ACUTE PESTICIDE-RELATED ILLNESS AND INJURY

Information for Providers in North Carolina

WHAT TO REPORT

Pesticides are widely used in both occupational and non-occupational settings. While they have many useful functions, they also have the potential to cause acute and chronic adverse health effects.

Pesticide exposure and related illness and injury represent a significant public health concern in North Carolina. Populations vulnerable to exposure include children and outdoor workers in the agricultural sector, such as pesticide applicators and migrant farmworkers.

The North Carolina Division of Public Health conducts surveillance of acute pesticide-related illness and injury cases, which are legally reportable in North Carolina.

North Carolina 10A NCAC 41F0101 - .0103 requires physicians to report any confirmed or suspected cases of acute pesticide-related illness and injury. Physician assistants, nurse practitioners, and other medical professionals are also encouraged to report.

Symptoms of acute pesticide-related illness or injury may include:
- respiratory
- gastrointestinal
- neurological
- and cardiovascular symptoms.

Acute injury may also present as:
- irritation of the skin or
- injury to the eye.

Severe cases may result in hospitalization or death.

HOW TO REPORT

- If a pesticide poisoning is suspected, call North Carolina Poison Control at 1-800-222-1222 or complete the reporting form to share information directly with NCDHHS — https://survey.dph.ncdhhs.gov/surveys/?s=A4JCN3ECEC
- Cases must be reported immediately if conditions result in death.
- Otherwise, reports should be made within 48 hours of diagnosis.
- Report patient information, product name, and EPA registration number, if possible.

Successful reporting ensures accurate, complete data on acute pesticide-related illness and injury in North Carolina. This data, in turn, is used to inform public health action and EPA risk assessments aimed at preventing pesticide poisonings, updating safety measures for handling pesticides, reducing health disparities, and protecting the health of those who live and work in our state.
Among occupational cases reporting their ethnicity, **21.2% described their ethnicity as Hispanic**. Comparatively, 10.2% of the general population of North Carolina identifies as Hispanic or Latino. This, in combination with results showing a relatively high proportion of cases work in agriculture (11.2%, N=116), suggests disproportionate incidence of acute pesticide poisoning among **farmworkers**, a population known to be vulnerable to pesticide exposure and related illness and injury. These statistics are likely underestimates, as underreporting is a known issue among this population due to barriers to care including cost, lack of insurance, transportation challenges, frequent relocation, and fear of loss of employment. Thus, pesticide-related illness and injury represents a significant **health equity issue** in our state.

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## Most acute pesticide-related illness and injury reports and cases for 2017-2021 were non-occupational (1212 of 1346 cases).

<table>
<thead>
<tr>
<th>What pesticides were used? (N=979)*</th>
<th>Insecticides (68.5%)</th>
<th>Herbicides/algicides (9.0%)</th>
<th>Insect repellent (8.3%)</th>
<th>Children &lt;12 years old accounted for 14.8% of non-occupational cases (N=1208). Children are particularly vulnerable to acute pesticide poisoning due to behavioral factors and a higher body burden of pesticide chemicals. Particular attention should be paid to pesticide use and storage in proximity to children.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where were they used? (N=630)</td>
<td>Applied to building surfaces or structures (45.1%)</td>
<td>Applied to skin and/or hair and clothing (14.6%)</td>
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<tr>
<td>How were they applied? (N=871)</td>
<td>Pressurized cans (31.1%)</td>
<td>Manual placement (21.4%)</td>
<td>Total release foggers or aerosol bombs (17.3%)</td>
<td></td>
</tr>
</tbody>
</table>

*Some individuals were exposed to more than one type of pesticide. Pesticide type was unknown for 269 (21.6%) pesticides associated with non-occupational cases.

## There were 129 occupational cases over the 2017-2021 period. Most of these cases occurred among adult males aged 20-69 (72.4%, N=97).

<table>
<thead>
<tr>
<th>What types of workers were most at risk? (N=107)</th>
<th>Building and grounds cleaning and maintenance (47.7%)</th>
<th>Farming, fishing, and forestry (11.2%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>What types of pesticides were involved? (N=116)</td>
<td>Insecticides (45.7%)</td>
<td>Herbicides/algicides (34.5%)</td>
</tr>
<tr>
<td>What factors contributed to exposure? (N=152)*</td>
<td>Inadequate PPE or PPE not being worn (28.3%)</td>
<td>Spilling or splashing of liquid or dust (17.8%)</td>
</tr>
</tbody>
</table>

*Some individuals had more than one contributing factor. Factors contributing to exposure were unknown for 31 (16.9%) occupational cases.
IMPACTS OF THE COVID-19 PANDEMIC

Surveillance data for 2017-2021 illustrated a decline in pesticide-related illness and injury reports in 2020 and 2021, which can likely be attributed to the COVID-19 pandemic. Case counts were approximately 33% lower in 2021 compared to 2017. This reveals a need for renewed reporting of reportable conditions such as acute pesticide-related illness and injury to pre-pandemic levels and suggests room for improvement in reporting during future public health emergencies.

INCREASING RATES OF DIAGNOSIS

Misdiagnosis is also common as acute pesticide-related illness and injury symptoms are often similar to those of other illnesses such as heat-related illness or green tobacco sickness. Promoting training among health care providers to improve diagnosis of environmental and occupational health issues may increase rates and accuracy of reporting.

ACTION ITEMS FOR PROVIDERS

• Report suspected pesticide poisonings to the North Carolina Poison Control at 1-800-222-1222, scan the QR code, or visit https://survey.dph.ncdhhs.gov/surveys/?s=A4JCN3ECEC to report.
• Ask patients with associated symptoms questions about chemicals used, especially during the late spring, summer, and early fall months
• Ask patients about occupation and industry to evaluate possible pesticide exposures
• Improve awareness and diagnosis of environmental and occupational health issues among healthcare professionals through training
• Inform patients or families that they can report suspected pesticide violations to the NC Department of Agriculture & Consumer Services, Structural Pest Control and Pesticide Division, (919) 733-3556.

For additional information, visit: https://epi.dph.ncdhhs.gov/oee/pest/surv.html

In case of a life threatening emergency, dial 9-1-1 immediately.