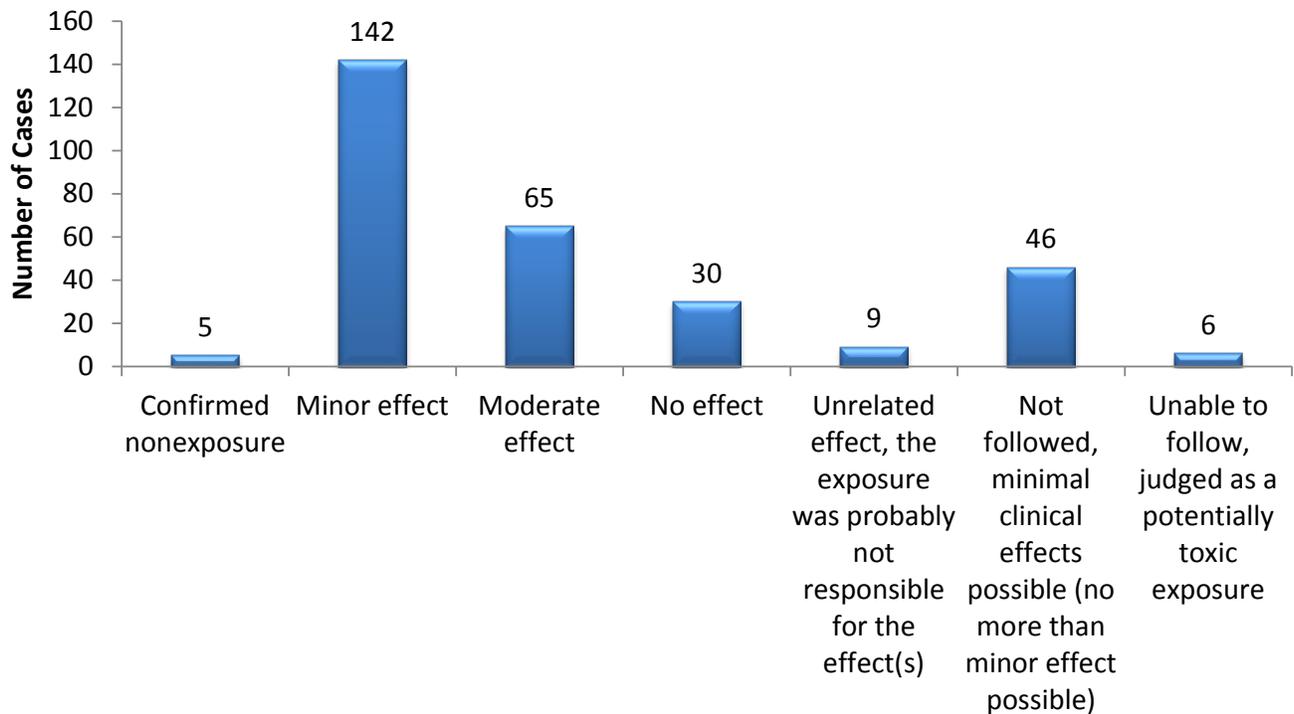
**Medical Outcome (Figure 7)**

Of the 303 poisonings that resulted in medical management in a health care facility, outcomes resulted in minor effects (n= 188) and moderate effects (n=65). Occupational exposures not treated in a healthcare facility most commonly resulted in minor effects where cases were not followed (n=161).

**Figure 6. Management Site**



**Figure 7. Patient already in (en route to) Health Care Facility**



An additional 25 resulted in minor effects and were followed.

### Reported Business Type

While many of the cases did not report a business type (n=277), the remaining majority of the cases represented the healthcare, building trades, garage/auto service, and retail industries.

| Business Type              | Total      |
|----------------------------|------------|
| (blank)                    | 277        |
| Health Care                | 47         |
| Building Trade             | 45         |
| Garage/Car Services        | 27         |
| Store (Retail)             | 22         |
| Other                      | 19         |
| Emergency Response         | 17         |
| Restaurant                 | 16         |
| Maintenance                | 15         |
| Laboratory                 | 15         |
| Factory/Manufacturing/Mill | 14         |
| Cleaning Services          | 9          |
| Hotel                      | 9          |
| Child Care/Camp            | 8          |
| School                     | 6          |
| Hair Salon                 | 6          |
| <b>Grand Total</b>         | <b>552</b> |

### Discussion

Despite existing intervention and education efforts, reported occupational exposure rates have remained relatively steady since 2005 (an average of approximately 160 calls a year). In this study, the most common routes of exposure were from inhalation, dermal, and ocular and were most commonly ascribed to chemicals, cleaning substances, both household and industrial, fumes/gases/vapors, heavy metals, and hydrocarbons. These findings are the same as what we found in our analysis of 2005 to 2011 data.

The majority of calls to the NNEPC for exposures in the workplace were made by a healthcare provider or it was the patient themselves calling for information. Patients were more likely to be managed with an expert poison center staff consultation or at a health care facility. The majority of cases that were managed on site were not followed because serious health effects were unlikely. The majority of cases that were followed for patients that were already in, or en route to, a healthcare facility had minor to moderate injuries. These data suggest that perhaps many cases could have been managed on site without the need for emergency treatment.

The results of this study support the need for poison center data in occupational and public health surveillance efforts. NNEPC is the only New England surveillance system that provides near-real time

information on toxic exposures and their associated morbidities and mortalities. Exposure cases captured through poison centers reflect a significant burden of occupational injury that may not require extensive medical care (with nearly half of the cases not receiving care in a health care facility). Poison centers may also identify novel cases that are not reported through other hospital or clinic-based surveillance programs, or workplace injury and workers' compensation systems.

Though the NNEPC dataset is rich in clinical information about exposure circumstances, inclusion of more detailed demographic and employment data greatly enhances its public health utility. Understanding the business type of calls to the poison center allows us to better target prevention strategies.

## Limitations

The data used in this study included only those calls to the NNEPC, and therefore do not represent all workplace injuries and/or illnesses. The NNEPC is a passive surveillance system relying on self-reports. This results in several sources of information and reporting biases which may affect the quality of the data used for this analysis.

Incomplete and non-reporting of key variables such as industry and occupation reduce the ability to accurately describe the true distribution and burden of poisonings in various employment groups.

## Conclusion

The majority of exposures in the workplace are preventable as long as there are appropriate and targeted interventions. Successful approaches to making the workplace safer begin with having the most accurate and current occupational health surveillance data, which are necessary to understand the root causes of the problems that lead to occupational injury and illness. Unfortunately federal occupational health surveillance reporting requirements result in data gaps and shortfalls that do not accurately capture the true nature of work-related injuries and illnesses. This likely results in an inaccurate view that occupational injuries and illnesses are on a downward trend. More studies need to be done using non-traditional public health occupational surveillance data, such as poison center data, to better understand occupational injury risk factors and develop effective public health prevention strategies.

## Acknowledgements

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## About the New Hampshire Occupational Health Surveillance Project

The NH OHSP provides meaningful statistics to identify priority occupational safety and health issues in the state. This includes reports on a variety of core occupational health indicators based on measures of health (work-related disease, injury, or disability) or factors associated with health, such as workplace exposures, hazards or interventions.

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