

Summary of Health-Related Pesticide Incidents Reported in Louisiana from October 2000 through September 2001



Louisiana Department of Health and Hospitals
Office of Public Health
Section of Environmental Epidemiology and Toxicology

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Abstract

Louisiana's Health-Related Pesticide Incident Report (HRPIR) Program is a complaint-based, statewide surveillance program initiated in 1991. The program's purpose is to investigate and evaluate reported adverse health effects associated with acute pesticide exposures. The Louisiana Department of Agriculture and Forestry (LDAF) and the Louisiana Department of Health and Hospitals (LDHH) jointly investigate complaints. A descriptive summary of the HRPIRs investigated from October 2000 through September 2001 is presented in this report.

During the one-year period (October 2000 through September 2001), 27 health-related pesticide incidents involving 36 individuals (cases) were investigated by LDAF and LDHH. Cases were classified according to standard case classification criteria (NIOSH, 2000). Classification categories are based on the degree of association of health effects with the reported pesticide exposure. Classification of the 27 incidents by health effects includes 3 confirmed (11%), 8 likely (30%), 6 possible (22%), 1 unlikely (4%), 6 insufficient evidence (22%), 2 not pesticide-related (8%), and 1 no symptoms reported (4%).

I. INTRODUCTION

Pesticides are chemicals developed to repel, control, or kill pests, such as insects, weeds, rodents, or fungi. The Louisiana Department of Agriculture & Forestry (LDAF) registers over 11,000 pesticides for use statewide (LDAF, 2002). Some of these products are registered for restricted use, requiring application by certified applicators or people under their supervision, while others are registered for general, household use. Although the majority of pesticides are used on crops, pesticides are also widely used in and around the home, in workplaces, and public places such as schools and parks. The widespread use of pesticides in society has increased the risk of inadvertent pesticide exposure for all segments of the population.

Circumstances resulting in inadvertent exposure to pesticides include drift or overspray, occupational exposure, and household exposure. Drift or overspray occurs when pesticide spray from an airplane, tractor or a home sprayer drifts or blows onto people living, working or going to school near agricultural fields or other application sites. Occupational exposure occurs when a worker, farmworker, applicator, or mixer, touches or inhales a pesticide. Workers may also unknowingly expose their families by carrying pesticides into the home on their bodies and clothes. Household exposure can occur through the improper handling, storage, and application of household pesticides and exposure to residue of pesticide applications made in and around the home.

Health effects associated with pesticide exposure vary according to many factors: pesticide toxicity, dose, duration and frequency of exposure, route of exposure, exposure to other chemicals, and age and health of affected individuals. Acute, or short-term, exposure to organophosphate insecticides, the most widely used category of insecticide, can cause headaches, nausea, diarrhea, respiratory depression, seizures, and loss of consciousness. Acute exposure to herbicides can cause eye and skin irritation, coughing, burning of the throat and lungs, dizziness, nausea, and temporary incoordination. Research also suggests adverse health effects resulting from chronic, or long-term, exposure to some pesticides.

In 1991, the Louisiana Department of Agriculture and Forestry (LDAF) and the Louisiana Department of Health and Hospitals (LDHH) established the Health-Related Pesticide Incident Report (HRPIR) Program. The purpose of this statewide program is to investigate and evaluate adverse health effects associated with acute pesticide exposure occurring in Louisiana. The HRPIR Program is complaint-based: only pesticide exposure incidents reported to LDAF and LDHH are investigated. This report contains a descriptive summary of HRPIR data from October 2000 through September 2001.

II. INVESTIGATIVE PROCESS: HEALTH-RELATED PESTICIDE INCIDENT REPORT PROGRAM

A Health-Related Pesticide Incident Report (HRPIR) is initiated when the Louisiana Department of Agriculture and Forestry Office of Agricultural and Environmental Sciences/ Pesticide and Environmental Programs (LDAF) receives a complaint of health effects possibly associated with pesticide exposure. A LDAF Inspector visits the site of the incident, takes a written statement from the complainant(s) regarding the circumstances of exposure and reported health effects, and collects environmental evidence (e.g., applicator's records, environmental samples). LDAF evaluates the collected information to determine if a pesticide has been misused.

Information collected by LDAF is immediately forwarded to the Louisiana Department of Health and Hospitals Office of Public Health/ Section of Environmental Epidemiology and Toxicology (LDHH). LDHH interviews complainants about the incident, eliciting additional information about the circumstance of exposure and reported health effects. When appropriate, medical records are obtained. Toxicological information from pesticide labels, Material Safety Data Sheets (MSDS), and health studies are also reviewed. LDHH evaluates the collected information to determine the likelihood that the pesticide(s) caused the reported health effects and evaluates the possibility of long-term health effects associated with the pesticide exposure. LDAF and LDHH each provide the complainant with a final report.

III. RESULTS

Results represent data from Health-Related Pesticide Incident Reports (HRPIR) filed from October 2000 through September 2001. Data were obtained from LDAF summary reports, HRPIR investigation forms, environmental samples, applicators' records, medical records, and complainants' statements.

Throughout this report, an *incident* is defined as a reported health-related pesticide event affecting at least one person. Each individual affected by a single incident is considered a *case*. Therefore, many cases may be included in one incident. The health effects associated with a reported pesticide exposure are evaluated individually by case.

A. Case Classification

Cases are classified using the National Institute for Occupational Safety and Health's case definition for acute pesticide-related illness and injury. Classification categories consider the level of certainty of exposure, documentation of health effects, and the plausibility of reported health effects based on the known toxicology of the pesticide(s) (NIOSH, 2000). The strongest evidence of pesticide exposure is confirmation of exposure by environmental or biological samples, and of health effects by medical records.

Case Classification Categories for Acute Pesticide-Related Illness and Injury (NIOSH, 2000):

Confirmed Case

Definition: Health effects confirmed as being associated with pesticide exposure.

Criteria:

1. Laboratory, clinical, or environmental evidence corroborate exposure;
2. New post-exposure abnormal signs* and/or test/laboratory findings reported by a licensed health care provider; and
3. Consistent evidence of a causal relationship between the identified pesticide and the health effects based on the known toxicology of the pesticide.

Likely Case

Definition: Health effects likely associated with pesticide exposure.

Criteria:

1. Laboratory, clinical or environmental evidence corroborate exposure;
2. New post-exposure abnormal symptoms† were reported; and
3. Consistent evidence of a causal relationship between the identified pesticide and the health effects based on the known toxicology of the pesticide.

OR

1. Evidence of exposure based solely upon written or verbal report;
2. New post-exposure abnormal signs* and/or test/laboratory findings reported by a licensed health care provider; and,
3. Consistent evidence of a causal relationship between the identified pesticide and the health effects based on the known toxicology of the pesticide.

Possible Case

Definition: Health effects possibly associated with pesticide exposure.

Criteria:

1. Evidence of exposure based solely upon written or verbal report;
2. New post-exposure abnormal symptoms† were reported; and
3. Consistent evidence of a causal relationship between the identified pesticide and the health effects based on the known toxicology of the pesticide.

Unlikely Case

Definition: Health effects unlikely associated with pesticide exposure.

Criteria:

1. Laboratory, clinical or environmental evidence corroborate exposure, or evidence of exposure based solely upon written or verbal report;
2. New post-exposure abnormal signs*, symptoms†, and/or test/laboratory findings were reported; and
3. Evidence of health effects based on pesticide exposure is not present (e.g., exposure dose was insufficient to produce observed health effects, temporal relationship does not exist).

Insufficient Information

Definition: There is insufficient health and/or exposure data.

Criteria:

1. Insufficient health and/or exposure data to evaluate case's health effects.

No Symptoms Reported/ Not Pesticide-Related

Definition: Health effects were not experienced by the case.

Criteria:

1. No health effects were experienced or reported by the case; or
2. Definite evidence of a cause other than pesticide exposure.

* Signs are objective findings that can be observed and described by a licensed healthcare professional.

† Symptoms are any subjective evidence of a disease or condition as perceived and reported by the affected individual.

Figure 1 depicts the total number of reported incidents and cases. There were 27 incidents and 36 cases during the one-year period.

Figure 1: Classification of Health-Related Pesticide Incidents and Incidents: October 2000- September 2001

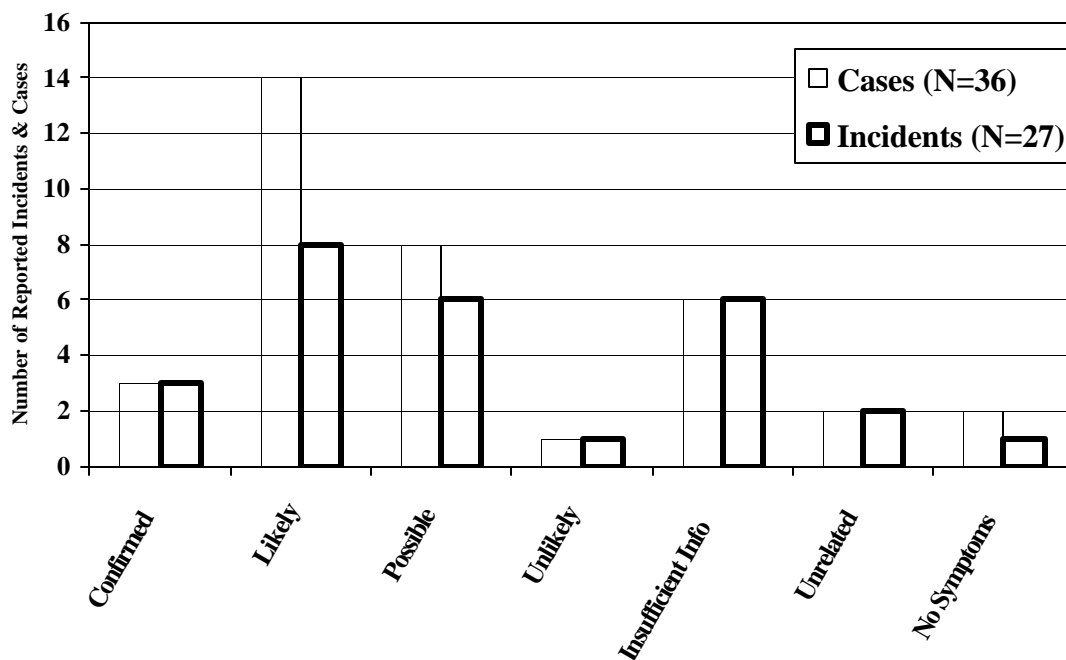


Figure 1 categorizes cases and incidents by reported health effects. Of the 36 cases reported from October 2000 through September 2001, 25 (69%) experienced symptoms associated with pesticide exposure. Based on NIOSH’s case classification system, there were 3 confirmed cases (8%), 14 likely cases (39%), and 8 possible cases (22%). The remaining cases had health effects that were unlikely associated with pesticide exposure (1 case, 3%), not pesticide-related (2 cases, 6%), or insufficient data (6 cases, 17%). There were no symptoms reported for 2 cases (6%). Incidents with more than one case were classified according to the classification category of the strongest case (i.e., confirmed was the strongest, followed by likely).

B. Demographics of Cases: Age and Sex

Table 1 displays the age and sex of the 36 cases.

Table 1: Cases by Age and Sex: October 2000 - September 2001 (36 Cases)

Age Group	Male	Female	Total	
	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>%</u>
0 - 4	0	0	0	-
5 - 9	0	2	2	6
10 - 14	2	0	2	6
15 - 19	0	0	0	-
20 - 29	1	2	3	8
30 - 39	4	2	6	17
40 - 49	3	6	9	25
50 - 59	5	2	7	19
60 - 69	3	1	4	11
70 - 79	1	0	1	3
80 - 89	1	1	2	6
Total	20	16	36	100

Cases include 20 males (56%) and 16 females (44%). The median age was 42 years (range: 8 to 85 years). The majority of cases (32 cases, 89%) were adults over the age of nineteen years.

C. Occupational Health-Related Pesticide Incidents

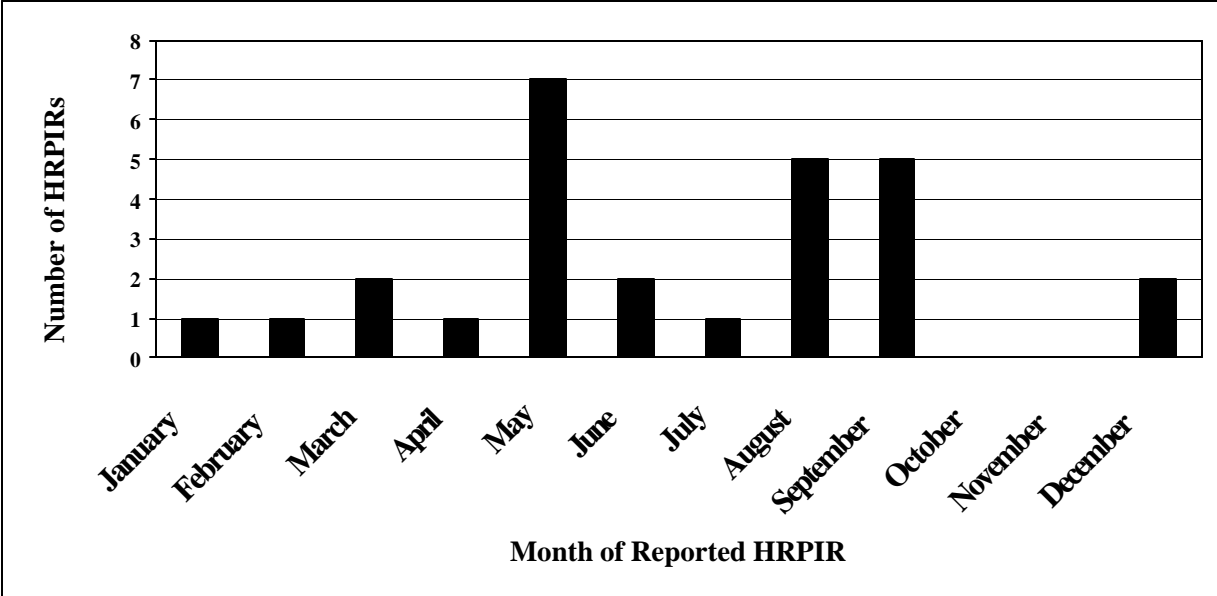
During the one-year period, there were 4 occupational health-related pesticide incidents involving 7 cases. Incidents are considered occupationally related if the reported pesticide exposure occurred while the exposed individual was at work. Work-related incidents include reported exposures occurring on employer premises, work for a family business, travel on business, and work for pay or compensation at home. Classification of reported occupational cases is as follows: likely (2 cases), possible (3 cases), insufficient information (1 case), and asymptomatic (1 case).

The 2 likely cases were nursery employees who were exposed to drift from an aerial pesticide application made to a neighboring cotton field. The 3 possible cases involved boll weevil trappers working in cotton fields who were exposed to pesticides from an aerial application.

D. Incidents by Month of Occurrence

As shown in Figure 2, the months with the greatest numbers of reported incidents are May, August and September. There was an average of 2.25 incidents per month.

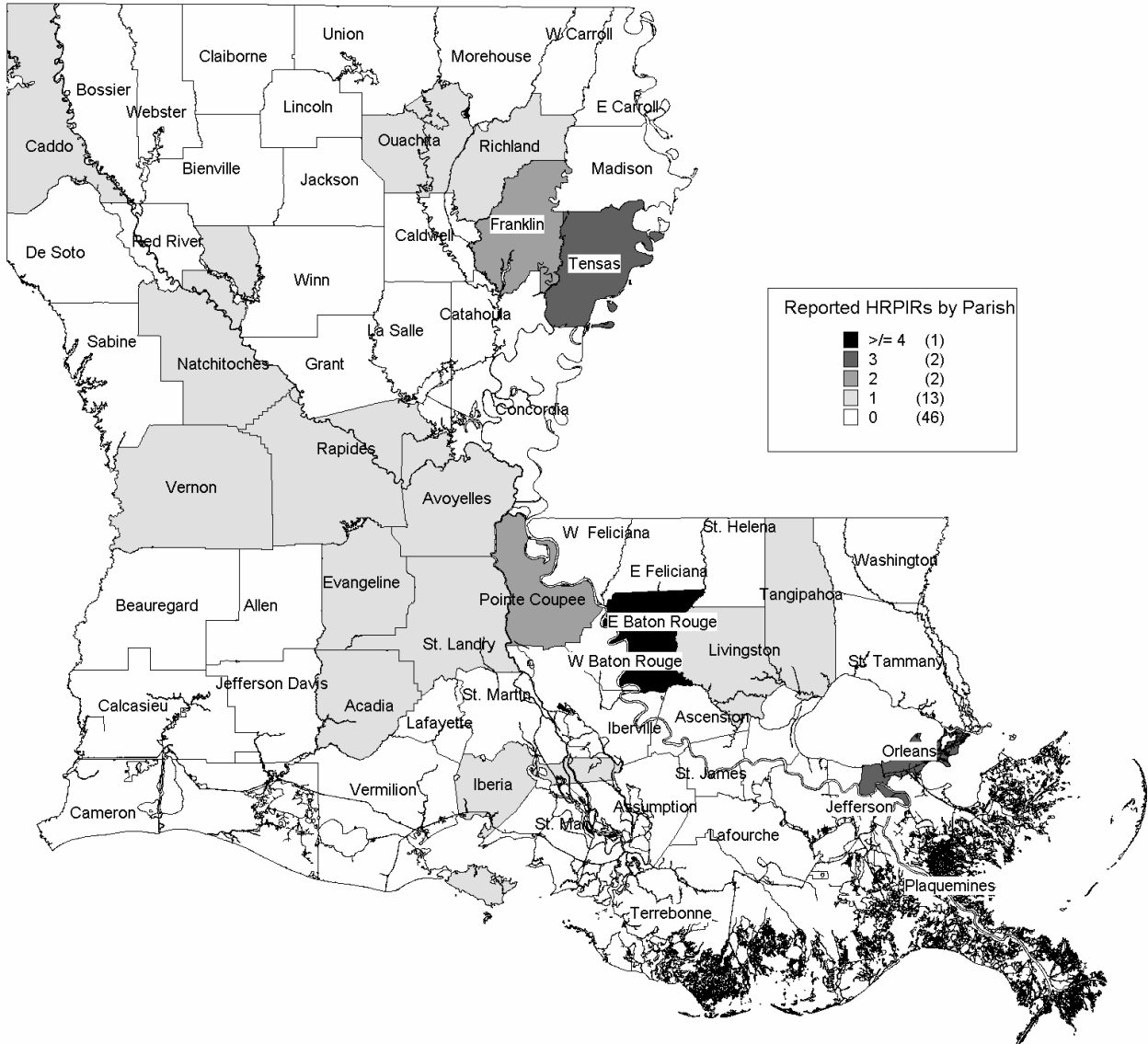
**Figure 2: Health-Related Pesticide Incidents by Month of Occurrence:
October 2000 - September 2001**



E. Incidents by Parish

Of Louisiana's 64 parishes, 18 (28%) had at least 1 reported HRPIR during the one-year period. East Baton Rouge had the highest number of incidents with 4 incidents.

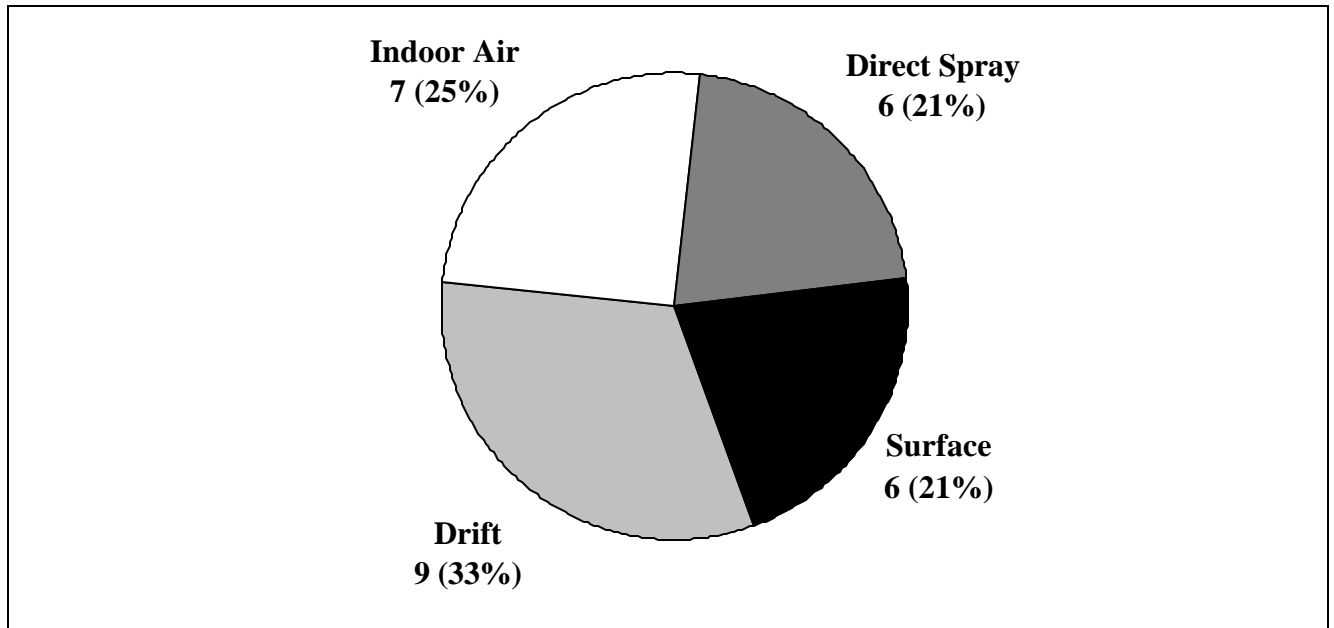
Figure 3: Health-Related Pesticide Incidents by Parish: October 2000 - September 2001 (27 Incidents)



F. Circumstance of Health-Related Pesticide Incidents

Figure 4 represents incidents by circumstance of reported exposure. Circumstance refers to how a person was exposed to a pesticide.

**Figure 4: Health-Related Pesticide Incidents by Circumstance:
October 2000 – September 2001 (27 Incidents)**



* 1 incident reported contact with contaminated indoor air and surface.

Most incidents involved drift of a pesticide either from an aerial or ground application (9 incidents/12 cases) or contact with contaminated indoor air (7 incidents/11 cases). Other circumstances of reported exposure include direct spray (6 incidents or 7 cases) and contact with a treated surface such as a plant, carpet, or animal (6 incidents/6 cases).

Drift/Direct Spray

All of the (6 incidents/7 cases) from direct spray and (8 incidents/ 11cases) from drift incidents involved reported exposure to an aerial application of an agricultural pesticide. The remaining drift incident (1 incident/1 case) involved an exposure from a mosquito control application.

Indoor Air

Seven incidents involving 11 cases reported pesticide exposure from contaminated indoor air. The reported circumstances of exposure include termiticide applications (3 incidents/4 cases), pest control applications (3 incidents/6 cases), and air conditioning duct treatment (1 incident/ 1 case).

Surface

Six incidents involving 6 cases reported pesticide exposure from contact with a sprayed surface. Four incidents involved reported exposure resulting from an indoor application either from a self-application (2 incidents/2 cases) or a professional application (2 incident/3 cases).

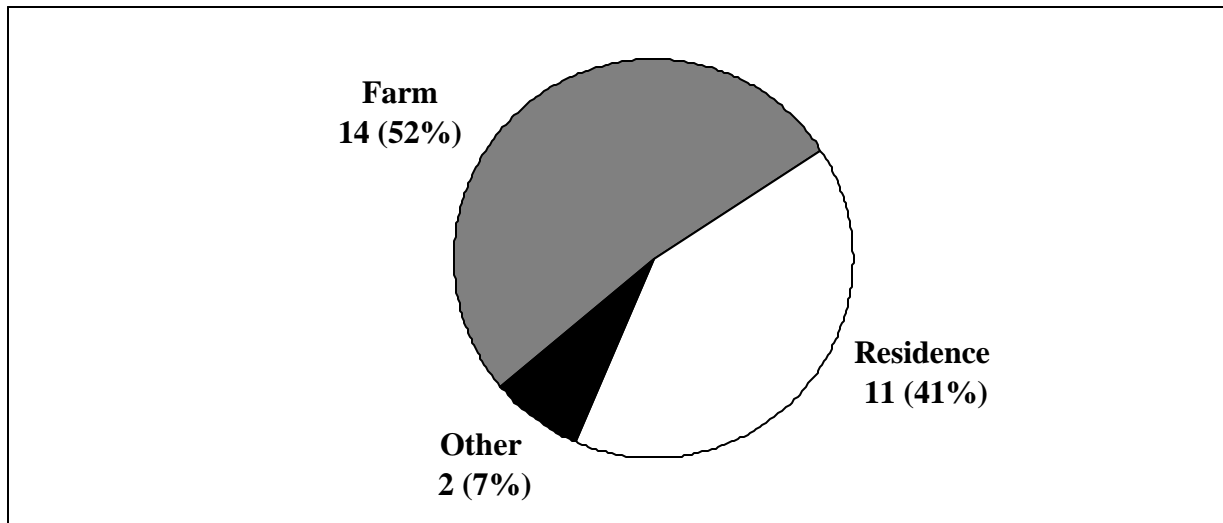
The remaining surface incidents involved contact with contaminated soil resulting from a spill of an herbicide onto residential property (1 incident/1 case) and ingestion of a sprayed food item (1 incident/1 case).

G. Location of Pesticide Incident

The location of pesticide incident refers to where the pesticide was applied, or the location of it's intended target. Fifty-two percent of the incidents (14 incidents) reported exposure to a pesticide that was applied to a farm. These incidents resulted in reported exposure via drift (11 cases) and direct spray (7 cases).

The targeted crops for the 14 farm-related incidents include cotton (6 incidents), sugarcane (2 incidents), and rice (2 incidents).

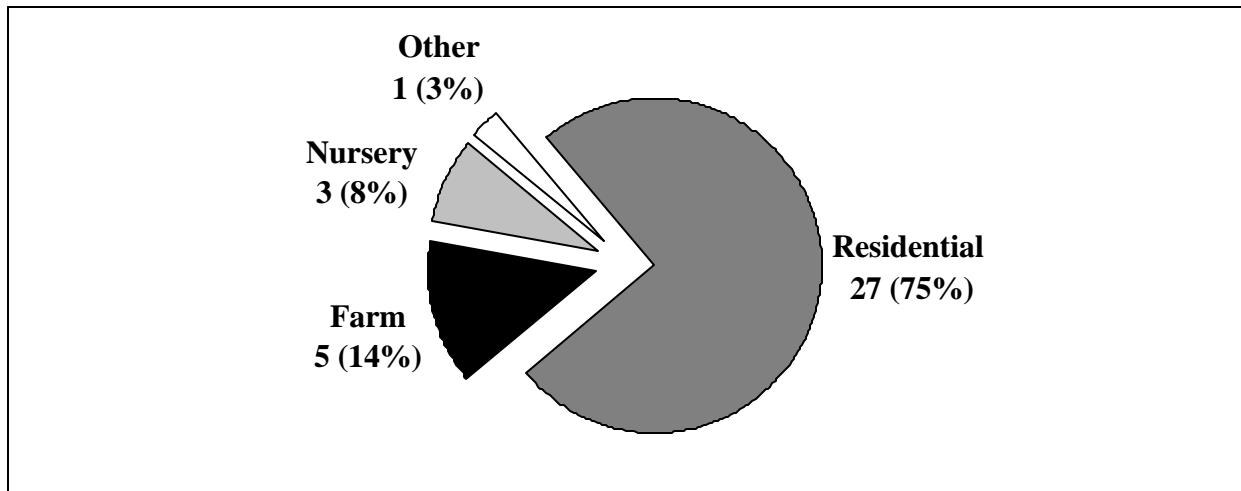
**Figure 5: Health-Related Pesticide Incidents by Location of Incident:
October 2000 – September 2001 (27 Incidents)**



H. Location of Pesticide Exposure

The location of health-related pesticide exposure refers to the place where the person reported exposure to a pesticide or experienced symptoms possibly associated with pesticide exposure. As shown in Figure 6, the majority of cases were exposed in a residential location (75%): home, yard, or other residential setting.

**Figure 6: Health-Related Pesticide Incidents by Location of Exposure:
October 2000 – September 2001 (36 Cases)**



I. Type of Pesticide

The majority of incidents involved an insecticide application (17 incidents, or 63%). The remaining 10 incidents include herbicide application (3 incidents, or 15%), urea fertilizer (2 incidents, or 7%), and HVAC cleaning and sanitizing products (1 incident, 4%). No pesticide was identified for 3 incidents (15%).

Sixty-three percent of the incidents involved the application of 1 product. Seven incidents involved multiple products: 2 products (4 incidents), 3 products (2 incidents), and 4 products (1 incident). Table 2 lists the active ingredients, chemical type/class, and number of occurrences for all incidents involving a pesticide application.

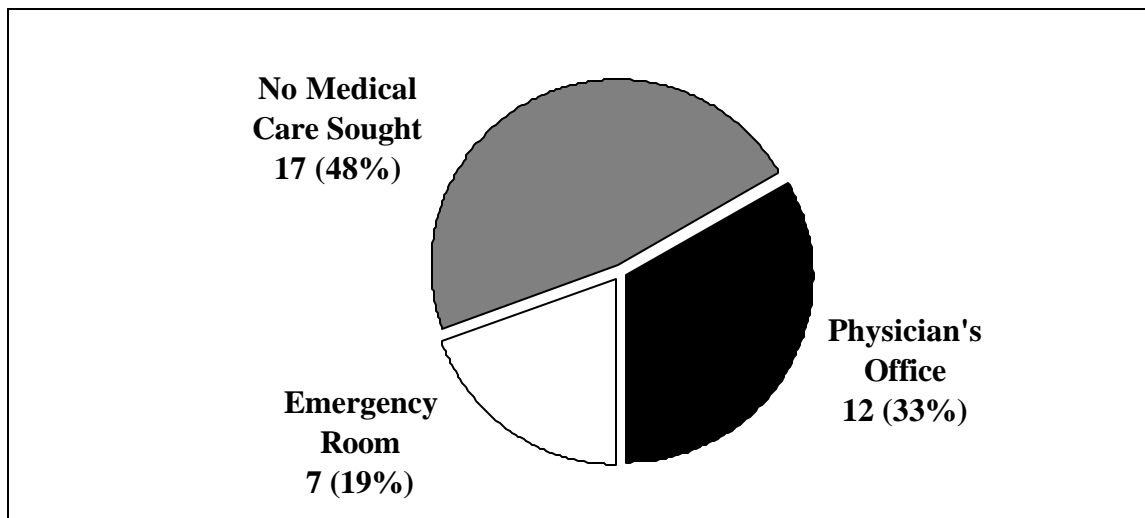
**Table 2: Health-Related Pesticide Incidents by Type of Pesticide:
October 2000 – September 2001 (27 Incidents)**

Active Ingredient	Chemical Type/Class	Total Occurrences
Acephate	Insecticide/Organophosphate	2
Allethrin	Insecticide/Pyrethroid	1
Bensulfuron-methyl	Herbicide/sulfonylurea	1
Chlorpyrifos	Insecticide/Organophosphate	2
Cyfluthrin	Insecticide/Pyrethroid	2
Cyhalothrin	Insecticide/Pyrethroid	2
Cypermethrin	Insecticide/Pyrethroid	1
Endothall	Herbicide	1
Fipronil	Insecticide	1
Glyphosate	Herbicide	1
Halosulfuron	Herbicide	1
Hexazinone	Herbicide/Triazinone	1
Hydramethylnon	Insecticide	1
Imidacloprid	Insecticide/Chloro-nicotinyl	1
Malathion	Insecticide/Organophosphate	1
Methyl parathion	Insecticide/Organophosphate	2
Molinate	Herbicide/Thiocarbamate	1
Phenothrin	Insecticide/Pyrethroid	2
Profenofos	Insecticide/Organophosphate	1
Propanil	Herbicide/Anilide	1
Quinclorac	Herbicide	1
Resmethrin	Insecticide/Pyrethroid	1
Sodium Chloride	Inorganic	1
Sulfometuron methyl	Herbicide/sulfonylurea	1
Thidiazuron	Herbicide/Urea	1
Thiodicarb	Insecticide/Carbamate	1
Tribufos	Herbicide/Organophosphate	1

J. Healthcare Utilization

Cases were categorized according to healthcare utilization: emergency room visit, clinic visit, or no medical care sought. Clinic visit represents a non-emergency room visit made by a case following exposure to a pesticide. Unlike emergency room visits, which usually occur immediately after exposure to a pesticide, clinic visits may occur several days or weeks after the exposure incident.

**Figure 7: Healthcare Utilization by Case Classification
October 2000 – September 2001 (36 Cases)**



As depicted in Figure 7, 19% of the cases sought emergency medical care following exposure, and 33% had a clinic visit (12 cases). Forty-eight percent of the cases did not seek any medical care (17 cases).

K. Severity of Health Effects

Cases were categorized according to the severity of their health effects: mild, moderate, severe, and fatal. Severe refers to systemic health effects requiring aggressive medical treatment or hospitalization and topical burns, ulceration, or irritations requiring medical treatment. Moderate health effects typically resolve without medical treatment and are of short duration, and mild health effects are minimally bothersome and rapidly resolved.

**Figure 8: Severity of Health Effects by Case Classification
October 2000 - September 2001 (36 Cases)**

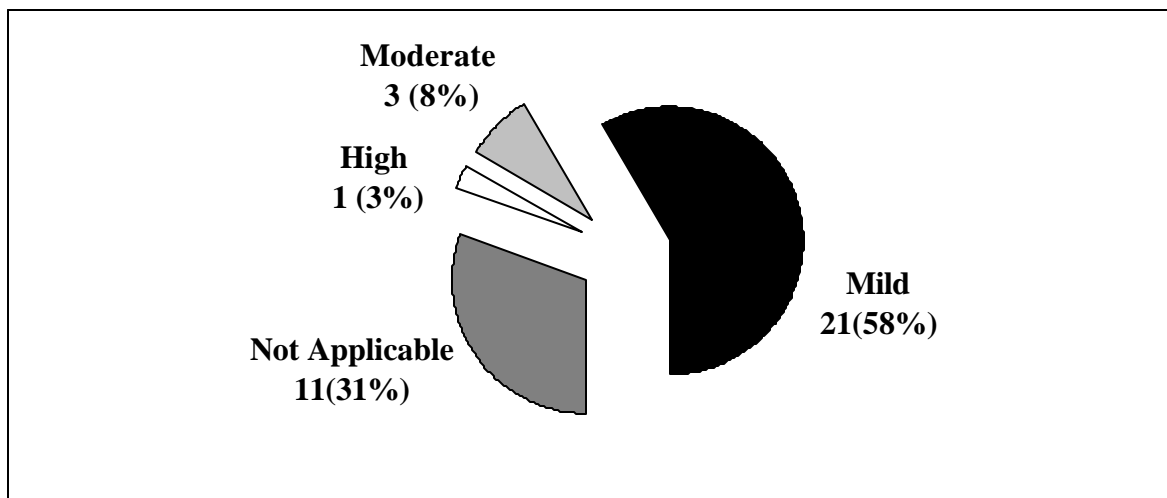


Figure 8 shows that 21 (58%) cases experienced mild health effects, 3 cases (8%) experienced moderate effects, and 1 case (3%) had severe health effects. Severity was not ascertained for the 11 cases classified as unlikely, insufficient information, no reported symptoms, or unrelated.

IV. DISCUSSION

During the one-year period, October 2000 through September 2001, there were 27 Health-Related Pesticide Incident Reports (HRPIRs) involving 36 cases investigated by the Louisiana Department of Agriculture & Forestry (LDAF) and the Louisiana Department of Health & Hospitals (LDHH). The investigation of HRPIRs involves in-depth review of environmental and health data associated with each incident. Analysis of the data illustrates the types of pesticide exposure occurring in Louisiana.

Report Data

Most HRPIRs are initiated by a complainant in response to a perceived pesticide misapplication, usually made by someone other than the complaint (e.g., professional applicator, neighbor). The complaint-based nature of the HRPIR program is dependent on many individual factors such as knowledge of how to file a HRPIR, willingness to file a complaint, and recognition of pesticide exposure. Although the Louisiana Pesticide Law requires physicians who treat a medical complaint diagnosed as caused by pesticide poisoning to provide notice of the poisoning to LDAF, physician reports of pesticide illness are rarely received (Louisiana Revised Statutes. 3:3208). During the 2000-2001 reporting period, there were no physician-referred reports.

Fewer reported incidents and cases were received during the 2000-2001 reporting period than previous reporting periods. Analysis of HRPIRs from October 1995 through September 2000 indicates a median of 33 incidents and 57 cases per year (Louisiana Department of Health & Hospitals, 2002). The number of incidents per year ranged from 20 to 41, and the number of cases per year ranged from 43 to 116.

The increase in the number of reported incidents during warm months (May, August, and September) likely reflects a seasonal increase in agricultural pesticide applications, especially insecticide applications. Thirteen of the 14 incidents reporting exposure to an aerial pesticide application intended for an agricultural field occurred during the months of May through September.

Demographics

HRPIRs were received from all areas of the state, although 72% of the parishes did not report any health-related pesticide exposure incidents during the one-year period. East Baton Rouge Parish had the greatest number of HRPIRs.

There were 4 children less than 18 years of age who reported pesticide exposure. All of the children had health effects associated with pesticide exposure (1 confirmed, 2 likely, and 1 possible). Three children developed minor symptoms associated with exposure to synthetic pyrethroids applied to the interior of their home, and one child developed moderately severe symptoms associated with exposure to methyl parathion that was aerially applied to a neighboring cotton field. There were no pesticide exposure reports from pregnant women during this reporting period.

Childhood pesticide exposures are of particular concern because children are at a greater risk of health effects from pesticide exposure than adults. Research suggests that children are less able to detoxify chemicals than adults and that exposures sustained early in life, including prenatal exposures, appear more likely to lead to disease than similar exposures encountered later in life (Landigran, 1999). Children are also at greater risk than adults of exposure to pesticide residues on sprayed surfaces. Due to their play and hand-to-mouth activities, children are in closer and more frequent contact with the physical environment (e.g., interior of home, backyard) than adults.

Circumstance of Pesticide Exposure

The majority of reported incidents involved exposure to aerial drift or direct spray from an agricultural pesticide application. There were 19 cases exposed via direct spray or drift. Of these cases, 12 had health effects associated with exposure: 1 confirmed, 7 likely, and 4 possible. Most of the 12 cases experienced mild health effects (9 cases). Three cases had moderate health effects.

Five of the 12 cases (2 likely, and 3 possible) were exposed while working. All of these cases were exposed to drift of agricultural pesticides (malathion, acephate, and cyfluthrin) that were aerially applied to cotton fields. The cases were performing non-agricultural work on or near a field that was being sprayed. The 7 remaining cases with health effects associated with pesticide exposure were exposed to an agricultural pesticide while on their own property. Exposure occurred either via drift (5 cases) or direct spray (2). Five cases were exposed to an organophosphate insecticide, 1 to a pyrethroid, and 1 to the herbicide glyphosate.

Eleven cases reported pesticide exposure from indoor air. Ten of these cases had health effects associated with pesticide exposure (1 confirmed, 7 likely, and 2 possible). Of these 10 cases, all had mild symptoms, except 1 case with severe, life-threatening health effects. Indoor air cases were exposed primarily to pyrethroids (5 cases). The remaining cases were exposed to several different classes of pesticides: fipronil (2 cases), organophosphate (1 case), imidacloprid (1 case) and inorganic compounds (1 case).

Type of Pesticides

Pesticides are classified according to the type of pest they are designed to control. The majority of HRPIRs involved reported exposure to an insecticide. The classes of insecticides most commonly associated with reports include organophosphates and synthetic pyrethroids.

Organophosphates involved in a HRPIR during the 2000-2001 reporting period include acephate, chlorpyrifos, malathion, methyl parathion and profenofos. Exposure to organophosphates causes cholinesterase inhibition. Some of the most commonly reported early symptoms resulting from exposure to cholinesterase inhibiting insecticides are headache, nausea, dizziness, and excessive sweating. Serious organophosphate poisoning can cause diarrhea, muscle twitching, weakness, vomiting, seizures, loss of consciousness, and death. The primary cause of death from organophosphate poisoning is respiratory failure (U.S. EPA, March 1999).

Symptoms of organophosphate poisoning develop during or after exposure, within minutes to hours, depending on the route of exposure and dose. Exposure by inhalation results in the fastest appearance of toxic symptoms followed by ingestion and skin contact. Repeated or prolonged exposure to organophosphates may result in the same effects as acute exposure. Workers repeatedly exposed to chlorpyrifos experienced impaired memory and concentration, disorientation, severe depression, irritability, confusion, headache, delayed reaction times, nightmares, sleepwalking, and drowsiness (Extension Toxicology Network, 1996). Chronic exposure to low levels of organophosphates that are insufficient to produce signs and symptoms of acute poisoning may produce an influenza-type illness characterized by weakness, anorexia, and malaise (Eskenazi, 1999). Children exposed to cholinesterase inhibitors often present with a different clinical picture than adults. Seizures and mental status changes including lethargy and coma are more common in children. Other common signs in children include muscle weakness, contraction of the pupils, and excessive salivation (U.S. EPA, March 1999).

Reported pyrethroids include allethrin, cyfluthrin, cyhalothrin, cypermethrin, phenothrin, and resmethrin. Contact dermatitis and allergic respiratory reactions are the most common symptoms following exposure to synthetic pyrethroids. Severe exposure can affect the nervous system causing symptoms such as tingling or burning sensation, tremors, disrupted motor function, and seizures. Unlike organophosphates, pyrethroids are poorly absorbed through the skin. Organophosphates and pyrethrins/pyrethroids are the two classes of pesticides most often implicated in symptomatic illnesses resulting from unintentional exposure (U.S. EPA, March 1999).

Health Effects

Fifty-two percent of the cases sought medical care, either from a family physician or emergency department. Medical records were obtained for 63% of the cases with a medical visit. A review of medical records is helpful for documentation of signs and symptoms associated with exposure.

For the 25 cases with health effects associated with exposure, most experienced mild health effects (84%). The moderate and severe cases all involved organophosphate exposure that resulted in medical intervention and/or lost time from work or other normal activities.

Conclusion

Health-Related Pesticide Incident Reports during the reporting period October 2000 through September 2001 provides detailed information about reported pesticide exposures occurring in Louisiana. Data indicate that most incidents are reported during the months of May through September. Sixty-nine percent of the cases reporting exposure to pesticides had health effects associated with pesticide exposure based on LDHH's case classification system. Most cases with associated health effects were exposed at home either inside the home (pest control application) or in the yard (aerial drift or direct spray). Exposures resulting from aerial applications were more likely to involve an organophosphate insecticide while residential applications typically involved synthetic pyrethroids. Health effects associated with the reported pesticide exposures were usually mild and of short duration.

V. REFERENCES

Eskenazi B, Bradman A, Castorina R. Exposures of children to organophosphate pesticides and their potential adverse health effects. *Environ Health Perspect* 107(suppl 3): 409-419, 1999.

Extension Toxicology Network. EXTOWNET. Chlorpyrifos. Cooperative Extension Offices of Cornell University, University of California, Michigan State University, and Oregon State University. 1996.

Landigran PJ, Claudio L, Markowitz SB, Berkowitz GS, Brenner BL, Romero H, Wetmur JG, Matte TD, Gore AC, Codbold JH, Wolff MS. Pesticides and inner-city children: exposure, risks, and prevention. *Environ Health Perspect* 107(suppl 3): 431-437, 1999.

Louisiana Department of Agriculture and Forestry (LDAF), Section of Pesticide Registration. Unpublished data. January 2002.

Louisiana Department of Health and Hospitals, Office of Public Health, Section of Environmental Epidemiology and Toxicology. Summary of health-related pesticide incidents reported in Louisiana from October 1995 through September 2000. June 2002.

Louisiana Revised Statutes. Title 3. Section 3208.

NIOSH. Case definition for acute pesticide-related illness and injury cases reportable to the national public health surveillance system. Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. Jan. 31, 2000. Jan. 17, 2002. <<http://www.cdc.gov/niosh/pestsurv/pdfs/pest-casdef2000.pdf>>.

U.S. EPA. Recognition and management of pesticide poisonings. U.S. Environmental Protection Agency Publication No 735-R-98-003, March 1999.

VI. APPENDIX

Appendix A: Contact Information

Louisiana Department of Agriculture and Forestry (LDAF)

Office of Agricultural & Environmental Sciences

Pesticide & Environmental Programs

P.O. Box 3596

Baton Rouge, LA 70821-3596

24-hour Pesticide Hotline: (225) 925-3763

Website: <http://www.ldaf.state.la.us/>

Louisiana Department of Health & Hospitals (LDHH)

Office of Public Health

Section of Environmental Epidemiology & Toxicology

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Website: <http://oph.dhh.state.la.us/>