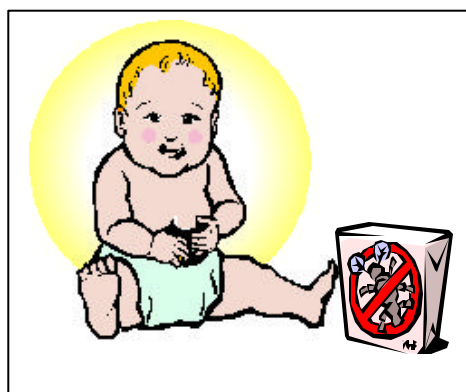


# New York State Pesticide Poisoning Registry Report 1998



**New York State Department of Health**

**New York State Department of Health**  
**Pesticide Poisoning Registry**  
**1998**

**New York State Department of Health**  
**Bureau of Occupational Health**

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# I. Pesticide Exposure and Symptoms

## Introduction

The New York State Pesticide Poisoning Registry (NYSPPR) was established in August 1990. This sentinel event surveillance program tracks acute health effects related to pesticide exposures. The goals of the program are to:

- investigate and intervene in any situation with a continued risk of pesticide poisoning
- develop and implement interventions that will reduce the risk of pesticide poisoning
- monitor the acute health effects of pesticide exposures
- increase the medical community's awareness about the possible adverse health effects from pesticide exposure

Pesticides are any substance or mixture of substances intended to control a variety of pests such as insects, rodents, fungi, weeds, microorganisms, and other unwanted organisms.<sup>1,2</sup> They are a heterogeneous group of chemicals that can include substances such as plant regulators, defoliants, desiccants and even disinfectants.<sup>1,2</sup> Pesticides are usually categorized by the type of pest they are intended to control. The most common categories are insecticides, fungicides, and herbicides. Other categories include rodenticides, termiticides, miticides, disinfectants, and insect repellents.<sup>1,2</sup>

The NYSPPR receives reports from physicians, health facilities and clinical laboratories, who are mandated to report under New York State law. In addition, the program tracks other reports received (pesticide incident reports and spurious reports). All reports received (except spurious reports) are classified using a national case classification system (Appendix A) and entered into a central database.

The NYSPPR is located in the New York State Department of Health (NYSDOH) Bureau of Occupational Health (BOH), in the Center for Environmental Health (CEH). This bureau conducts a number of public health programs aimed at tracking occupational disease and providing outreach and prevention activities. Staff from other NYSDOH CEH programs provide assistance as needed for site investigations (Bureau of Toxic Substance Assessment and Bureau of Environmental Exposure Investigation) and outreach activities (Education and Outreach Unit). The NYSPPR participates in the National Institute for Occupational Safety and Health (NIOSH) Sentinel Event Notification System for Occupational Risks (SENSOR) program.

This report summarizes case reports received in 1998 and the public health investigations and responses that resulted. In addition, other potential sources of information about pesticide poisonings such as hospital discharge data and poison control center data were explored to determine whether they could be utilized for increasing case ascertainment.

## **Pesticide Use in New York State**

The total amount of pesticides used in New York State in 1998 is unknown. However, the Pesticide Reporting Law (Chapter 279, Title 12) enacted in 1996 requires reporting of some pesticide use and sales. The New York State Department of Environmental Conservation (NYSDEC) maintains records of the: 1) amount of all pesticides applied by certified commercial applicators, 2) amount of restricted use pesticides sold to private applicators for use in agricultural crop production by commercial permittees (vendors), and 3) amount of restricted use pesticide sales by importers, manufacturers, and compounders to other commercial permit holders (distributors) for resale and end use by commercial applicators. NYSDEC does not receive reports on the quantities of pesticides sold for private use, such as by homeowners. NYSDEC identifies certain pesticides as restricted use pesticides because of their persistence in the environment, their bio-accumulative qualities, or the hazard they present to humans or other non-target life forms.

According to NYSDEC, in 1998 there was a total of 3,608,305 gallons and 23,551,785 pounds of restricted use and general use pesticide products applied by certified commercial applicators in New York State.<sup>3</sup> There are 15,674 individuals certified to apply restricted use and general use pesticides in NYS.<sup>3</sup> The number of people who work with these certified applicators, who are themselves not certified, is unknown. Exposure to pesticides can occur to the certified applicators, their employees and people working or residing in areas of applications.

In 1998, there were 395,838 gallons and 6,083,437 pounds of restricted use pesticides sold to distributors for resale and 173,265 gallons and 963,789 pounds sold for end use by commercial applicators.<sup>3</sup> The amount of pesticides sold may overestimate the amount of restricted use pesticides used since private applicators routinely return unused pesticides. Pesticide returns are not currently accounted for by NYSDEC, since it is not required by the Pesticide Reporting Law.<sup>3</sup>

In farming, both farmers and farm workers may be exposed as they apply pesticides, but exposure can also occur to seasonal laborers, family members, and neighbors. In 1998, there were approximately 38,000 farms in New York encompassing about 5 million acres of cropland.<sup>4</sup> There were approximately 11,000 private pesticide applicators<sup>3</sup>, who were mainly farmers who owned or rented land to produce an agricultural commodity. It was reported to NYSDEC that there were 915,725 gallons and 5,818,360 pounds of pesticides sold by commercial permittees to private applicators in New York State for agricultural use.<sup>3</sup>

These data provide some information on the self-reported amount of total pesticides applied or purchased by commercial applicators. However, this is an incomplete picture of total pesticide usage in agricultural settings since sales to farmers, distributors, and commercial applicators for end use are not necessarily equal to the amount of pesticides applied. Moreover, these data do not account for pesticide use by individuals in their own homes and gardens.

## Sources of Exposure

Exposure to pesticides can occur in a variety of settings including the home, workplace, and agriculture. Accidental spills or discharges can also result in exposure to pesticides. Exposure can occur by three major routes: skin contact (dermal), ingestion, and inhalation. Skin contact is the primary route of exposure for workers.<sup>1</sup> People involved in the manufacturing, packaging, mixing or application of pesticides, or working in areas where applications have occurred are at risk for occupational exposure. Individuals residing in or nearby places where pesticides have been applied can have non-work-related exposures.

Small children have potential for exposure from play and other behavior patterns.<sup>5,6</sup> They may become exposed through accidental spills and/or ingestion occurring in the home, residues on toys and in rugs where they crawl, playing with pesticide-treated pets, and outside activities in places where pesticides have been applied.<sup>7</sup>

## Health Effects of Pesticides

Many signs and symptoms of pesticide-related health effects are nonspecific. Some of these include headaches, nausea, dizziness and restlessness. However, various pesticides can also cause weakness, muscle twitching, profuse sweating, skin irritation and even convulsions. These signs and symptoms may vary in severity depending on the concentration, toxicity, route of exposure, and type of pesticide. Chemically similar pesticides generally affect the human body in the same manner but are dependent on the genetic make-up and overall health status of the individual. Children may have an increased sensitivity to pesticides due to their small body mass and because they differ physiologically from adults. For instance, in newborns, liver function has not reached its full potential; thus concentrations of enzymes needed to detoxify certain pesticides may be low.<sup>1</sup> Table I-1 summarizes some of the signs and symptoms of those pesticides most often implicated in acute poisonings.

Because of the diversity and nonspecific nature of symptoms that can be exhibited from exposure to pesticides, it is useful to try to confirm the exposure by either retrieving the chemical's container or by measuring the biological effect of the exposure. One way to ascertain the biological impact of certain insecticides (organophosphates and carbamates) is by measuring cholinesterase levels. Cholinesterase is an enzyme needed for the proper functioning of the nervous system. These insecticides can interfere with the actions of cholinesterase, by lowering cholinesterase levels. Depressed cholinesterase can cause acute symptoms ranging from weakness and nausea to paralyzed breathing and convulsions.

There are two types of cholinesterase tests generally used for identifying pesticide exposures – plasma cholinesterase and red blood cell cholinesterase. Plasma cholinesterase tests are helpful in detecting acute exposures, while red blood cell cholinesterase tests are used for evaluating chronic exposures.<sup>8</sup> The length of time that cholinesterase levels will remain depressed after exposure depends on the degree of exposure and whether it was from a carbamate or an organophosphate. For carbamate exposures, cholinesterase levels may return to pre-exposure levels after a period ranging from several hours to several days, while for organophosphates it may be depressed for several days to several weeks.

The types of pesticides that most commonly cause unintentional symptomatic poisoning according to national data from the Poison Control Centers' (PCCs) Toxic Exposure Surveillance System (TESS) are listed in rank order as follows: 1) anticoagulant rodenticides, 2) organophosphates, 3) pyrethrins and pyrethroids, 4) insect repellents, 5) carbamate insecticides, 6) organochlorine insecticides, 7) borates/boric acid, 8) chlorophenoxy herbicides, 9) naphthalene, and 10) diquat herbicides.<sup>9</sup>



**Table I-1. Signs and Symptoms of Pesticides Most Often Implicated in Acute Poisonings<sup>10</sup>**

<b>Pesticide Group</b>	<b>Signs and Symptoms<sup>a</sup></b>
<b>Insecticides</b>	
Organophosphates	<ul style="list-style-type: none"> <li>• <b><u>Mild</u></b></li> <li>• Headache</li> <li>• Fatigue</li> <li>• Dizziness</li> <li>• Muscle twitching</li> <li>• Excessive sweating</li> <li>• Excessive salivation</li> <li>• Loss of appetite</li> <li>• Nausea</li> <li>• Stomach cramps</li> <li>• Diarrhea</li> <li>• Blurred vision associated with excessive tearing</li> <li>• Contracted pupils of the eye</li> <li>• Slowed heart beat (&lt;50 beats per minute)</li> </ul>
	<p><b><u>Moderate to Severe</u></b></p> <ul style="list-style-type: none"> <li>• Inability to walk</li> <li>• Muscle twitching</li> <li>• Constricted pupils</li> <li>• Chest discomfort &amp; tightness (pulmonary edema)</li> <li>• Involuntary urination &amp; bowel movement</li> </ul>
	<p><b><u>Severe</u></b></p> <ul style="list-style-type: none"> <li>• Incontinence</li> <li>• Unconsciousness</li> <li>• Seizures</li> </ul>
Carbamates	Same as organophosphates, but tend to be of shorter duration
Pyrethrins and Pyrethroids	<p><b><u>Mild to Moderate</u></b></p> <ul style="list-style-type: none"> <li>• Allergic contact dermatitis</li> <li>• Allergic rhinitis</li> <li>• Skin irritation, i.e. stinging, burning, itching, and tingling progressing to numbness</li> <li>• Asthma &amp; sensitizing properties (pyrethrum)</li> </ul> <p><b><u>Moderate to Severe</u></b></p> <ul style="list-style-type: none"> <li>• Incoordination</li> <li>• Tremors</li> <li>• Salivation</li> <li>• Vomiting</li> <li>• Diarrhea</li> <li>• Irritability to sound and touch</li> <li>• Seizures</li> </ul>
Organochlorines	<p><b><u>Mild</u></b></p> <ul style="list-style-type: none"> <li>• Nausea</li> <li>• Vomiting</li> <li>• Dizziness</li> <li>• Headache</li> <li>• Disorientation</li> <li>• Muscle twitching</li> <li>• Weakness</li> <li>• Apprehension &amp; excitability</li> <li>• Tingling or prickling sensation on the skin</li> </ul> <p><b><u>Moderate to Severe</u></b></p> <ul style="list-style-type: none"> <li>• Loss of coordination</li> <li>• Unconsciousness</li> <li>• Convulsions similar to epileptic seizures</li> </ul>
<b>Herbicides</b>	
General	<p><b><u>Mild to Moderate</u></b></p> <ul style="list-style-type: none"> <li>• Dizziness</li> <li>• Headache</li> <li>• Diarrhea</li> <li>• Mental confusion</li> <li>• Muscular stiffness</li> <li>• Vomiting</li> <li>• Skin, eye and respiratory tract irritation</li> </ul>
Nitroaromatic compounds	<p><b><u>Mild to Severe</u></b></p> <ul style="list-style-type: none"> <li>• Headache</li> <li>• Fever</li> <li>• Dizziness</li> <li>• Restlessness</li> <li>• Convulsions</li> <li>• Excessive salivation</li> <li>• Excessive sweating</li> </ul>
<b>Rodenticides</b>	
Anticoagulants	<p><b><u>Mild to Moderate</u></b></p> <ul style="list-style-type: none"> <li>• Nosebleeds</li> <li>• Bleeding gums</li> <li>• Blood in urine</li> <li>• Anemia</li> <li>• Fatigue</li> <li>• Difficulty in breathing</li> </ul>

<sup>a</sup>These are only a few of the signs and symptoms experienced due to pesticide poisonings. For a more complete review of signs and symptoms for all types of pesticides, please refer to reference 10.

## **II. Surveillance of Pesticide-Related Health Incidents**

### **Introduction**

The number of pesticide-related acute health effects reported to the NYSPPR is expected to represent an underestimate of the true incidence of cases as their enumeration is highly dependent on: 1) associating nonspecific symptoms to pesticide exposure, 2) having a pesticide-related health complaint reported to an appropriate database, and 3) having evidence of exposure such as detection of a pesticide and/or its metabolite from a biologic media sampled from an individual, clothing residues, equipment, foliage residue, air, soil, or water.<sup>1,11</sup> NYSPPR utilizes the reports of pesticide-related health effects to conduct immediate interventions and to identify high-risk activities where outreach and future interventions can potentially prevent other pesticide-related health effects from occurring.

In 1998, two major changes occurred in the surveillance of pesticide-related acute health effects in New York State. The first was the adoption of a national case classification system designed to standardize data on pesticide-related health effects collected by different states. The use of this case classification system allows NYSDOH data to be directly comparable with other states. This data can be combined and evaluated in aggregate form. The second change was the adoption of a new software package, SENSOR Pesticide Incident Data Entry and Reporting (SPIDER), developed in-house specifically for the purpose of documenting information about pesticide-related acute health effects. SPIDER is currently being used by several other states participating in the national SENSOR pesticide program.

The new case classification system is based on three criteria: 1) the documentation of pesticide exposure, 2) the documentation of adverse health effects, and 3) evidence supporting a causal relationship between pesticide exposure and health effects.<sup>11</sup> Details of the case classification system are in Appendix A.

The national surveillance system (National Public Health Surveillance System) requires the reporting of cases that fall into the following categories: 1) definite, 2) probable, 3) possible, or 4) suspicious. Criteria have been set for other classification categories for states that choose to collect and track additional reports.

The SPIDER database is used for collection of all information necessary to classify the case, along with specific information regarding the chemicals of exposure. Examination of the data can assist in identification of potentially serious exposures in both communities and workplaces, thus allowing for the initiation of measures to help prevent illness.

### **Surveillance Activities**

The primary reporting sources for potential pesticide-related health effects are physicians, health facilities, and clinical laboratories. Reports received from secondary sources such as NYSDOH, NYSDEC, Local Health Units (LHUs) and PCCs are also investigated. New York State PCCs have agreed to notify NYSDOH of pesticide-related calls from physicians and health

facilities, calls that clearly involve a physician or health facility, and calls involving acute, potentially ongoing exposure situations or public health threats.

NYSDOH maintains a dedicated toll-free number that is staffed during regular business hours. During off-hours, an answering machine receives messages, asking the reporter to include details of the case involved, with a focus on obtaining information about the medical provider who will have custody of case records the next business day. Reports are sometimes received via fax as well.

In this report, the term “pesticide poisoning” refers to any acute health effect attributed to pesticide exposure, and does not necessarily refer to an overt poisoning. Upon receipt of a report of a potential pesticide poisoning, a NYSPPR staff member calls the reporting source for more information on the patient’s demographics (e.g., gender, date of birth), exposure (e.g., type of pesticide, circumstances of exposure) and symptoms experienced. Also, the patient is usually contacted directly for more extensive information regarding symptoms and exposure. In addition to obtaining information about the incident, the staff person provides prevention strategies, safety recommendations and educational materials, answers questions, and refers inquiries to appropriate NYSDOH personnel. If there appears to be an ongoing risk to the case, other workers or community members, staff will intervene in an effort to minimize or eliminate continued exposure. This might require air or environmental sampling to determine whether there is an ongoing risk for exposure. Data about pesticide incidents are then entered into the SPIDER database.

When deemed appropriate, patients may be referred to one of the eight occupational health clinics that comprise the NYS Occupational Health Clinic Network or to another qualified healthcare provider. The NYS Occupational Health Clinic Network helps prevent occupational disease by providing diagnostic services, medical screening, treatment, referral and educational services for workers exposed to toxic substances and other occupational hazards. While the focus of these clinics is occupational, some non-occupational illnesses are evaluated at these sites. The clinics are also actively engaged in case follow-up and industrial hygiene intervention. Appendix B contains the addresses and locations of clinics in the NYS Occupational Health Clinic Network.

## **New York State Pesticide Poisoning Registry**

A NYSPPR case must involve a suspected or confirmed pesticide poisoning involving a physician, health facility or clinical laboratory. Physicians, health facilities and clinical laboratories are mandated to report suspected or confirmed pesticide poisonings within 48 hours of diagnosis, under Part 22 of the New York State Sanitary Code (Appendix C). Clinical laboratories are specifically required to report abnormally depressed cholinesterase levels and abnormally elevated tissue levels of pesticides.

Potential cases reported by secondary sources are followed up by phone interview to determine if a physician, health facility or clinical laboratory was involved. If so, and it is determined that the case involved a suspected or confirmed pesticide poisoning, then that case is included in the NYSPPR.

**NYSPPR Reports**

In 1998, the NYSPPR received 107 reports of pesticide poisonings that required a full investigation and follow-up. The cases are described in Table II-1 by the case classification scheme and by intent (intentional or accidental). Intentional poisonings can include both suicide and homicide attempts.

**Table II-1. Case Classification of Pesticide Poisonings by Intent, NYS Pesticide Poisoning Registry, 1998**

Case Classification	Accidental		Intentional		Unknown		Total	
	N	%	N	%	N	%	N	%
Definite	23	23.7	8	100	0	0	31	29.0
Probable	21	21.7	0	0	0	0	21	19.6
Possible	10	10.3	0	0	0	0	10	9.3
Suspicious	10	10.3	0	0	1	50.0	11	10.3
Exposed, asymptomatic	2	2.1	0	0	0	0	2	1.9
Unlikely	1	1.0	0	0	0	0	1	0.9
Insufficient information	30	30.9	0	0	1	50.0	31	29.0
<b>Total</b>	<b>97</b>	<b>100</b>	<b>8</b>	<b>100</b>	<b>2</b>	<b>100</b>	<b>107</b>	<b>100</b>

Thirty of the accidental cases had insufficient information for classification because they lacked documentation of at least one of the three criteria used for classification. Many of these cases with insufficient information were lawn care workers with depressed cholinesterase levels, but without any other abnormal signs or symptoms. Since cholinesterase levels can vary greatly between individuals and between test laboratories, it is difficult to determine if these depressed levels were due to pesticide exposure. Repeat test results were not provided to the NYSPPR to verify if the low cholinesterase levels resulted from pesticide exposure or were normal baseline levels for the individual.

Classification of the accidental cases by occupational status is presented in Table II-2. A report was classified as occupational if an exposure occurred while at work. This includes not only those people working for compensation, including those working in a family business (e.g., family farm) or working for pay at home, but also those working as a volunteer, such as Emergency Medical Technicians and firefighters.<sup>11</sup> People working anywhere that pesticides are manufactured, mixed or applied would be considered occupationally exposed regardless of their job description. Other occupationally exposed people include workers who apply pesticides on farms, in greenhouses, and in residential and commercial settings. All other reports are classified as non-occupational.

**Table II-2. Case Classification of Accidental Pesticide Poisonings by Occupational Status <sup>a</sup>, NYS Pesticide Poisoning Registry, 1998**

Case Classification	Occupational		Non-Occupational		Total	
	N	%	N	%	N	%
Definite	8	19.1	15	30.6	23	25.3
Probable	4	9.5	16	32.7	20	22.0
Possible	5	11.9	5	10.2	10	11.0
Suspicious	4	9.5	6	12.2	10	11.0
Exposed, asymptomatic	2	4.8	0	0	2	2.2
Unlikely	0	0.0	1	2.0	1	1.1
Insufficient information	19	45.2	6	12.2	25	27.4
<b>Total</b>	<b>42</b>	<b>100</b>	<b>49</b>	<b>100</b>	<b>91</b>	<b>100</b>

<sup>a</sup>Information on occupational status was unknown for 6 accidental poisoning cases.

There was a difference between the percentage of occupational and non-occupational cases reportable to the national surveillance system. Approximately 85 percent of the non-occupational cases were reportable to the national surveillance system compared to 50 percent of the occupational cases. In fact, nearly 45 percent of occupational cases could not be classified due to insufficient information. In New York State, this group is mostly comprised of lawn care workers.

The following demographic and exposure information is presented only for accidental cases with definite, probable, possible and suspicious classifications. These are the case classifications reported to the national surveillance system and used for national comparisons.

### Demographic Information

Table II-3 displays the gender of cases by occupational status. Gender was not a factor in the occurrence of accidental cases, but it was a factor in whether or not cases were work-related. Two-thirds of work-related cases occurred among males. Significantly more females were non-occupationally exposed than occupationally exposed ( $\chi^2 = 9.3$ , p-value = 0.002).

**Table II-3. Gender of Nationally Reportable Accidental Pesticide Poisonings by Occupational Status <sup>a</sup>, NYS Pesticide Poisoning Registry, 1998**

Gender	Occupational		Non-Occupational		Total	
	N	%	N	%	N	%
Males	14	66.7	18	42.9	32	50.8
Females	7	33.3	24	57.1	31	49.2
<b>Total</b>	<b>21</b>	<b>100</b>	<b>42</b>	<b>100</b>	<b>63</b>	<b>100</b>

<sup>a</sup>Information on occupational status was unknown for 1 nationally reportable case.

Table II-4 displays the age distribution of accidental cases by occupational status. Occupational cases occurred among those within the typical age ranges (ages 20 to 49) of those

who work. About one-quarter of the non-occupational cases were among children (age less than 20), of which 40 percent occurred among those younger than 5 years old. As previously stated, children may have an increased sensitivity to pesticides.<sup>1</sup>

**Table II-4. Age in Years of Nationally Reportable Accidental Pesticide Poisonings by Occupational Status <sup>a</sup>, NYS Pesticide Poisoning Registry, 1998**

Age	Occupational		Non-Occupational		Total	
	N	%	N	%	N	%
< 5	0	0	4	9.5	<b>4</b>	<b>6.3</b>
5-12	0	0	3	7.1	<b>3</b>	<b>4.8</b>
13-19	0	0	3	7.1	<b>3</b>	<b>4.8</b>
20-29	8	38.1	3	7.1	<b>11</b>	<b>17.4</b>
30-39	5	23.8	12	28.7	<b>17</b>	<b>27.0</b>
40-49	6	28.6	5	11.9	<b>11</b>	<b>17.4</b>
50-59	2	9.5	6	14.4	<b>8</b>	<b>12.7</b>
60-69	0	0	3	7.1	<b>3</b>	<b>4.8</b>
70+	0	0	3	7.1	<b>3</b>	<b>4.8</b>
<b>Total</b>	<b>21</b>	<b>100</b>	<b>42</b>	<b>100</b>	<b>63</b>	<b>100</b>

<sup>a</sup>Information on occupational status was unknown for 1 nationally reportable case.

### Exposure Information

Accidental cases were categorized by type of pesticide in Table II-5. Individuals may have been exposed to more than one pesticide. Overall, the most common pesticide types reported to the NYSPPR involved exposure to cholinesterase-inhibiting insecticides and unspecified insecticides. Unspecified insecticides were more often the cause of occupational poisonings, whereas non-occupational poisonings were more often attributed to cholinesterase-inhibiting insecticides. In general, occupational cases were exposed more frequently to all other pesticide types, excluding cholinesterase-inhibiting insecticides, than non-work-related cases. This is because occupational cases were exposed more frequently to more than one pesticide type.

The locations in which pesticide exposures occurred are summarized by occupational status in Table II-6. Occupational exposures were relatively equally distributed among place of incident, whereas over 90 percent of non-occupational exposures occurred at home.

**Table II-5. Type of Pesticide<sup>a</sup> Involved in Nationally Reportable Accidental Poisonings by Occupational Status<sup>b</sup>, NYS Pesticide Poisoning Registry, 1998**

Type of Pesticide	Occupational		Non-Occupational		Total	
	N	% <sup>c</sup>	N	% <sup>c</sup>	N	% <sup>c</sup>
Insecticides, cholinesterase-inhibiting	7	33.3	22	53.4	<b>29</b>	<b>46.0</b>
Insecticides, noncholinesterase-inhibiting	3	14.3	0	0	<b>3</b>	<b>4.8</b>
Insecticides, unspecified	11	52.4	13	31.0	<b>24</b>	<b>38.1</b>
Pesticides, unspecified	3	14.3	5	11.9	<b>8</b>	<b>12.7</b>
Rodenticides	0	0	0	0	<b>0</b>	<b>0</b>
Algicides	0	0	1	2.4	<b>1</b>	<b>1.6</b>
Fungicides	1	4.8	2	4.8	<b>3</b>	<b>4.8</b>
Herbicides	3	14.3	4	9.5	<b>7</b>	<b>11.1</b>
Repellents	3	14.3	1	2.4	<b>4</b>	<b>6.3</b>
Disinfectants	1	4.8	2	4.8	<b>3</b>	<b>4.8</b>

<sup>a</sup>Cases could be exposed to more than one type of pesticide.

<sup>b</sup>Information on occupational status was unknown for 1 nationally reportable case.

<sup>c</sup>Denominator for percent is total number of reports in each category of occupational status (21 occupational, 42 non-occupational).

**Table II-6. Place of Incident of Nationally Reportable Accidental Poisonings by Occupational Status<sup>a</sup>, NYS Pesticide Poisoning Registry, 1998**

Place of Incident	Occupational		Non-Occupational		Total	
	N	%	N	%	N	%
Agricultural	4	19.1	1	2.4	<b>5</b>	<b>8.0</b>
Private Residence	2	9.5	39	92.8	<b>41</b>	<b>65.1</b>
Institutions	4	19.1	0	0	<b>4</b>	<b>6.3</b>
Manufacturing	2	9.5	0	0	<b>2</b>	<b>3.2</b>
Commercial	2	9.5	0	0	<b>2</b>	<b>3.2</b>
More than One Site	3	14.3	1	2.4	<b>4</b>	<b>6.3</b>
Other	3	14.3	1	2.4	<b>4</b>	<b>6.3</b>
Unknown	1	4.8	0	0	<b>1</b>	<b>1.6</b>
<b>Total</b>	<b>21</b>	<b>100</b>	<b>42</b>	<b>100</b>	<b>63</b>	<b>100</b>

<sup>a</sup>Information on occupational status was unknown for 1 nationally reportable case.

Symptoms associated with exposure to pesticides are shown in Table II-7. Eighty-six percent of the cases reported more than one symptom type with nearly a quarter reporting four or more symptom types. Neuromuscular symptoms were the most commonly reported type. Two-thirds of the cases reported gastrointestinal and approximately half reported respiratory symptoms. Only 10 percent of all accidental poisonings reported to the NYSPPR were hospitalized. The majority of these were non-occupational cases.

**Table II-7. Type of Symptom<sup>a</sup> (with Examples) for Nationally Reportable Accidental Poisonings by Occupational Status<sup>b</sup>, NYS Pesticide Poisoning Registry, 1998**

Symptom Type	Examples of Symptoms	Occupational		Non-Occupational		Total	
		N	% <sup>c</sup>	N	% <sup>c</sup>	N	% <sup>c</sup>
General	Fatigue, pallor, fever, lethargy, general discomfort	8	38.1	15	35.7	23	36.5
Dermal	Stinging, burning, itching, tingling, rash, hives, redness	5	23.8	11	26.2	16	25.4
Ocular	Blurred vision, excessive tearing, constricted pupils, pain, burning	7	33.3	11	26.2	18	28.6
Neuromuscular	Dizziness, disorientation, fainting, , slurred speech, headache, muscle spasms, paralysis, seizures, coma	11	52.4	32	76.2	43	68.3
Gastrointestinal	Vomiting, nausea, stomach pain, constipation, diarrhea, loss of appetite	6	28.6	27	64.3	33	52.4
Cardiovascular	Slowed or increased heart rate, chest pain, abnormal blood pressure, pulmonary edema	2	9.5	2	4.7	4	6.3
Renal	Blood and or protein in urine, scanty or excessive urination, renal failure	0	0	2	4.7	2	3.2
Respiratory	Wheezing, asthma, shortness of breath, nose/throat irritation, cough	10	47.6	25	59.5	35	55.6

<sup>a</sup>Many cases experienced more than one symptom type.

<sup>b</sup>Information on occupational status was unknown for 1 nationally reportable case.

<sup>c</sup>Denominator for percent is total number of reports in each category of occupational status (21 occupational, 42 non-occupational).

Table II-8 displays the route of pesticide exposure by occupational status. Forty percent of the individuals were exposed to a pesticide through more than one route. The majority of reports to the NYSPPR involved exposure through inhalation and approximately half involved dermal exposure. In fact, all but one case reported an inhalation or dermal exposure route. Less than 10 percent of all reports involved ocular exposures, which can occur by a pesticide splashing, spilling or spraying into the eye.

Table II-9 displays the primary ways individuals reported to the NYSPPR were exposed to pesticides (type of exposure) by occupational status. Indoor air exposure may occur through pesticide-contaminated air in residential, recreational, commercial, and/or occupational settings. Surface contact occurs when an individual is exposed through contact with a treated surface (e.g., plants, carpets, treated animal) or entry into an outdoor treated area. Direct contact exposure can occur via a spill, leaking container or equipment, flood waters, emergency response, etc. Cases may have been exposed through more than one type of exposure, although this comprised less than one quarter of the reports. Over 60 percent of all reported pesticide exposures occurred through indoor air contamination. All other exposure types occurred at a



relatively similar frequency among the non-occupational cases. Significantly more of the occupational cases had direct contact exposure than non-occupational cases ( $\chi^2 = 7.39$ , p-value = 0.006).

**Table II-8. Exposure Routes<sup>a</sup> of Nationally Reportable Accidental Poisonings by Occupational Status<sup>b</sup>, NYS Pesticide Poisoning Registry, 1998**

Route of Exposure	Occupational		Non-Occupational		Total	
	N	% <sup>c</sup>	N	% <sup>c</sup>	N	% <sup>c</sup>
Dermal	10	47.6	17	40.5	27	42.9
Ingestion	0	0	2	4.8	2	3.2
Inhalation	18	85.7	39	92.9	57	90.5
Injection	0	0	0	0	0	0
Ocular	2	9.5	2	4.8	4	6.3

<sup>a</sup>Many cases were exposed to a pesticide by more than one exposure route.

<sup>b</sup>Information on occupational status was unknown for 1 nationally reportable case.

<sup>c</sup>Denominator for percent is total number of reports in each category of occupational status (21 occupational, 42 non-occupational).

**Table II-9. Type of Exposure<sup>a</sup> of Nationally Reportable Accidental Poisoning by Occupational Status<sup>b</sup>, NYS Pesticide Poisoning Registry, 1998**

Types of Exposure	Occupational		Non-occupational		Total	
	N	% <sup>c</sup>	N	% <sup>c</sup>	N	% <sup>c</sup>
Drift	2	9.5	5	11.9	7	11.1
Spraying	5	23.8	6	14.3	11	17.5
Indoor air	12	57.1	28	66.7	40	63.5
Surface contact	1	4.8	5	11.9	6	9.5
Direct contact	11	52.4	8	19.0	19	30.2

<sup>a</sup>Many cases were exposed to a pesticide by more than one type of exposure.

<sup>b</sup>Information on occupational status was unknown for 1 nationally reportable case.

<sup>c</sup>Denominator for percent is total number of reports in each category of occupational status (21 occupational, 42 non-occupational).

## Pesticide Incident Reports

A pesticide incident report is any report of pesticide exposure that does not involve a suspicion or confirmation of pesticide poisoning by a physician, health facility, or clinical laboratory. Sources of pesticide incident reports include PCCs, NYSDOH, NYSDEC, LHUs, other agencies, and self-reports.

There were 17 pesticide incident reports received in 1998. Nine of these reports were made by a PCC, four by the individual or a relative, and two by the NYSDOH. Thirteen of the individuals did not seek any medical care and instead contacted a PCC for advice. PCC staff provide home treatment information in order to assist in avoiding costly hospital visits. If the

staff assess that further evaluation or treatment by a health care provider is necessary, they will refer the caller to the nearest health care facility. Of the four individuals who sought medical care, one was too young to state symptoms and had no physical signs of pesticide poisoning. In the other three cases, the physician did not attribute the signs and symptoms to pesticide exposure.

None of the 17 reports were work-related. All reported exposure at a private residence. Nine of the reports involved potential exposure to pesticides through the use of home lawn care products. Six of the reports involved potential exposure to pesticides from neighboring lawns via drift.

## **Spurious Reports**

A spurious report is a report that, upon review, does not involve any pesticide exposure. Seventy-four spurious reports were received in 1998. Approximately 90% of the spurious reports received were reports of depressed cholinesterase levels from laboratories. Laboratories are required to report depressed cholinesterase levels to the NYSPPR, however low levels are not always due to pesticide poisonings. Approximately three percent of the population has genetically determined low cholinesterase levels.<sup>10</sup> Several medical conditions can also result in depressed cholinesterase levels. Since baseline levels are often not available to know if this is a normal level for that individual, registry staff follow-up on these reports to determine if the depressed level is pesticide-related. If there is no evidence of a pesticide exposure, then the report is considered a spurious report.

At times, other agencies will inform the NYSPPR of pesticide incidents in which there is a potential for exposure. These cases are classified as spurious reports if, upon investigation, it is determined that no one has been exposed.

### III. External Data Review

Efforts were undertaken to determine whether existing health databases might assist with the identification and enumeration of pesticide-related acute health effects in NYS. Specifically, the two data sources examined were the NYSDOH hospital discharge data and the NYS PCC network data.

#### NYSDOH Hospital Discharge Data

The Bureau of Biometrics within the NYSDOH maintains a database of hospital inpatient information. This data system was established in 1979 to collect and maintain information on hospitalizations in a uniform manner for surveillance, regulatory and research purposes.<sup>12</sup> It should be noted that this data does not include those seen in emergency departments and not admitted to a hospital, nor does it include outpatient visits. Moreover, this data represents the number of hospitalizations, and therefore, the same individual may be represented more than once due to multiple admissions or transfers between hospitals. It should be noted that hospital discharge data is typically not available for several months after the event. Thus, immediate interpretation and investigation is difficult.

A pilot study was conducted to determine if the hospital inpatient data could be utilized to increase case ascertainment and enumeration. This information was used to identify hospitalized cases of pesticide poisonings through selected International Classification of Disease codes (ICD-9 codes) and external cause-of-injury codes (E-codes).<sup>13</sup> E-codes are used to supplement information coded with ICD-9 codes and provide information on the circumstances (e.g. cause, intent, place of occurrence) of the injury.<sup>14</sup> Since research has shown that E-codes are not always recorded in conjunction with ICD-9 codes<sup>15</sup>, both ICD-9 and E-codes were used to capture pesticide-related hospitalizations.

All diagnostic codes and E-codes were reviewed to ensure the hospital admission was truly a pesticide poisoning. Table III-1 displays the codes used to identify cases of pesticide poisonings and the number of hospitalizations identified with each code. Some individuals had more than one type of pesticide coded, resulting in 163 different pesticide codes. Those hospitalizations coded as a poisoning by an anticoagulant (n=233) with the ICD-9 code 964.2 were reviewed with their concurrently reported E-codes to determine if this code potentially represented a rodenticide pesticide poisoning. Anticoagulants are used medicinally in humans but can also be used as a rodenticide. None appeared to be related to rodenticide poisonings, and all were excluded from further analyses. Disinfectants were also excluded from analysis since ICD-9 codes and E-codes used to capture them also contain many other chemicals and chemical mixtures that would not commonly be used as disinfectants.

After exclusions, there were 122 pesticide-related hospitalizations in New York State in 1998 according to the hospital discharge database. It is expected that this does not represent the precise number of hospitalized pesticide poisonings due to errors in medical record coding. Furthermore, the identified hospitalized cases are not expected to represent the total number of pesticide poisonings in NYS because not all pesticide poisonings have symptoms severe enough to require hospitalization.

**Table III-1. ICD-9 Codes and E-codes Used to Identify Pesticide Poisonings, Hospital Discharges in NYS, 1998**

<b>Pesticide Type<sup>a</sup></b>	<b>ICD-9 code</b>	<b>N</b>	<b>E-code</b>	<b>N</b>	<b>Total N<sup>b</sup></b>
Insecticides, cholinesterase-Inhibiting	989.3	21	E863.1, E863.2	9	<b>21</b>
Insecticides, Noncholinesterase inhibiting	989.2	3	E863.0	2	<b>3</b>
Insecticides, unspecified	---	---	E863.4	20	<b>20</b>
Insecticide mixtures	---	---	E863.3	0	<b>0</b>
Pesticides, unspecified	989.4, 989.0	77	E863, E950.6	39	<b>87</b>
Pesticides, arsenic containing <sup>c</sup>	985.1	1	E950.8	9	<b>10</b>
Rodenticides	980.1	0	E863.7	17	<b>17</b>
Fungicides	---	---	E863.6	5	<b>5</b>
Fumigants	---	---	E863.8	0	<b>0</b>
Herbicides	---	---	E863.5	0	<b>0</b>

<sup>a</sup>Many hospitalizations involved more than one type of pesticide.

<sup>b</sup>Some hospitalizations were coded with both the ICD-9 code and the E-code.

<sup>c</sup>Hospitalizations may be from arsenic containing pesticides or other arsenic containing substances.

### Demographic Information

The intent of the poisoning (accidental or intentional) was based on the E-code classification. There are detailed E-codes for those instances where intent is unspecified or cannot be determined. For those pesticide poisonings with E-codes not specific to pesticide poisonings, the intent was determined from the non-pesticide poisoning E-code, where possible. Of the poisonings, fifty-seven hospitalizations were accidental exposures and 57 were intentional exposures. Except for two poisonings resulting from an assault with a pesticide, the rest of the intentional poisonings resulted from suicide attempts. There were eight poisonings where intent could not be determined.

Table III-2 displays the age of the hospitalized cases. Approximately one-third (32%) of all hospitalized accidental pesticide poisonings occurred in children younger than 12 years old, and almost all (86%) of the intentional poisonings were among adults 20 years or older.

Table III-3 displays the gender of the hospitalized cases. Approximately 60 percent of pesticide poisonings occurred among males, regardless of intent.

### Exposure Information

The most common pesticides reported for accidental poisonings in decreasing order were unspecified pesticides and insecticides, rodenticides, and organophosphate and carbamate insecticides (cholinesterase inhibitors). For intentional poisonings, over two-thirds were from unspecified pesticides and the remaining were from arsenicals and organophosphate and carbamate insecticides (data not shown).

**Table III-2. Age in Years of Pesticide Poisonings, by Intent, Hospital Discharges in NYS, 1998**

Age	Accidental		Intentional		Unknown		Total	
	N	%	N	%	N	%	N	%
£5	16	28.1	2	3.5	0	0	<b>18</b>	<b>14.8</b>
6-12	2	3.5	0	0	0	0	<b>2</b>	<b>1.6</b>
13-19	3	5.3	6	10.5	0	0	<b>9</b>	<b>7.3</b>
20-29	6	10.5	16	28.1	2	25.0	<b>24</b>	<b>19.7</b>
30-39	11	19.3	15	26.3	1	12.5	<b>27</b>	<b>22.1</b>
40-49	8	14.0	7	12.3	3	37.5	<b>18</b>	<b>14.8</b>
50-59	6	10.5	6	10.5	1	12.5	<b>13</b>	<b>10.7</b>
60-69	2	3.5	3	5.3	0	0	<b>5</b>	<b>4.1</b>
70+	3	5.3	2	3.5	1	12.5	<b>6</b>	<b>4.9</b>
<b>Total</b>	<b>57</b>	<b>100</b>	<b>57</b>	<b>100</b>	<b>8</b>	<b>100</b>	<b>122</b>	<b>100</b>

**Table III-3. Gender of Pesticide Poisonings, by Intent, Hospital Discharges in NYS, 1998**

Gender	Accidental		Intentional		Unknown		Total	
	N	%	N	%	N	%	N	%
Male	37	64.9	34	59.6	6	75.0	<b>77</b>	<b>63.1</b>
Female	20	35.1	23	40.4	2	25.0	<b>45</b>	<b>36.9</b>
<b>Total</b>	<b>57</b>	<b>100</b>	<b>57</b>	<b>100</b>	<b>8</b>	<b>100</b>	<b>122</b>	<b>100</b>

Over half of all hospitalizations for accidental pesticide poisonings and over one-third of those for intentional pesticide poisonings occurred at home, as displayed in Table III-4. The “place of incident” was not specified in about half of the intentional poisoning hospitalizations.

**Table III-4. Place of Incident of Pesticide Poisonings, by Intent, Hospital Discharges in NYS, 1998**

Place of Incident	Accidental		Intentional		Unknown		Total	
	N	%	N	%	N	%	N	%
Home	34	59.6	22	38.6	1	12.5	<b>57</b>	<b>46.8</b>
Industry	1	1.8	0	0	0	0	<b>1</b>	<b>0.8</b>
Farm	0	0	0	0	0	0	<b>0</b>	<b>0</b>
Residential institution	1	1.8	0	0	1	12.5	<b>2</b>	<b>1.6</b>
Other (beach, parking lot, street, forest, etc.)	10	17.5	5	8.8	0	0	<b>15</b>	<b>12.3</b>
Unspecified place	11	19.3	30	52.6	6	75.0	<b>47</b>	<b>38.5</b>
<b>Total</b>	<b>57</b>	<b>100</b>	<b>57</b>	<b>100</b>	<b>8</b>	<b>100</b>	<b>122</b>	<b>100</b>

## **New York State Poison Control Center Data**

In NYS, there are six designated regional PCCs, each assigned a specific, non-overlapping service area. Appendix D lists each PCC. The PCCs are responsible for providing education and information about poisonings to health care providers, toxicology interns, and the general public.<sup>16</sup> In addition, they perform the following services:

- Provide expert telephone consultation for emergency poison exposures and inquiries 24 hours per day, 7 days per week.
- Collect uniform data on poisonings and participate in nationwide sharing of data.

The PCCs provide phone consultation to health care professionals and the public and assess the risk of toxicity associated with poisoning emergencies. They often provide the public with home treatment information. By managing most emergency calls over the phone, they help avoid expensive trips to a health care facility. PCC staff will follow-up on the patients' status by calling them at home at regular intervals. If further evaluation or treatment is deemed necessary, the caller is referred to the nearest health facility. The PCC will inform the facility of the referral and arrange for emergency transportation if necessary.

The PCCs collect data according to a standardized format prescribed by the American Association of Poison Control Centers (AAPCC) Toxic Exposure Surveillance System (TESS).<sup>9</sup> Since 1991, all of the NYS PCCs have been submitting their data to this system, which enables uniform collection and comparison of data from PCCs across the nation.<sup>16</sup> Until the year 2000, each PCC in New York had its' own reporting format. Despite this, variables were uniformly coded between the PCCs to allow TESS to collect and abstract data.

PCCs may receive calls from a variety of sources, including the general public and health care providers. Neither the exposure nor the reported symptoms are necessarily confirmed and patients can easily be lost to follow-up. People can call a PCC repeatedly, which could result in an individual being counted more than once.

As a continuation of the pilot study examining sources of data that could be utilized for increasing case ascertainment and enumeration, data on acute human pesticide poisoning cases were obtained from TESS for the six NYS PCCs for 1998. The pesticide poisoning cases included exposure to fungicides, herbicides, insecticides, general pesticides, moth repellents, and rodenticides.

### **Demographic Information**

In 1998, PCCs received 586 calls from health care providers regarding individuals exposed to pesticides, of which 488 involved symptomatic cases, according to the TESS database. The PCCs classify individuals with symptoms into one of 11 categories, ranging from no effect to fatal outcomes. These classifications are based upon the type and severity of the symptoms and are described in Table III-5. The number of pesticide calls from health care providers received by each PCC is displayed by the classification category in Table III-6. Those

fitting into the category classified as “exposure not responsible for the effect” were not included, since technically these were not pesticide poisonings.

**Table III-5. Poison Control Center Definitions of Medical Outcomes**

<b>Medical Outcome</b>	<b>Definition</b>
<b>Case followed to known outcome</b>	
No effect	The patient developed no symptoms as a result of the exposure.
Minor effect	The patient exhibited some symptoms as a result of the exposure, but they were minimally bothersome to the patient. The symptoms usually resolve rapidly and usually involve skin or mucous membrane manifestations.
Moderate effect	The patient exhibited symptoms as a result of the exposure which are more pronounced, more prolonged or more of a systemic nature than minor symptoms.
Major effect	The patient has exhibited symptoms as a result of the exposure which were life-threatening or resulted in significant residual disability or disfigurement.
Death	The patient died as a result of the exposure or as a direct complication of the exposure where the complication was unlikely to have occurred had the toxic exposure not preceded the complication.
<b>Case not followed to a known outcome</b>	
Not followed, judged as nontoxic exposure	The patient was not followed because in the clinical judgement the exposure was likely to be nontoxic because: 1) the agent involved was nontoxic, 2) the amount implicated in the exposure was insignificant (nontoxic), and/or 3) the route of exposure was unlikely to result in a clinical effect
Not followed, minimal clinical effects possible	The patient was not followed because, in the clinical judgement, the exposure was likely to result in only minimal toxicity of a trivial nature.
Unable to follow, judged as a potentially toxic exposure	The patient was lost to follow-up and in the clinical judgement, the exposure was significant and may have resulted in toxic manifestations with a moderate, major or fatal outcome.
<b>Exposure not responsible for the effect</b>	
Unrelated effect	Based upon all the information available, the exposure was probably not responsible for the effect(s).
Confirmed nonexposure	There is reliable and objective evidence that the exposure never occurred and that any symptoms exhibited by the patient were not related to the reported exposure or any other toxic problem.
Death, indirect report	A reported fatality is coded as “indirect” if no inquiry was placed to the poison control center.

**Table III-6. Medical Outcome Classification of Pesticide Poisonings  
Reported by Health Care Providers to NYS PCCs, 1998**

	<b>New York City</b>	<b>Long Island</b>	<b>Hudson Valley</b>	<b>Finger Lakes</b>	<b>Central NY</b>	<b>Western NY</b>	<b>TOTAL</b>
No effect	6	11	25	8	17	3	<b>70</b>
Minor effect	29	13	16	11	13	10	<b>92</b>
Moderate effect	17	8	10	3	4	6	<b>48</b>
Major effect	7	1	2	0	0	2	<b>12</b>
Death	1	0	0	0	0	0	<b>1</b>
<b>Not Followed</b>							
Nontoxic	3	6	12	4	1	2	<b>28</b>
Minimal Clinical Effect	272	13	18	6	2	6	<b>317</b>
Potentially Toxic	10	2	4	0	1	1	<b>18</b>
<b>TOTAL</b>	<b>345</b>	<b>54</b>	<b>87</b>	<b>32</b>	<b>38</b>	<b>30</b>	<b>586</b>

Table III-7 displays the age distribution of the symptomatic pesticide poisoning cases reported to the PCCs by the medical outcome (cases classified as “no effect”, and “not followed, judged as nontoxic exposure” were eliminated). Those cases classified as “not followed, minimal clinical effect” were combined with those classified as “minor effects”, and those classified as “not followed, potentially toxic exposure” were combined with those classified as “major effect”. There were 12 individuals for whom specific age was unknown, but it was known that 2 were children (19 years of age or younger), and 10 were adults (20 years of age and older). Almost half the calls with minor or major health outcomes involved children; while, moderate health outcomes primarily involved people 20 to 50 years of age.

**Table III-7. Age in Years of Symptomatic Pesticide Poisonings  
Reported by Health Care Providers to NYS PCCs by Medical Outcome, 1998**

<b>Age</b>	<b>Minor</b>		<b>Moderate</b>		<b>Major</b>		<b>Death</b>		<b>Total</b>	
	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>
<5	217	53.1	3	6.2	10	33.3	0	0	<b>230</b>	<b>47.1</b>
5-12	25	6.1	4	8.3	1	3.3	0	0	<b>30</b>	<b>6.2</b>
13-19	13	3.2	3	6.2	0	0	0	0	<b>16</b>	<b>3.3</b>
20-29	28	6.9	7	14.6	4	13.3	0	0	<b>39</b>	<b>8.0</b>
30-39	45	11.0	16	33.3	3	10.0	1	100	<b>65</b>	<b>13.3</b>
40-49	27	6.6	8	16.7	6	20.0	0	0	<b>41</b>	<b>8.4</b>
50-59	28	6.8	5	10.4	1	3.3	0	0	<b>34</b>	<b>7.0</b>
60-69	9	2.2	2	4.3	0	0	0	0	<b>11</b>	<b>2.2</b>
70+	7	1.7	0	0	3	10.0	0	0	<b>10</b>	<b>2.1</b>
Unknown	10	2.4	0	0	2	6.7	0	0	<b>12</b>	<b>2.4</b>
<b>Total</b>	<b>409</b>	<b>100</b>	<b>48</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>1</b>	<b>100</b>	<b>488</b>	<b>100</b>



Table III-8 displays the gender of the symptomatic cases. One female with a minor medical outcome was pregnant at the time of exposure. There were more males in all medical outcome categories reported to the PCCs by health care providers.

**Table III-8. Gender of Symptomatic Pesticide Poisonings Reported by Health Care Providers to NYS PCCs by Medical Outcome, 1998**

Gender	Minor		Moderate		Major		Death		Total	
	N	%	N	%	N	%	N	%	N	%
Male	223	54.5	29	60.4	19	63.3	1	100	<b>272</b>	<b>55.7</b>
Female	185	45.0	19	39.6	11	36.7	0	0	<b>215</b>	<b>43.9</b>
Unknown	1	0.2	0	0	0	0	0	0	<b>1</b>	<b>0.2</b>
<b>Total</b>	<b>409</b>	<b>100</b>	<b>48</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>1</b>	<b>100</b>	<b>488</b>	<b>100</b>

### Exposure Information

Table III-9 displays the number of calls received for each type of pesticide. The majority of callers reported exposure to rodenticides and cholinesterase inhibiting (ChI) insecticides. Nearly three quarters (72%) of the rodenticide poisonings and most (84%) of the fumigant poisonings involved children under 5 years old. Over two-thirds (68%) of the herbicides involved adults 20-49 years of age.

**Table III-9. Type of Pesticide<sup>a</sup> Involved in Accidental Poisonings Reported by Health Care Providers to NYS PCCs, 1998**

Pesticide	Minor		Moderate		Major		Death		Total	
	N	% <sup>b</sup>	N	% <sup>b</sup>	N	% <sup>b</sup>	N	% <sup>b</sup>	N	% <sup>b</sup>
Herbicide	15	3.7	3	6.3	1	3.3	0	0	<b>19</b>	<b>3.9</b>
ChI insecticide	117	28.6	28	58.3	11	36.7	1	100	<b>157</b>	<b>32.2</b>
Non-ChI insecticide	15	3.7	0	0	3	10.0	0	0	<b>18</b>	<b>3.7</b>
Rodenticide	168	41.1	13	27.1	5	16.7	0	0	<b>186</b>	<b>38.1</b>
Fungicide	3	0.7	1	2.1	1	3.3	0	0	<b>5</b>	<b>1.0</b>
Fumigant	33	8.1	1	2.1	4	13.3	0	0	<b>38</b>	<b>7.8</b>
Other	20	4.9	0	0	0	0	0	0	<b>20</b>	<b>4.1</b>
Unspecified	40	9.8	3	6.3	6	20.0	0	0	<b>49</b>	<b>10.0</b>

<sup>a</sup>Callers could have more than one type of pesticide exposure.

<sup>b</sup>Denominators for percentages are total number of calls in each medical outcome category (409 minor, 48 moderate, 30 major, 1 death).

The site of exposure is documented in Table III-10 for the symptomatic cases. Most exposures were reported to have occurred within the home.

Table III-11 describes the type of symptoms experienced by the callers. Symptoms were not documented for 254 callers. The most common type of reported symptoms in the minor medical outcome category were gastrointestinal. The most common type of reported symptoms in the moderate medical outcome category were neurological. Neurological and gastrointestinal symptoms were the most common types of reported symptoms in the major medical outcome category, occurring at the same frequency.

**Table III-10. Site of Exposure of Symptomatic Pesticide Poisonings Reported by Health Care Providers to NYS PCCs by Medical Outcome, 1998**

Site	Minor		Moderate		Major		Death		Total	
	N	%	N	%	N	%	N	%	N	%
Home Residence	378	92.4	37	77.1	27	90.1	1	100	<b>443</b>	<b>90.8</b>
Other Residence	0	0	1	2.1	1	3.3	0	0	<b>2</b>	<b>0.4</b>
Workplace	18	4.4	8	16.6	0	0	0	0	<b>26</b>	<b>5.4</b>
Health Care Facility	4	1.0	0	0	1	3.3	0	0	<b>5</b>	<b>1.0</b>
School	2	0.5	0	0	0	0	0	0	<b>2</b>	<b>0.4</b>
Public Area	3	0.7	1	2.1	1	3.3	0	0	<b>5</b>	<b>1.0</b>
Other	2	0.5	0	0	0	0	0	0	<b>2</b>	<b>0.4</b>
Unknown	2	0.5	1	2.1	0	0.0	0	0	<b>3</b>	<b>0.6</b>
<b>Total</b>	<b>409</b>	<b>100</b>	<b>48</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>1</b>	<b>100</b>	<b>488</b>	<b>100</b>

**Table III-11. Type of Symptom<sup>a</sup> of Symptomatic Pesticide Poisonings Reported by Health Care Providers to NYS PCCs by Medical Outcome, 1998**

Symptom	Minor		Moderate		Major		Death		Total	
	N	% <sup>b</sup>	N	% <sup>b</sup>	N	% <sup>b</sup>	N	% <sup>b</sup>	N	% <sup>b</sup>
Cardiovascular	3	0.7	9	18.8	6	20.0	1	100	<b>19</b>	<b>3.9</b>
Dermal	20	4.9	2	4.2	2	6.7	0	0	<b>24</b>	<b>4.9</b>
Gastrointestinal	65	15.9	17	35.4	9	30.0	1	100	<b>92</b>	<b>18.9</b>
Hematological	5	1.2	1	2.1	6	20.0	0	0	<b>12</b>	<b>2.5</b>
Neurological	39	9.5	23	47.9	9	30.0	1	100	<b>72</b>	<b>14.8</b>
Ocular	34	8.3	11	22.9	7	23.3	0	0	<b>52</b>	<b>10.7</b>
Renal	1	0.2	1	2.1	0	0	0	0	<b>2</b>	<b>0.4</b>
Respiratory	21	5.1	13	27.1	4	13.3	1	100	<b>39</b>	<b>8.0</b>
Miscellaneous	23	5.6	8	16.7	5	16.7	1	100	<b>37</b>	<b>7.6</b>
Unknown	248	60.6	2	4.2	4	13.3	0	0	<b>254</b>	<b>52.0</b>

<sup>a</sup>Callers could have more than one symptom type.

<sup>b</sup>Denominators for percentages are total number of calls in each medical outcome category (409 minor, 48 moderate, 30 major, 1 death).

Table III-12 displays the route of exposure. Most of those with minor or major outcomes reported ingestion of the pesticide, while the majority of those with moderate outcomes reported exposure through inhalation.

**Table III-12. Route of Exposure<sup>a</sup> of Symptomatic Pesticide Poisonings  
Reported by Health Care Providers to NYS PCCs by Medical Outcome, 1998**

Site	Minor		Moderate		Major		Death		Total	
	N	% <sup>b</sup>	N	% <sup>b</sup>	N	% <sup>b</sup>	N	% <sup>b</sup>	N	% <sup>b</sup>
Ingestion	289	70.7	16	33.3	20	66.7	1	100	<b>326</b>	<b>66.8</b>
Inhalation	68	16.6	27	56.3	7	23.3	0	0	<b>102</b>	<b>20.9</b>
Ocular	31	7.6	4	8.3	2	6.7	0	0	<b>37</b>	<b>7.6</b>
Dermal	34	8.3	6	12.5	3	10.0	0	0	<b>43</b>	<b>8.8</b>
Parenteral	1	0.2	0	0	0	0	0	0	<b>1</b>	<b>0.2</b>
Unknown	4	1.0	2	4.2	0	0	0	0	<b>6</b>	<b>1.2</b>

<sup>a</sup>Callers can have more than one exposure route.

<sup>b</sup>Denominators for percentages are total number of calls in each medical outcome category (409 minor, 48 moderate, 30 major, 1 death).

## Recommendations on Future Use of External Data

Based on this pilot data review, some future uses of external data can be recommended. Evaluation of hospital discharge data is not a practical method for ongoing case ascertainment for purposes of acute public health intervention due to the lag time before this data is available for review. However, retrospective review of this data can be useful for identifying hospitals with reporting deficiencies. By reviewing hospital discharge data for ICD-9 codes relevant to pesticide poisonings and comparing these to reports received by the NYSPPR, hospitals failing to report suspected pesticide poisonings in accordance with reporting requirements can be identified. Hospitals found to be underreporting can be targeted for outreach activities to help improve reporting in the future. It is recommended that NYSPPR staff periodically review hospital discharge data for this purpose. If hospital discharge data can be obtained on a more regular and timely basis in the future then this data could be used for real-time case investigation and intervention.

The pilot review of the PCC data was useful in determining that there may be a number of potential cases reported to the PCCs that are not reported to the NYSPPR. However, there are inherent limitations in this data. Cases cannot be confirmed, and multiple reports may be included for the same individual. PCC reports do not necessarily represent poisonings, but may represent inquires made by health care providers about the effects of pesticide exposure. For these reasons and due to the volume of aggregate reports, this type of retrospective review of this data is not recommended in the future. However, based on the results of this pilot review, greater efforts will be made to encourage PCCs to share reports from or involving physicians or health facilities with the NYSPPR so that further case investigation can occur. PCCs will also be encouraged to report any cases potentially involving ongoing exposure or an acute public health threat. In addition, the possibility of implementing methods, such as computer software programs, for automatic reporting of specific types of cases from PCCs to NYSPPR will be explored. This might allow potential cases to be investigated on a real time basis with potential cases being reported to the NYSPPR as they are received by PCCs. This may result in a significant improvement in case ascertainment.

## **IV. Interventions and Outreach**

### **Introduction**

Reports to the NYSPPR must be received within 48 hours of diagnosis to allow timely interventions. NYSPPR staff coordinate these interventions, sometimes assisted by other NYSDOH staff, NYSDEC and LHUs. The focus of the NYSPPR is to assess the public health risk of a situation and assist in reducing or eliminating that risk.

Interventions are tailored to each situation and may consist of telephone interviews, distribution of educational materials, site investigations and referrals to other NYSDOH staff or other agencies as appropriate. Industrial hygienists within the NYSDOH BOH are available to assist with work-related exposure situations. Patients are offered a telephone consultation to discuss workplace health and safety practices and personal protective equipment in an effort to minimize or eliminate continued pesticide exposure. The industrial hygiene staff coordinate the interventions with the employer whenever appropriate, keeping the identity of the patient confidential if the patient so desires. Educational materials appropriate to the work activity are offered. NYSPPR staff may work with the employer or healthcare provider in establishing a bio-monitoring program, if necessary. Referrals may be made for medical follow-up at a NYSDOH Occupational Health Clinic Network site.

While always protecting the identity of the reported individuals, misapplications in any setting may be referred to NYSDEC for investigation or environmental sampling. Regional or district NYSDOH staff, or LHU staff may be contacted if a site investigation is necessary. Advice is given on prevention of future pesticide-related illness and may include distribution of educational materials, discussion of Integrated Pest Management (IPM) practices, or referral to other agencies for advice on safer pest control methods. Additional resources are recommended to healthcare providers, as appropriate (Appendix E).

### **Exposure Incidents and Interventions - Examples**

There were a number of different pesticide exposure scenarios reported to the NYSPPR in 1998, including events involving multiple individuals. The following sample cases demonstrate some of the pesticide incidents that occurred around the state in 1998 and the role of NYSDOH in the follow-up of reported cases. These represent just a sample of the varied exposure situations reported each year involving workplace, public and home settings.

- An incident involved secondary exposures and illness in emergency room staff treating a patient who had attempted suicide. A man drank between 4 and 10 oz. of Sevin concentrate, a carbamate pesticide, in an attempt to commit suicide. When he was taken to a hospital for treatment, several occupational poisonings occurred when members of the nursing staff became symptomatic to varying degrees. An emergency room nurse assisting in the insertion of a nasal gastric tube neglected to wear protective gloves. The patient vomited on her hands and pesticide residue was visible in the vomitus. The nurse was unable to wash for over 15 minutes and within 90 minutes became symptomatic. She was treated in the emergency room for dyspnea,

chest pain, coughing, headache, tingling in her hands, excess salivation and a metallic taste in her mouth. An ICU nurse, double-gloved and in protective eyewear while decontaminating the original patient, also became symptomatic. She reported eye and nose irritation, tingling hands and heavy arms. A third nurse, also in ICU, became symptomatic within 5 minutes of treating the original patient. She experienced eye burning and itching and facial irritation. The nurses requested health effects information from NYSDOH, as well as information on how to handle uniforms and other clothing they'd worn that night. NYSPPR staff also discussed health and workplace safety practices with the nurses.

- An event with exposure at home involved a man treating his own yard with an organophosphate pesticide. He allowed the product to get on his skin as he put his arms and hands into the granular formulation, apparently ignoring label warnings to avoid contact with skin, eyes or clothing. He became ill while working in the yard and contacted a PCC, which reported him to the NYSPPR. Registry staff provided advice on medical follow-up and safer pesticide use practices.
- A PCC reported a woman who became ill after her landlord applied outdoor pesticide concentrates indoors, in the heat ducts. Eventually the entire family was reported to the NYSPPR. As the extent of the problem became apparent, the investigation expanded to involve NYSDOH indoor air and regional staff, NYSDEC investigators, the county health department and social service agencies. The family was temporarily relocated and the landlord ordered to clean up the contamination. NYSDOH provided indoor air sampling and ventilation recommendations. Sampling revealed the continued presence of the pesticides in indoor air and the family permanently relocated. Both the county and NYSDEC charged the landlord with violations related to the illegal application of pesticides.
- A PCC reported a family who relocated to a hotel, due to concern about remaining in their Dursban TC-treated home. A termite application to the foundation had been performed earlier in the month. The family initially received information on environmental testing labs from the NYSDOH Environmental Helpline. They requested NYSDOH assistance for additional investigation of the application and resulting home contamination. NYSPPR staff contacted the county health department on their behalf. NYSDOH staff obtained the cooperation of the regional NYSDEC office for a joint investigation. Staff advised the family on the handling of toys exposed to the pesticide and referred them to a NYSDOH affiliated clinic for medical follow-up. NYSDOH Bureau of Toxic Substance Assessment (BTSA) toxicology staff provided health effects information to the family. BTSA staff made arrangements for analysis of air sampling results from the home to be conducted by the NYSDOH Wadsworth Laboratory. Sampling results revealed elevated levels of volatile organic compounds (VOCs) in the home and several aromatic hydrocarbons. The hydrocarbon pattern was a close match to that of other homes known to have Dursban TC contamination. The elevated VOCs may have been from the petroleum carrier of the pesticide. The recommendation was made that remediation of the

contamination in the home be conducted. (Note - In June 2000, the EPA announced a ban on most home and garden uses of Dursban due to concerns about health risks.)

- A woman used a bag of pesticide dust, labeled for outdoor use only, on her carpets after a store clerk told her it was appropriate for indoor use. She collapsed while vacuuming up the product and was taken to an emergency room. The landlord notified NYSDOH. This is not a typical reporting source so NYSPPR staff conducted reporting-related outreach with the hospital to educate them on the importance of prompt reporting of suspected poisonings. NYSPPR staff also contacted NYSDEC to obtain the product label and advised the patient on apartment cleanup and handling of foodstuffs. Toxicologists from BTSA worked with the patient to determine the extent of cleanup required to prevent continued adverse health effects. A NYSDOH district office staff person was sent to the home to help assess the success of remediation efforts.
- A physician reported a motorcyclist exposed to an aerial application while riding along a highway between onion fields. The cyclist was hit by spray from a small plane and 10 minutes later rode into a rainstorm, which may have caused the product to move through his clothing onto his skin. NYSPPR staff assisted the patient and physician in obtaining the correct product information from NYSDEC and the applicator. The NYSDOH provided the patient with the MSDS for the product and advised on decontamination. NYSPPR staff assisted the physician in choosing lab tests appropriate for the exposure.

## **Occupation-related Outreach Activities**

All reports of occupational exposures were investigated on an individual basis. Interviews with workers were conducted whenever the worker was receptive to the investigation. Employers were contacted when reported employees agreed to the contact or when employers could be contacted without revealing the identity of the reported individuals.

In 1998 NYSPPR staff examined the horticultural industry and the potential for exposure to gardeners, applicators and others entering those settings. Site visits were directed at greenhouses that varied in size, type of horticulture, methods and frequency of applications, types of pesticides used, number of applicators and overall mission (e.g. commercial sale, public display, education research). Despite the variations in types of facilities, staff observed numerous similarities in pesticide policies, work practices and potential health and safety hazards. These observations led to numerous recommendations related to cholinesterase screening, IPM implementation, personal protective equipment use, laundry and showering facilities, eye wash stations and proper work practices.

Health and safety information was sent to lawn care workers following in-depth telephone interviews. These workers also received cholinesterase-screening information, brochures on the NYSDOH Occupational Health Clinic Network, and washing machine magnets with laundering instructions for pesticide contaminated work clothing. Farm worker questions and concerns were referred to the agricultural nurse program.

Videotapes of IPM techniques and the accompanying training materials were sent to an agency trying to control pests around buildings and bridge projects where employees were working. Assistance was also given to an occupational medicine group providing cholinesterase screening for consultants visiting hazardous waste sites.

Brochures from the NYSDOH Occupational Health Clinic Network were distributed to all nine regional NYSDEC offices. Those offices oversee pesticide applicator training and offered the brochures to all individuals participating in training sessions over the winter months. The director of the NYSDOH Bureau of Occupational Health was a featured speaker to over 200 pesticide applicators seeking certification credits at a Cornell Cooperative Extension-sponsored training session. During this period, NYSPPR staff also met with NYSDEC management for discussions on both the newly implemented Worker Protection Standard (WPS) and NYSDOH greenhouse outreach activities as they related to the WPS. The meeting resulted in NYSPPR staff observing pesticide applicator recertification training in an agricultural setting that included worker protection training.

## **Reporting-related Outreach Activities**

The NYSPPR revised its brochure, working with the regional PCCs to include their contact information. These brochures, other program information, and general materials on pesticides were shared with several hundred physicians during the year. Registry staff also submitted an article to the New York chapter of the American College of Emergency Physicians for inclusion in their winter newsletter.

During this period, a physician from the NYSDOH Occupational Health Clinic Network presented a lecture on the diagnosis and management of pesticide poisonings and informed the medical audience of the reporting requirement in New York State. The event qualified physicians for continuing medical education (CME) credits and nurses for continuing education units (CEU).

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## APPENDIX A – NATIONAL CASE DEFINITIONS

### Case Definition for Acute Pesticide-Related Illness and Injury Cases Reportable to the National Public Health Surveillance System

#### *Clinical Description*

This surveillance case definition refers to any acute adverse health effect resulting from exposure to a pesticide product (defined under the Federal Insecticide Fungicide and Rodenticide Act (FIFRA) with the exception that disinfectants are excluded<sup>1</sup>) including health effects due to an unpleasant odor, injury from explosion of the product, and allergic reaction. Because public health agencies seek to limit all adverse effects from regulated pesticides, notification is needed even when the responsible ingredient is not the active ingredient.

A case is characterized by an acute onset of symptoms that are dependent on the formulation of the pesticide product and involve one or more of the following:

- Systemic signs or symptoms (including respiratory, gastrointestinal, allergic and neurological signs/symptoms)
- Dermatologic lesions
- Ocular lesions

This case definition and classification system is designed to be flexible permitting classification of pesticide-related illnesses from all classes of pesticides. Consensus case definitions for specific classes of chemicals may be developed in the future.

A case will be classified as occupational if exposure occurs while at work (this includes: working for compensation; working in a family business, including a family farm; working for pay at home; and, working as a volunteer Emergency Medical Technician (EMT), firefighter, or law enforcement officer). All other cases will be classified as non-occupational. All cases involving suicide or attempted suicide should be classified as non-occupational.

A case is reportable to the national surveillance system when there is (see the Classification Criteria section for a more detailed description of these criteria):

- Documentation of two or more new adverse health effects that are temporally-related to a documented pesticide exposure; AND
- Consistent evidence of a causal relationship between the pesticide and the health effects based on the known toxicology of the pesticide from commonly available toxicology texts, government publications, information supplied by the manufacturer, or two or more case series or positive epidemiologic investigations; OR
- Insufficient toxicologic information available to determine whether a causal relationship exists between the pesticide exposure and the health effects

#### *Laboratory criteria for diagnosis*

If available, the following laboratory data may confirm the diagnosis of acute pesticide-related illness or injury:

- Biological tests for the presence of, or toxic response to the pesticide and/or its metabolite (in blood, urine, etc.);
  - Measurement of the pesticide and/or its metabolite(s) in the biological specimen
  - Measurement of a biochemical response to the pesticide in a biological specimen (e.g. -2-cholinesterase levels)
- Environmental tests for the pesticide (e.g. foliage residue, analysis of suspect liquid);
- Pesticide detection on clothing or equipment used by the case subject.

## ***Classification Criteria***

Reports received and investigated by state programs are scored on the three criteria provided below. Scores are either 1, 2, 3, or 4, and are assigned based on all available evidence. The classification matrix follows the criteria section. The matrix provides the case classification categories and the criteria scores needed to place the case into a specific category. Definite, probable, possible and suspicious cases (see the classification matrix) are reportable to the national surveillance system. Additional classification categories are provided for states that choose to track reports that do not fit the criteria for national reporting. (Appendix 1 contains frequently asked questions (FAQs) that provide additional clarification on the classification criteria and use of the classification matrix. Appendix 2 lists the characteristic signs and symptoms for several pesticide active ingredients and classes of pesticides.)

### ***A. Documentation of Pesticide Exposure***

1. Laboratory, clinical or environmental evidence corroborate exposure (*at least one of the following must be satisfied to receive a score of "1"*):
  - a. analytical results from foliage residue, clothing residue, air, soil, water or biologic samples;
  - b. observation of residue and/or contamination (including damage to plant material from herbicides) by a trained professional  
[Note: a trained professional may be a plant pathologist, agricultural inspector, agricultural extension agent, industrial hygienist or any other licensed or academically trained specialist with expertise in plant pathology and/or environmental effects of pesticides. A licensed pesticide applicator not directly involved with the application may also be considered a trained professional.];
  - c. biologic evidence of exposure (e.g. response to administration of an antidote such as 2-PAM, Vitamin K1, or repeated doses of atropine);
  - d. documentation by a licensed health care professional of a characteristic eye injury or dermatologic effects at the site of direct exposure to a pesticide product known to produce such effects;
  - e. clinical description by a licensed health care professional of two or more post-exposure health effects (at least one of which is a sign) characteristic for the pesticide as provided in Appendix 2.
2. Evidence of exposure based solely upon written or verbal report (*at least one of the following must be satisfied to receive a score of "2"*):
  - a. report by case;
  - b. report by witness;
  - c. written records of application;
  - d. observation of residue and/or contamination (including damage to plant material from herbicides) by other than a trained professional;
  - e. other evidence suggesting that an exposure occurred.
3. Strong evidence that no pesticide exposure occurred.
4. Insufficient data.

### ***B. Documentation of Adverse Health Effect***

1. Two or more new post-exposure abnormal signs and/or test/laboratory findings reported by a licensed health care professional.
2. Two or more new post-exposure abnormal symptoms were reported. When new post-exposure signs and test/laboratory findings are insufficient to satisfy a B1 score, they can be used in lieu of symptoms toward satisfying a B2 score.
3. No new post-exposure abnormal signs, symptoms, or test/laboratory findings were reported.
4. Insufficient data (includes having only one new post-exposure abnormal sign, symptom, or test/laboratory finding).

### ***C. Evidence Supporting a Causal Relationship Between Pesticide Exposure and Health Effects***

1. Where the findings documented under the Health Effects criteria (criteria B) are:
  - a. characteristic for the pesticide as provided in Appendix 2, and the temporal relationship between exposure and health effects is plausible (the pesticide refers to the one classified under criteria A), and/or;
  - b. consistent with an exposure-health effect relationship based upon the known toxicology (i.e. exposure dose, symptoms and temporal relationship) of the putative agent (i.e. the agent classified under criteria A) from commonly available toxicology texts, government publications, information supplied by the manufacturer, or two or more case series or positive epidemiologic studies published in the peer-reviewed literature;
2. Evidence of exposure-health effect relationship is not present. This may be because the exposure dose was insufficient to produce the observed health effects. Alternatively, a temporal relationship does not

exist (i.e. health effects preceded the exposure, or occurred too long after exposure). Finally, it may be because the constellation of health effects are not consistent based upon the known toxicology of the putative agent from information in commonly available toxicology texts, government publications, information supplied by the manufacturer, or the peer-reviewed literature;

3. Definite evidence of non-pesticide causal agent;
4. Insufficient toxicologic information is available to determine causal relationship between exposure and health effects. (This includes circumstances where minimal human health effects data is available, or where there are less than two published case series or positive epidemiologic studies linking health effects to the particular pesticide product/ingredient or class of pesticides.)

CLASSIFICATION CATEGORIES <sup>1</sup>										
CLASSIFICATION CRITERIA	Definite Case	Probable Case		Possible Case	Suspicious Case	Unlikely Case	Insufficient Information		Not a Case	
		1	2				4	-	Asymptomatic <sup>2</sup>	Unrelated <sup>3</sup>
A. Exposure	1	1	2	2	1 or 2	1 or 2	4	-	-	3
B. Health Effects	1	2	1	2	1 or 2	1 or 2	-	4	3	-
C. Casual Relationship	1	1	1	1	4	2	-	-	-	3

<sup>1</sup> Only reports meeting case classifications of Definite, Probable, Possible and Suspicious are reportable to the National Public Health Surveillance system. Additional classification categories are provided for states that choose to track the reports that do not fit the national reporting criteria.

<sup>2</sup> The matrix does not indicate whether asymptomatic individuals were exposed to pesticides although some states may choose to track the level of evidence of exposure for asymptomatic individuals.

<sup>3</sup> Unrelated = Illness determined to be caused by a condition other than pesticide exposure, as indicated by a '3' in the evidence of 'Exposure' or 'Causal Relationship' classification criteria.

Pesticides are defined under the Federal Insecticide Fungicide and Rodenticide Act (FIFRA) as any substance or mixture of substances intended to prevent, destroy, repel or mitigate insects, rodents, nematodes, fungi, weeds, microorganisms, or any other form of life declared to be a pest by the Administrator of the US EPA and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant. Pesticides include herbicides, insecticides, rodenticides, fungicides, disinfectants, wood treatment products, growth regulators, insect repellents, etc.

Please note that adverse health effects resulting from exposure to disinfectant products are not reportable in many states because the volume of reports could overwhelm the state's surveillance system; therefore, these cases will not be routinely reported to the national surveillance system. Certain states may collect data on health effects resulting from a few selected disinfectants (e.g. glutaraldehyde). These may be reported to the national system as a special project if it is determined that a need exists.

Revised 01/31/00

## **APPENDIX B – NEW YORK STATE OCCUPATIONAL HEALTH CLINIC NETWORK**

The New York State Department of Health coordinates a statewide network of occupational health clinics. The clinics help prevent occupational disease by providing diagnostic services, medical screening, treatment, referral and educational services for workers exposed to toxic substances and other occupational hazards. An additional health center dealing primarily with agricultural health is located in Cooperstown.

### **Occupational Health Clinics**

#### **Albany/Mid-Hudson Valley**

Eastern New York Occupational and Environmental Health Center  
1873 Western Avenue  
Albany, NY 12203  
518-690-4420 or 800-419-1230

Satellite:  
Medical Center at New Paltz  
Westchester Specialty Services  
279 Main Street  
New Paltz, NY 12561

#### **Buffalo**

Union Occupational Health Center  
450 Grider Street  
Buffalo, New York 14215  
716-894-9366

#### **Cooperstown**

New York Center for Agricultural Medicine & Health  
One Atwell Road  
Cooperstown, New York 13326  
607-547-6023 or 800-343-7527

#### **Long Island**

Long Island Occupational and Environmental Health Center  
625 Belle Terre Road, Suite 207  
Port Jefferson, New York 11777  
(631) 642-9100

Satellite:  
Worker Wellness Center  
370 Motor Parkway  
Hauppauge, NY 11788

New York City/Mt. Sinai

Mount Sinai - I.J. Selikoff Center for Occupational and Environmental Medicine  
1 Gustave L. Levy Place, P.O. Box 1058  
New York, NY 10029  
212-987-6043

Satellites:

St. Johns Riverside Hospital  
967 North Broadway  
Yonkers, NY 10701

Mt. Sinai Hospital of Queens  
2715 30th Avenue  
Astoria, NY 11101  
718-278-2736

New York City/Health and Hospitals Corporation

Occupational and Environmental Medicine Clinic  
Bellevue Hospital  
1st Avenue and 27th Street, Room CD349  
New York, New York 10016  
212-562-4572

Rochester

Finger Lakes Occupational Health Services  
University of Rochester Medical Center  
2180 South Clinton Avenue, Suite D  
Rochester, New York 14618  
585-274-4554

Syracuse/Binghamton

Central New York Occupational Health Clinical Center  
6712 Brooklawn Parkway, Suite 204  
Syracuse, New York 13211  
315-432-8899

Satellite:

SUNY Binghamton  
School of Nursing  
Vestal, NY 13850

## APPENDIX C - STATE SANITARY CODE

### PART 22

#### ENVIRONMENTAL DISEASES

(Statutory authority: Public Health Law, §§ 225[5][t], 206[1][j])

**22.11 Reporting of pesticide poisoning.** Every physician, health facility and clinical laboratory in attendance on a person with confirmed or suspected pesticide poisoning or with any of the clinical laboratory results as described in section 22.12 of this Part, shall report such occurrence to the State Commissioner of Health within 48 hours. This report shall be on such forms or in such manner as prescribed by the State Commissioner of Health.

**Historical Note**

Sec. filed Aug. 14, 1990 eff. Aug. 29, 1990

**22.12 Reportable laboratory tests for pesticide poisoning.** For the purposes of section 22.11 of this Part the following laboratory tests are reportable to the State Commissioner of Health:

- (a) Blood cholinesterase levels which are below the normal range established by the clinical laboratory performing the test in accordance with quality assurance requirements established by the permit-issuing agency.
- (b) Levels of pesticides in human tissue samples which exceed the normal range established by the clinical laboratory performing the test in accordance with quality assurance requirements established by the permit-issuing agency.

**Historical Note**

Sec. filed Aug. 14, 1990 eff. Aug. 29, 1990

## **APPENDIX D – NEW YORK STATE POISON CONTROL CENTERS**

New York Regional Poison Control Centers  
CALL 1-800-222-1222

### Central New York

Central New York Regional Poison Control Center  
University Hospital  
Upstate Medical University  
SUNY Health Science Center  
750 East Adams Street  
Syracuse, NY 13210

### Finger Lakes

Finger Lakes Regional Poison and Drug Information Center  
Strong Memorial Hospital  
University of Rochester  
601 Elmwood Avenue, P.O. Box 321  
Rochester, NY 14642

### Hudson Valley

Hudson Valley Poison Education Center and  
The Center for Terrorism Education  
Phelps Memorial Hospital Center  
701 North Broadway  
Sleepy Hollow, NY 10591

### Long Island

Long Island Regional Poison and Drug Information Center  
Winthrop University Hospital  
107 Mineola Boulevard, 2<sup>nd</sup> Floor  
Mineola, NY 11501

### New York City

New York City Regional Poison Control Center  
New York City Department of Health  
455 First Avenue, Room 123  
New York, NY 10016

### Western New York

Western New York Regional Poison Center  
Children's Hospital of Buffalo  
219 Bryant Street  
Buffalo, NY 14222

**APPENDIX E – RECOMMENDED INFORMATION SOURCES FOR HEALTHCARE PROVIDERS**

EPA Handbook: Recognition and Management of Pesticide Poisonings. Available in electronic format on the internet: <http://www.epa.gov/oppfead1/safety/healthcare/handbook/handbook.htm> or by calling (703) 305-7666.

For information regarding acute occupational pesticide-related illness and injury, contact the National Institute for Occupational Safety and Health at 1-800-35-NIOSH.

For information about pesticides, acute pesticide-related illness and injury, and the toxicology and environmental chemistry of pesticides, contact the National Pesticide Information Center (NPIC) at 1-800-858-7378.

ATSDR Case Studies in Environmental Medicine is a series of publications intended to increase knowledge of hazardous substances and to aid in the evaluation of potentially exposed patients. They are available on many topics including Cholinesterase-Inhibiting Pesticide Toxicity, Chlordane Toxicity, and Taking an Exposure History. Copies can be obtained by calling the NYS Center for Environmental Health Helpline at 1-800-458-1158.

Pesticide product labels are available at <http://www.epa.gov/pesticides/pestlabels>

Pesticide Information Profiles are available at <http://ace.ace.orst.edu/info/extoxnet/pips/ghindex.html>

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Information on the West Nile Virus can be found on the NYSDOH website: <http://www.health.state.ny.us/nysdoh/westnile/index.htm>