

New York State Pesticide Poisoning Registry

Ten Year Summary : 1998 - 2007

New York State Department of Health
Center for Environmental Health
Bureau of Occupational health
547 River Street
Troy, New York 12180

June, 2009

Table of Contents

Concise Summary	i
Acknowledgments	ii
The Pesticide Poisoning Registry	2
Poisoning Status.....	2
Occupational Status	2
Location of Exposure	2
Product Type.....	2
Product Chemical Class	3
What the Pesticide Poisoning Registry Does	3
Surveillance.....	3
Follow-up	3
Outreach.....	3
Reporting.....	4
Case Reports	5
Children & Pesticides	5
Unlicensed Applicators	5
Illegal Pesticides	6
Changing Containers	6
Accidents	6
Labels Contain Important Information	6
Unanticipated Side Effects	7
Other Hazards	7
Statistical Summary - 1998 to 2007	8
Poisoning Status.....	8
Occupational Status	8
Age	8
Location of Exposure	9
Product Type.....	10
Product Chemical Class	11
Surveillance and Follow-up Activities	12
Surveillance.....	12
Follow-up & Referral.....	13
General Information	15
What is a pesticide?	15
Integrated Pest Management (IPM)	15
Buying and Using Pesticides	17
Appendices	18
A. Regulatory Authority	18
B. Case Definition and Status Definition	20
C. List of Abbreviations	24

Concise Summary

Pesticides continue to be a cause of poisoning. During the ten year period covered by this report, well over 1400 persons were reported to the Pesticide Poisoning Registry (PPR), suspected victims of pesticide poisoning. Approximately half of these people were exposed in their own homes. Many other exposures occurred in settings where pesticide exposure would not normally be considered likely, e.g. office spaces, retail stores, schools, parks and golf courses.

Two thirds of these suspect poisonings involved insecticides. The active ingredients chosen to kill insect or animal pests are similarly toxic to people. Herbicides and fungicides are usually less toxic to people than their intended target organism. This is a generalization, of course; herbicide and fungicide exposures have also triggered some of the PPR reports.

The root cause for most of these poisonings is failure to read and follow label directions. This results in applying too much product, the wrong product, or applying under the wrong conditions. In the case of total release foggers, fires and explosions have resulted when label directions were not followed precisely. In several cases, label directions could not be followed because the product had been poured into a new, unlabeled container. This not only makes safe application impossible, it has also caused several poisonings when people have mistakenly swallowed a pesticide product.

Some of the reports were the result of accidental spills, often involving containers that had been in storage for a long time, or accidental exposures because the wind was blowing.

In the year 2000, one pesticide product line was recalled by the EPA due to an unexpectedly strong tendency to trigger allergic and asthmatic response in users, even when directions were followed. Curiously this product was designed to eliminate asthma and allergic reactions to household dust mites. The recall of this product was initiated by reports from state pesticide poisoning registries, and highlights the importance of reporting pesticide poisonings to public health agencies.

Acknowledgments

This report represents the efforts of many people in the Bureau of Occupational Health. Without the help of data entry staff, investigators and clerical staff, the data simply would not be available.

Poison control centers are not required to report pesticide poisonings. (See appendix A.) However, all poison control centers in New York have voluntarily contributed cases to the registry. The New York City Poison Control Center has provided a substantial amount of data from their computer system. Dr. Robert Hoffman's efforts in enabling access to that data is appreciated. It would not reach the Pesticide Poisoning Registry, however, without the work of Caroline Bragdon and Daniel Kass of the New York City Department of Health and Mental Hygiene.

The Pesticide Poisoning Registry

The Pesticide Poisoning Registry (PPR) collects information on events which have resulted in people being harmed as the result of pesticide use. The events are illustrative of the risks of pesticide products. They highlight not only the risks of pesticides due to their toxic nature, but also the potential for harm due to misuse.

In order to convey a general appreciation of the situations resulting in pesticide poisonings, we have characterized the data in a number of useful ways.

Poisoning Status

As staff investigates poisoning reports, they apply a set of evidence-based rules to determine the degree of certainty that can be attached to a poisoning report. A poisoning diagnosed by a physician or other licensed health care professional, with symptoms that corresponds to the scientific literature, for which there is strong factual evidence of exposure, and for which the symptoms occur in the expected time frame, would be characterized as a "Definite" poisoning. (See page 8.)

One of the difficulties of investigating pesticide poisonings is the similarity of some symptoms of poisoning to other illnesses that may be present. Headache and nausea are also symptoms of the flu and food poisoning. If these symptoms are present before the exposure, it becomes more difficult to attribute them to the pesticide event with full assurance. Other categories include "Probable", "Possible" and "Unlikely". (See page 8.)

Occupational Status

The registry also attempts to determine if poisonings are work related. Persons working as applicators should be provided suitable training and protective equipment by their employers, as required by the EPA, and should be preventable. In addition, workers, who often handle or apply pesticides more frequently, in larger amounts and of higher toxicity, may be among the first to experience unanticipated effects of exposure. They may be 'sentinel cases' alerting us to look more closely at a specific product or ingredient. (See page 8.) However, there are also workplace exposures in office settings.

Location of Exposure

People have been inadvertently exposed to pesticides everywhere pesticides are used or stored. This includes expected locations such as farms and homes, but also retail stores and office spaces. In addition, pesticide residues may be found in unanticipated locations that you might not readily think of; chemicals used by lawn care services are also used on golf courses, and along rail and utility rights-of-way to control weed growth. (See page 9.)

Product Type

Pesticide products are commonly referred to as insecticides, rodenticides, herbicides and fungicides, just to name four of over 50 types. These names reflect the intended use of the product and are

designed to help the customer find the right product for the right pest. However, a product designed to treat one type of pest, such as herbicides for plants or weeds, may also be harmful to other pests, pets or people. (See page 10.)

Product Chemical Class

Chemical classes are the most complicated way of characterizing pesticides, but most closely related to the way the pesticide works at the biological level. Typically, pesticide ingredients in the same chemical class will cause very similar sets of symptoms if a poisoning occurs. Doctors will often use these sets of symptoms to help diagnose and treat pesticide poisonings. (See page 11.)

What the Pesticide Poisoning Registry Does

The Pesticide Poisoning Registry (PPR) conducts activities in four broad areas: Surveillance, Follow-up, Outreach and Reporting.

Surveillance

Surveillance is the ongoing, systematic collection, analysis, and interpretation of health data for purposes of improving health and safety. In essence, you have to collect data in order to discover the root problems that cause pesticide poisoning. In New York State, hospitals, physicians and clinical laboratories are required by law to report suspected pesticide poisonings. Physicians and hospitals report individual cases, while clinical laboratories report the results of tests on blood or tissue samples that may indicate pesticide exposure. In addition, Poison Control Centers may also report pesticide incidents.

These data are considered individual health records and are only used for public health purposes. Individual data are not released to the public.

Follow-up

When a report is received, PPR staff attempt to interview the affected person, or an adult family member if the affected person is a minor. The interview provides a way to obtain information about the event which resulted in the suspected poisoning and identify other individuals which may be affected. It is also an opportunity to provide the individual with additional information on alternative products that are less hazardous, or IPM alternatives. Where appropriate, we may advise the individual how to address issues of misapplication by a licensed applicator.

The PPR also relies on industrial hygiene staff to advise individuals and employers on selection and use of appropriate protective equipment.

Outreach

Each year, PPR staff renews their contacts with facilities, programs and individuals that are likely to encounter pesticide poisonings, such as medical societies, nurses associations, hospital emergency rooms, agricultural medical centers, and farm worker programs.

Reporting

Since cases of pesticide exposure may indicate an on-going event, some reporting occurs immediately. This type of report is typically made to county or district health departments as part of their public health duties. Most reporting is done on an annual basis, and includes reports such as this one, as well as submission of summary data to federal agencies, such as the Environmental Protection Agency (EPA) and the National Institute for Occupational Safety and Health (NIOSH). Summary data never contains information that would identify individuals.

Case Reports

Children & Pesticides

There are a surprising number of children reported to the Registry. When pesticides are not stored or applied in appropriate ways, children gain access to them. Children are very curious and can easily go places adults cannot, as these two cases demonstrate.

Case 1

A seven year old child climbed and retrieved 'air freshener' from a high shelf. She closed her bedroom door and began spraying her room. Her mother heard a peculiar noise and went to the child's room to find her struggling for breath. The child was taken to the emergency room where she was decontaminated. The air freshener was really a can of spray insecticide.

Case 2

A child was found with rat bait pellets in his mouth. The child was taken to the emergency room. As a precautionary measure, blood samples were drawn and tested to see if the child had eaten sufficient amount of the bait to affect blood clotting. The bait had been placed behind a sofa.

Unlicensed Applicators

While over-the-counter (OTC) products can be purchased for personal use, they generally must be applied by a licensed applicator if applied in a business location or for someone else.

Case 3

A family hired a friend who ran a small pest control business to treat their home for crickets while the home was undergoing extensive renovation. When he finished, there was visible residue on kitchen counters and on dishware. Shortly thereafter, members of the family began feeling ill. The county health department was called. Samples indicated the presence of the pesticide in the kitchen, child's bedroom and basement. Numerous violations were found, including the fact that the friend was not a certified applicator, had not registered his pesticide business, and had used a strong outdoor pesticide indoors.

Case 4

Hotel staff became ill while cleaning a room recently vacated by guests with pets. Other staff had released a 'flea bomb' in the room 45 minutes prior, and had not posted a notice on the door. This person was not a certified applicator, as required. The room required decontamination.

Case 5

A school librarian brought some aerosol insect spray to work to treat roaches. Others became ill when entering the library. Extensive cleanup was required and fines were levied for illegal application.

Illegal Pesticides

Highly toxic pesticides are not sold to the general public. These 'restricted use' products are only sold for use by trained and licensed applicators. Occasionally, the Registry receives reports of poisonings that resulted from persons who were able to purchase one of these products from an individual selling pesticides on a street corner.

Case 6

A six year old child was rushed to the emergency room after eating a piece of cake baited with *tres pasitos* to kill rats. The child was transferred to a second hospital for treatment. *Tres pasitos*, Spanish for three little steps, is the street name for aldicarb, a highly toxic pesticide that kills rodents before they can take 'three little steps'. Its use as an insecticide requires a license in New York. It is not licensed for rodent control. The *tres pasitos* was obtained from the Dominican Republic.

Changing Containers

If you pour a pesticide into a new container, the next person will have no idea what is in it. If it has the original label, and not a pesticide label, problems result!

Case 7

A woman used a bottle of what she believed was vinegar on her salad for 5 nights. On the fifth night she awoke feeling ill. Her husband had mixed pesticides in the bottle and had left it on the counter.

Case 8

Two years earlier, a man poured a pesticide into a sports drink bottle because the original container was rusting. He then took the bottle with him to his Florida vacation home, where it was placed on a shelf in the garage. The label fell off, and someone moved the bottle to a refrigerator. It was later packed in a cooler and brought back home and placed in the refrigerator there. While working hard outdoors, the man took a drink from the bottle believing it to be juice. He spent several days in the intensive care unit.

Accidents

Case 9

A man, his two sons and a friend were cleaning the basement of a home after a death in the family. A one quart bottle of Malathion was knocked to the floor and broke. While attempting to clean up the spill, all the men became ill and 911 was called. All were taken to the emergency room for treatment and decontamination; two of the ambulance attendants also had to be treated in the emergency room.

Labels Contain Important Information

Case 10

An apartment dweller purchased a four pound bag of Sevin dust and spread the entire bag on her carpet. She tried to use a vacuum to remove the powder, and found that much of the powder spread to other surfaces. She became ill while vacuuming, and was taken to the emergency room for treatment and decontamination. The store employee had recommended an outdoor product for use

indoors, contrary to the label, and in an amount far exceeding any possible requirement. The store provided extensive cleaning of the apartment; new carpet and mattresses had to be obtained.

Case 11

A man was spraying for bees and hornets on his deck. He developed symptoms within 2 hours and was rushed to the emergency room an hour later. He had been spraying overhead and had a substantial amount of liquid fall back on to his clothing and face. The label stated that the user should "stand a safe distance from the nest with wind at your back, and not directly underneath".

Unanticipated Side Effects

Some products turn out to have side effects that strongly affect a small percentage of people, and this possibility is not discovered until a product becomes widely used.

Case 12

In 1999, seven people were reported to the PPR due to a severe reaction to a new product designed to kill dust mites. Dust mites can be a significant of 'hay-fever' allergic reactions and is also an asthma trigger. Turns out the product could trigger asthma attacks all on its own. These reports, and similar reports from other states with pesticide poisoning registries, triggered an EPA review of the product. In 2000, the product was recalled by the manufacturer.

Other Hazards

Sometimes, pesticides have properties other than the toxicity of the ingredients that make them dangerous.

Case 13

A 'roach bomb' was triggered in the kitchen of an apartment. A small explosion and fire resulted when the fumes were ignited by the pilot light of the nearby stove. A fireman responding to the fire entered the kitchen, but had to retreat to don turnout gear. Both the kitchen and the fireman had to be decontaminated.

Statistical Summary - 1998 to 2007

Poisoning Status

Status	Female	Male	Total
Definite	104	88	192
Probable	140	110	250
Possible	180	145	325
Suspicious	111	139	250
Unlikely	23	16	39
Insufficient Information	113	169	282
Exposed, Not Poisoned	55	76	131
Unrelated to pesticides	4	7	11
	730 (49%)	750 (51%)	1480

The criteria for classifying poisoning status are quite rigorous; the registry considers any person in categories 'Definite' to 'Suspicious' (rows above the dotted line) as likely to have been be poisoned. These categories comprise 68% of reports. Reports whose status is below the dotted line represent incidents where a pesticide was reported to be involved, but further investigation discovered that reported symptoms were the result of other substances, pre-existing medical conditions, or insufficient information to clearly attribute the outcome to a pesticide. All of the following tables use only the cases above the dotted line. The full definition of these status categories can be found in Appendix B.

Occupational Status

Occupational?	Female	Male	Total	%
Yes	90 (17%)	139 (29%)	229	23%
No, or Unknown	445 (83%)	343 (71%)	788	77%
	535 (53%)	482 (47%)	1017	

For both men and women, most poisonings are not work-related. While there are almost the same number of men and women in the pesticide registry, men are somewhat more likely to be poisoned at work as elsewhere.

Age

Age Groups	Female	Male	Total	%
<5	49	46	95	9%
5 - 9	35	26	61	6%
10 - 19	52	34	86	8%
20 - 29	56	59	115	11%
30 - 39	88	94	182	18%
40 - 49	109	99	208	20%
50 - 59	79	70	149	15%

60 – 69	35	31	66	6%
70+	32	23	55	5%
Total	535	482	1017	

Children represent about 20% of reports. There are several reasons for this. Younger children that have not yet learned to read are unaware that they are handling a toxic substance. As in case report #2, they may act out adult behaviors using a pesticide that would be appropriate for another product. Children are often able to reach pesticide products that adults believe have been placed out of their reach. Rodent baits ‘hidden’ behind or under furniture are the basis of many child reports.

Location of Exposure

Location Type	Occupational		Total	%
	Yes	No		
Private Residence	21	645	667	65%
Office/Business	43	1	44	4%
Service Establishment	27	17	44	4%
Park	2	38	40	4%
More than one site of exposure	20	2	22	3%
Farm	18	4	22	2%
School	7	12	19	2%
Retail Establishment	8	6	14	1%
Pesticide Mfg/Form Facility	14	0	14	1%
Road, Rail, Util. Right-of-Way	5	9	14	1%
Other	8	4	12	1%
Other Institution	8	1	9	1%
Golf Course	6	2	8	1%
Hospital	6	1	7	1%
Industrial Facility	6	0	6	1%
Nursery (tree/shrub)	4	1	5	0%
Residential Institution	5	0	5	0%
Private vehicle	0	5	5	0%
Greenhouse	3	0	3	0%
Other Manufacturing	2	0	2	0%
Prison	2	0	2	0%
Public transportation	1	0	1	0%
Day care facility	1	0	1	0%
Unknown	10	34	44	0%
	229	788	1017	
	23%	77%		100%

Most of the pesticide poisonings (77%) are non-occupational, and of these, over 80% occur in the home. This is not unexpected; professional applicators are trained to use pesticides, what protective measures are needed, and how to clean-up and dispose of pesticides. The use of pesticides purchased for home must be guided by instructions on the label. In many cases, not following these instructions resulted in poisonings.

Product Type

Product Type	Occupational?		Total	%
	Yes	No		
Insecticide	131	341	472	40.3%
Insecticide & Fungicide	3	6	9	0.8%
Insecticide & Herbicide	0	1	1	0.1%
Insecticide & Other	12	17	29	2.5%
Insect Repellent	5	20	25	2.1%
Insect Growth Regulator	9	6	15	1.3%
Herbicide	26	46	72	6.1%
Fungicide	21	7	28	2.4%
Herbicide & Fungicide	1	0	1	0.1%
Rodenticide	1	11	12	1.0%
Disinfectants & Sanitizers	10	37	47	4.0%
Fumigant	2	0	2	0.2%
Multiple (nos)	2	2	4	0.3%
Other	20	3	23	2.0%
Unknown	79	354	433	37.0%
Total	322 (27%)	850 (73%)	1172	100%

Persons may be exposed to multiple product types.

Products identified as insecticides, or containing insecticides, account for the majority of poisonings. In those poisonings where products were clearly identified (433 unknowns excluded) insecticides were involved in 75% of reports. Since some pesticide products contain several different types of ingredient, for example, insecticide and herbicide combination, and that some poisonings involve the use of multiple products, the total number of reports is somewhat higher than the number of people involved, as counted in previous tables. In many cases, it is not possible to determine what pesticide was used. Affected persons report that they used 'some sort of spray', but quickly disposed of the product after they were poisoned. In general, these were likely to be insecticides.

Product Chemical Class

Chemical Class	Occupational?		Total
	Yes	No	
Organochlorine compounds	1	2	3
Organophosphorus compounds (AChE Inhibitor**)	35	90	125
N-methyl carbamates (AChE Inhibitor**)	5	22	27
Pyrethrins	10	16	26
Pyrethroids	57	149	206
Dipyridyl compounds	1	0	1
Chlorophenoxy compounds	3	11	14
Triazines	2	5	7
Organo-metallic compounds	0	3	3
Inorganic compounds	16	22	38
Coumarins	0	7	7
Indandiones	1	1	2
Microbial	7	0	7
Dithiocarbamates	2	1	3
AChE Inhibs. with pyrethrin or pyrethroid only	4	7	11
AChE Inhibs. with pyrethrin or pyrethroid + other	1	1	2
AChE Inhibs. with organochlorine compounds	0	1	1
AChE, with compounds not otherwise listed	1	11	12
Pyrethrin plus pyrethroid only	2	26	28
Pyrethrin plus pyrethroid + other compounds NOS	0	1	1
Other, inc multiple classes not in codes 1 to 16	87	89	176
Multiple ingredients, grouped class codes NOS	8	31	39
Product not identified	79	354	433
Total	322	850	1172

Persons may be exposed to multiple product chemical classes.

** AChE – Acetylcholinesterase

Many pesticide products contain multiple active ingredients that fall into different chemical classes. While all pesticides can be poisonous to people, those that target insects and animals are more likely to cause health effects than those that target plants. In the list above, chemicals identified with the abbreviation AChE, along with pyrethroids and pyrethrins, are used in insecticides. These chemicals affect nerve signal transmission in both insects and humans. A small dose will affect insects more than humans because of the insect's smaller relative size. There has been a trend to replace organophosphates with pyrethrins and pyrethroids as these are both less toxic and less easily absorbed through the skin. Products containing these chemical classes account for 60% of cases where products were clearly identified (433 unknowns excluded).

Surveillance and Follow-up Activities

Surveillance

Surveillance is the ongoing, systematic collection, analysis, and interpretation of health data for purposes of improving health and safety. As with many public health surveillance systems, data must be gleaned from as many potential sources as possible. Few of these sources are designed to support public health initiatives.

By law, the Registry receives reports of pesticide poisonings from medical facilities, physicians and clinical laboratories. In addition, the Registry taps into several other sources:

- *Poison Control Centers*
There are 5 poison control centers in New York State.
- *Hazardous Substance Emergency Event Surveillance (HSEES)*
An ATSDR program in the Department of Health that investigates spills & leaks of hazardous substances. When a pesticide is involved, the Registry is notified.
- *Occupational Health Clinics*
There are eight occupational health clinics partially funded by NYS, one of which specializes in agricultural occupational health. The latest Clinic Network brochure can be obtained from the Health Department's web site:
<http://www.health.state.ny.us/environmental/workplace/clinic.htm>
- *Chemical Health Effects Program*
An ongoing Department of Health program which evaluates chemical toxicity for all aspects of DOH involvement in environmental health, including risk assessments for water & food contaminations. Receives EPA 6(a)(2) Notices.
- *Agricultural Nurse Program*
A NIOSH funded program that focused on all aspects of farm and agriculturally related accidents, injuries and poisonings, (funded from 1991 to 2000).
- *Indoor Health Assessment Section*
This group investigates complaints of indoor air problems, and if pesticide-related, refers symptomatic individuals to the PPR.

Follow-up & Referral

Over the course of the grant, PPR staff have conducted outreach with the following organizations:

- All hospital emergency rooms in NYS
- Physicians certified in emergency medicine in NYS
- Physicians certified in occupational health medicine in NYS
- All migrant health care contractors funded by NYS
- Migrant health care providers in NYS
- The major HMOs (13) in NYS
- All Poison Control Centers (5) in NYS and the Poison Education Center
- All Medicaid providers in NYS
- Several Medical Societies
- School Nurses
- All county & city health departments in NYS
- NYCDHMH and providers in their newsletter circulation

In our initial contact, each of these received program posters, brochures, stickers containing the toll-free reporting hotline, and a copy of EPA's *Recognition and Management of Pesticide Poisoning*, 5th edition. Each HMO, Poison Control Center and NYCDHMH included a short article describing the PPR and reporting requirements in their provider newsletter. Each has been contacted annually thereafter.

General Information

What is a pesticide?

The term 'pesticide' is applied to an astonishingly broad range of substances used to alleviate problems caused by an equally astonishing range of living organisms. Generally referred to as pests, these organisms may be weeds, insects, rodents, molds, bacteria, viruses or birds, just to name a few.

Each of these substances may be hazardous to people to some extent. They are chosen because of the way they affect the biology of the target pest. Some are outright toxic, and work by poisoning the target organism, while some may affect some aspect of the life cycle of the target organism.

Integrated Pest Management (IPM)

This report highlights the problems of treating pest problems with chemicals. In most cases, there are several ways to deal with pests that do not require the use of chemicals. By paying some attention to other methods of pest control, the use of chemicals can be reduced or avoided. The process of evaluating the possible ways of dealing with pest problems is called Integrated Pest Management, or IPM. IPM is a systematic approach to managing pests which focuses on long-term prevention or suppression with minimal impact on human health, the environment and nontarget organisms.

For example, in rural areas, mice begin entering homes in the autumn seeking warmth and shelter from the approaching winter. Mouse infestations can be handled in several ways:

- Spring traps can be set along baseboards, where mice typically travel.
- Poison baits can be set in similar locations.
- Cracks in the building foundation can be sealed to prevent mice entering the home.

If we use an IPM approach, we see that while there are many factors that affect which measure to take, some stand out:

- Spring traps must be placed where children and pets can not get harmed; spring traps must be monitored daily and must be disposed of if successful (not often a pleasant task),
- Poison baits must also be placed carefully; however, it is not often known if the now toxic mouse poses a threat to pets which may treat it as prey.
- Foundation repair is effective for many years, does not involve poisons of any kind, and is safer for children and pets living in the home.

Similarly, it is possible to deal with mosquitoes in a number of ways:

- Clothing can prevent mosquitos from biting.
- They can simply be swatted when they land.
- They can be sprayed with a substance that kills the mosquito. This could be an aerosol spray can, or community-wide aerial spraying from an aircraft.
- They can be prevented from landing by using an insect repellent.
- They can be lured into traps using a chemical scent.
- Their numbers can be reduced by applying a substance to breeding pools which prevents them from leaving the water; small breeding pools can be drained.

Using an IPM approach, we might think of the following:

- Swatting a mosquito after it bites may not prevent transmission of a disease, such as West Nile Virus.
- Sprays are not very accurate; the spray cloud can be carried in many directions, possibly onto food items, persons or animals.
- Repellents, such as DEET, can be absorbed through the skin if not properly applied.
- Traps must be placed away from areas where children play.
- Draining small breeding pools is easy, but larger pools (such as wet lands or swamps) must be treated.

In this case, several approaches may be necessary.

- Personal protection from mosquitoes may involve repellents or traps, if risks to children are considered properly.
- Draining small breeding pools can easily be done around the home.
- Community-wide spraying cannot be done by individuals, and is generally done only in response to the confirmed presence of disease carrying insects.

In both examples, some choices involve physical measures, some use chemicals, and some involve making environmental changes. The presence of children and pets in the home must be considered. But it is often possible to take measures which avoid toxic pesticides completely. Weighing all the factors before selecting an option is important and can eliminate the possibility of pesticide poisoning.

There are several case studies which illustrate the hazards of pesticides in the sections that follow.

Buying and Using Pesticides

The use of chemicals to deal with pest problems is a highly regulated activity. The EPA was established in 1970 to protect human and environmental health, and regulating pesticide use was one of its charges. The chemicals must be tested for toxic effects and registered with the EPA. When a manufacturer or formulator wants to sell a product, the product must be registered with the EPA.

Not all things you buy to prevent pest damage are regulated by the EPA. Mouse traps and fly swatters are not; neither contains a chemical. Similar devices that use a scent to lure pests into a trap are regulated by the EPA because of the chemical they contain.

Some products contain ingredients which are so toxic, that the EPA only allows them to be sold to trained and licensed individuals. This also applies to use of these substances on private property. When the toxicity is relatively low, and products can be used safely in the home, the EPA allows them to be sold 'over-the-counter' (or OTC) in grocery or home and garden stores, for example.

In addition to EPA registration, all pesticides sold in New York State must be registered by the Department of Environmental Conservation. Over-the-counter, also called 'general use', pesticide products are intended to be applied by individuals only in their own living spaces. Even over-the-counter products must be applied by a licensed applicator when applying to non-residential areas or areas where someone else lives. For example, all professional pest control workers must be licensed, and apartment superintendents must be licensed applicators if they apply pesticides within other resident's apartments or shared common areas.

But though the toxicity is relatively low, it is still possible for OTC products to be very dangerous. This report highlighted some events where OTC products were not used according to label instructions, and serious illnesses have occurred.

Appendices

A. Regulatory Authority

The Pesticide Poisoning Registry was established in 1990 within Part 22 of the State Sanitary Code. Part 22 includes a number of additional environmental disease registries, such as heavy metals poisoning, and some lung diseases. The privacy of personal information collected under Part 22 is assured by the provisions of Public Health Law 206(1)(j) and 225(5)(t).

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

PUBLIC HEALTH LAW
DEPARTMENT OF HEALTH

Article 2, Title I

§ 206. Commissioner; general powers and duties

1. The commissioner shall:
 - (j) cause to be made such scientific studies and research which have for their purpose the reduction of morbidity and mortality and the improvement of the quality of medical care through the conduction of medical audits within the state. In conducting such studies and research, the commissioner is authorized to receive reports on forms prepared by him and the furnishing of such information to the commissioner, or his authorized representatives, shall not subject any person, hospital, sanitarium, rest home, nursing home, or other person or agency furnishing such information to any action for damages or other relief. Such information when received by the commissioner, or his authorized representatives, shall be kept confidential and shall be used solely for the purposes of medical or scientific research or the improvement of the quality of medical care through the conduction of medical audits. Such information shall not be admissible as evidence in any action of any kind in any court or before any other tribunal, board, agency, or person.

Article 2, Title II

§ 225. Public health council; powers and duties; sanitary code

5. The sanitary code may:
 - (t) facilitate epidemiological research into the prevention of environmental diseases, when such research is conducted pursuant to paragraph (j) of subdivision one of section two hundred six of this chapter, by establishing regulations designating as environmentally related diseases those pathological conditions of the body or mind resulting from contact with toxins, mutagens or teratogens in solid, liquid or gaseous form, or in the form of ionizing radiation or nonionizing electromagnetic radiation, and by requiring the reporting of these diseases or suspected cases of such diseases to the department by physicians, medical facilities and clinical laboratories. Any information provided to the department pursuant to such regulations shall be in the form required by the department, and shall be kept confidential and used by the commissioner pursuant to the provisions of paragraph (j) of subdivision one of section two hundred six of this chapter, and other applicable laws relating to the confidential treatment of patient and medical data.

B. Case Definition and Status Definition

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 (the technical definition is at the end of this section) including health effects due to an unpleasant odor, injury from explosion of a product, inhalation of smoke from a burning 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 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

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. However, states may collect data on health effects resulting from disinfectant exposure, and report relevant cases to the national surveillance system.

Laboratory criteria for diagnosis

If available, the following laboratory data can confirm exposure to a pesticide:

- 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. 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 (criteria A, B and C). Scores are either 1, 2, 3, or 4, and are assigned based on all available evidence. The classification matrix follows the criteria section (Table 1). 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.

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 (these findings must be sufficient to satisfy criteria B.1 under Adocumentation of adverse health effect@);
 - 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. At least one of the following must be satisfied to receive a score of "2":
 - a. 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.
 - b. Any new illness or exacerbation of pre-existing illness diagnosed by a licensed physician, but information on signs, symptoms and/or test findings are not available or insufficient for a B.1 or B.2.a 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, 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.)

Table 1 - Case Classification Matrix:

CLASSIFICATION CATEGORIES ¹										
CLASSIFICATION CRITERIA	Definite Case	Probable Case		Possible Case	Suspicious Case	Unlikely Case	Insufficient Information		Not a Case	
		1	2				4	-	Asymptomatic ²	Unrelated ³
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. Causal Relationship	1	1	1	1	4	2	-	-	-	3

1. 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.
2. 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.
3. 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.

Comments

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 acute non-occupational pesticide-related illness and injury, contact the National Center for Environmental Health (NCEH) 770-488-3450.

For information concerning regulation and use of pesticides, contact the Office of Pesticide Programs, US EPA, at 703-305-5336. The National Pesticide Information Center (1-800-858-7378) provides information about pesticides, acute pesticide-related illness and injury, and the toxicology and environmental chemistry of pesticides.

Official Definition of a Pesticide

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.

C. List of Abbreviations

AChE	Acetylcholinesterase
ATSDR	Agency for Toxic Substances and Disease Registry
BOH	Bureau of Occupational Health
CEH	Center for Environmental Health
CSTE	Council of State and Territorial Epidemiologists
EPA	Environmental Protection Agency
IPM	Integrated Pest Management
NIOSH	National Institute for Occupational Safety and Health
NYCDHMH	New York City Department of Health and Mental Hygiene.
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OTC	Over-the-counter (general use pesticides)
PCC	Poison Control Center
PPR	Pesticide Poisoning Registry
USEPA	United State Environmental Protection Agency