

5. CASE INTAKE AND FOLLOW-UP



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5.1 INTRODUCTION

This chapter pertains to surveillance systems whose case ascertainment relies on reports from HCPs, workers' compensation records, PCCs, referral agencies, affected persons, and laboratories. It describes some of the processes and issues associated with case report intake and follow-up. Investigative procedures for cases may differ slightly if long delays exist between time of exposure and receipt of the report, as is often the situation with cases identified via review of workers' compensation data. Timeliness of reports and the PPSP's response can impact the availability of persons for interviews, exposure site conditions, and the feasibility of sampling or collecting physical evidence. Extensive travel time for PPSP or enforcement agency staff to reach an exposure site can also have an impact on the amount of information that is available and therefore the outcome of a site investigation.

The guidelines provided in this chapter are designed for PPSPs without enforcement jurisdiction over pesticide manufacture, use, or disposal. In most States, another agency (e.g., agriculture) is charged with enforcement. These enforcement agencies have guidelines for identifying violations of pesticide statutes or rules. The inspection procedures and manuals used by these agencies are valuable references for non-enforcement investigators. Surveillance program staff are encouraged to use these manuals as reference guides. It is also helpful for surveillance program staff to accompany enforcement program staff on one or two inspections as an observer to gain a better understanding of the agency's inspection process. Any State initiat-

ing a PPSP is highly recommended to visit a State with an existing program, and to accompany the host State's staff on a site investigation, if possible.

5.2 OVERVIEW OF THE CASE INVESTIGATION PROCESS

The case investigation process includes all case-related activities beginning with case intake and ending with the case being prepared for case closure. The main goals of the case investigation process are as follows:

- Obtain sufficient follow-up information to determine whether the reported illness/injury meets the case definition of pesticide-related illness and injury.
- Provide information to the affected persons and/or their HCPs for case management and prevention.
- Provide prevention information and recommendations to the worksite (employer/workers) where the exposure event occurred.
- Determine if aspects of the exposure scenario require additional broader public health intervention.
- Disseminate information about the hazard and relevant prevention measures.

The level of action taken on each goal will depend on the chosen expertise and emphasis of the PPSP. Case follow-up includes the following

- Initial screening and triage of reports to determine whether they meet criteria for inclusion in the surveillance system
- Interviews with the affected person(s)
- Review of medical records, if available, and interview of HCPs, if needed
- Interviews with the applicator, employer, and/or owner
- Obtaining additional pesticide chemical information, as needed
- Identification of other exposed and affected persons
- Notification to the local health department, if necessary or required
- Notification to NIOSH and EPA, if necessary
- Referrals and interagency coordination for additional follow-up and investigation
- Final case review for completeness of data and collection of any additional missing data, if feasible

The initial case follow-up may be all that is needed to investigate a particular report. Other times, a report will meet the program's criteria for a site inspection by PPSP staff or a cooperating agency. Elements of the site inspection can include

- Environmental pesticide sampling
- Site evaluation
- Contacts with pesticide product manufacturers or equipment manufacturers
- Additional interviews
- Referrals and interagency coordination for additional follow-up and investigation

- Final case review for completeness of data and collection of any additional missing data, if feasible
- Regulatory action, if warranted, and/or recommendations for prevention

Case closure and classification involve:

- Evaluating whether information about the case is complete
- Assigning the case a classification category based on the standardized case definition
- Feedback to the reporter, HCP(s), affected person(s), and the worksite if appropriate
- Determining if the case warrants further efforts in terms of preventive intervention and dissemination of information

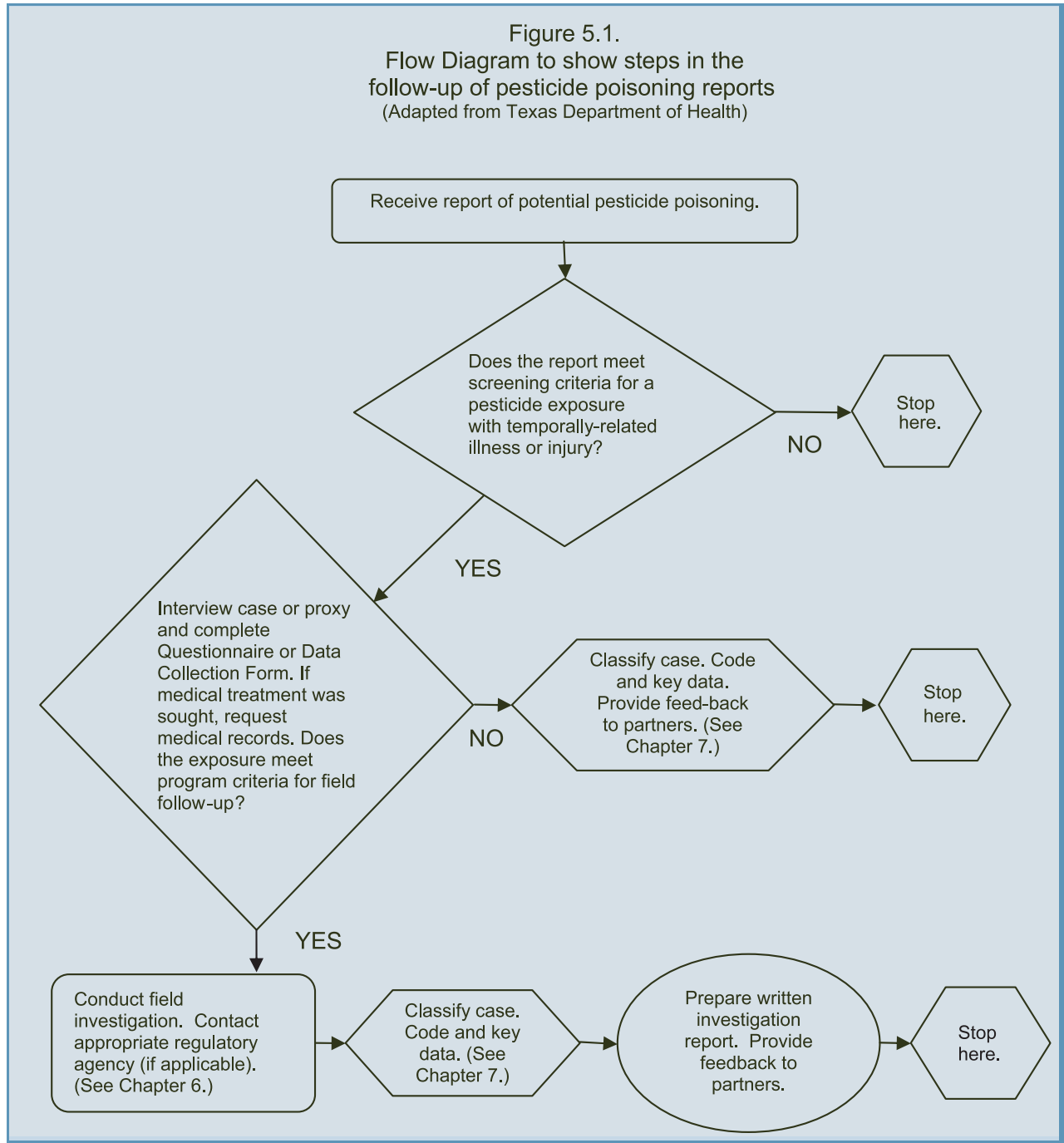
Note: Closure and classification may be provisional if a long time lag is expected for the final regulatory disposition of the investigation.

This chapter covers the case follow-up process. Site inspection, case closure, and classification are covered in subsequent chapters. The exact order of these steps may vary according to program protocols and the availability of information. A flow diagram of the case investigation process, similar to the example shown in Figure 5.1, can be helpful for program staff, and for explaining the process to partner agencies and the public.

5.3 INITIAL REPORT INTAKE (COMPLAINT EVALUATION)

This step in report management includes the collection of basic information about the affected person to determine whether the report meets criteria for additional investigation. This stage

Figure 5.1.
Flow Diagram to show steps in the
follow-up of pesticide poisoning reports
(Adapted from Texas Department of Health)



may include follow-up with the informant to determine if a pesticide exposure occurred and if temporally-related health effects developed. Depending on the source of the report, basic demographic and exposure information may be received in writing, by telephone, or in electronic format. Initial screening and intake may be conducted by support staff as long as a structured format is followed. The program administrator needs to determine if the program should log and track informational calls and/or reports that are screened out as unrelated to pesticide exposure. Collection of this information requires more work, but it provides a good measure of both service provided to the public and program workload. The step-wise procedures for logging in and assigning cases should be documented in a procedure manual. (A sample tracking form is included in Appendix C.) If multiple staff members are involved in case investigations, it is helpful for these staff to meet daily to ensure that individual reports that are part of a large exposure event are not being evaluated as separate events. Also, a weekly meeting to thoroughly review ongoing investigations will help provide structure to investigations, develop consistent program procedures, and prioritize investigations.

Simple questions asked during an initial report intake will help determine whether the person may have been exposed to a pesticide as defined by PPSP. These questions may seem so obvious that there is a risk they will not be asked for fear of insulting the person reporting the potential case. For example, early screening may exclude case reports by asking if symptoms began before the exposure of concern. The temporal relationship between pesticide exposure and symptom onset is critical.

Rapid identification of the chemical involved will allow staff to determine whether the chemicals

fall within those covered by the PPSP. For example, a report may involve exposure to a disinfectant and these exposures might be excluded from the particular surveillance system. (Note: If a State does not collect these cases, the person can still be referred to the EPA product manager for the particular product. See Appendix G for information about databases that include product information and EPA contacts.) Other exposures that may be excluded from the PPSP are fertilizers, fire retardants, cleaning agents, and other nonpesticides.

It is always important to ask where the person was relative to the site of the suspect application about which they are concerned (e.g., did they actually see the plane or helicopter spraying versus just hear it in the area). This type of information may allow rapid screening of the call to determine what level of investigation is needed. For example, it is often possible to determine whether an aerial application was being conducted in the vicinity by making a few telephone calls, and if so, where it was done and what chemical was applied.

5.4 CASE FOLLOW-UP INTERVIEWS

Interviews of affected persons should be as structured as possible to ensure that all pertinent information is collected in an efficient and consistent manner. Interviews may be done by telephone or in person. PPSPs should use a structured questionnaire or data collection form for all cases. Appendix C contains examples. Interviews of affected persons can be time-consuming. Staff should be trained to allow persons some time to voice concerns about their exposure but to control the interview and obtain the information needed to evaluate the exposure and illness. The interview should conclude with the interviewer summarizing the key

data elements with the interviewee to be sure the interviewer has an accurate understanding of the events surrounding the exposure.

The person, HCP, or agency reporting illness should always be asked if there are additional affected persons. The PPSP may ask the index case or sentinel provider for contact information about other affected persons, or ask to have them contact the PPSP directly. This is important to ensure that all exposed ill persons are decontaminated and obtain needed medical care, as well as to ascertain the magnitude of the exposure incident. Cases may also be identified retrospectively and linked to a single exposure event by searching some of the data sources described earlier in Chapter 3. The procedures for following up on other affected persons may be governed by State rules about medical confidentiality. The level of effort expended to find additional cases must be weighed against the severity of illness, the likelihood of ongoing exposure, and the measures required to protect the confidentiality of the index case. Events that occur either in an unstable work environment (e.g., farmworker crew exposures) or involve a combination of public and worker exposures (e.g., retail establishments) require a prompt site evaluation to efficiently obtain information about additional cases beyond the index case. More stable workplaces can be followed up through telephone interviews.

5.4.1 AFFECTED PERSONS

The affected person should be interviewed, whenever possible. The only exceptions are when the exposure is reported to be an intentional self-exposure (these interviews can be sensitive and are likely to produce little useful information) or the person is a minor. Interviews of minors should be conducted only with the permission of the parent or guardian.

The main purposes of these interviews are to

- Elicit information about the pesticide exposure and resulting illness or injury.
- Determine what factors caused the exposure.
- Provide information to help prevent ongoing or future exposures.
- Obtain HCP contact information if care was sought and this is a self-report.
- Ascertain if others are at risk.

PPSP staff should be aware that some nonoccupational case reports might involve pesticides exposures resulting from child neglect or abuse. The program should have guidelines for evaluating these situations and ensuring that appropriate agency referrals are made and properly documented.

It is important that PPSP staff be sensitive to concerns affected persons may have about possible repercussions from an investigation of their exposure. Renters may fear loss of housing if there is an investigation of a pesticide application made by a property owner. All occupational exposures may bring concerns about job loss. Immigrant workers may have additional concerns about immigration status and language difficulties understanding the investigation process.

Follow-up can be difficult if affected persons cannot be contacted by telephone. In-person interviews with such affected persons may be reasonable if the PPSP has regionally located field staff trained to investigate cases (affiliated with the State or local health department), or has a contractual relationship with locally based interviewers.

Note: If biological specimens are collected as part of the case investigation process, care must

be taken to fully inform the affected persons what the specimens will be tested for and who will receive the results. This is particularly important since persons may be concerned that blood or urine specimens might be tested for drugs and alcohol, and that results could be given to employers or police.

When interviewing migrant workers, keep in mind that they might not remain in the area for an extended period. Those who are ill or injured may choose to leave the area and return to their stable home base for medical treatment; indeed, they are sometimes encouraged to leave by their employer or coworkers. It is helpful to get a permanent address for the migrant worker in order to inform them of the investigation results. Interviews involving occupational exposures should include evaluating the potential for take-home exposures (e.g., ask if the exposed person removes contaminated clothes and washes contaminated skin before returning home).

When interviewers are trained, it is important to emphasize issues of cultural sensitivity as well as proper techniques to avoid introducing bias into the interview process. These issues should also be considered when developing questionnaires. Many social science texts are available that contain guidance on interviewing techniques. One such text with an in-depth discussion of interviewing and the use of questionnaires from an anthropologic/ethnographic perspective is *Research Methods in Anthropology: Qualitative and Quantitative Approaches*, 3rd edition [Bernard 1995], particularly Chapter 9 “Unstructured and Semistructured Interviewing” and Chapter 10 “Structured Interviewing: Questionnaires.” For a brief overview of epidemiologic issues associated with interviewing, see Hartge and Cahill [1998]. Appendix B of the Federal Insecticide Fungicide and Rodenticide Act (FIFRA) Inspection Manual also contains useful guidance on interviewing techniques [EPA 2002]. Since migrant farmworkers may

feel more vulnerable because of concerns about job loss and deportation, resources on applicable cultural issues (including a link to a bibliography on farmworker living and working conditions) are provided in Appendix G.

When investigating a cluster of illnesses at a fixed worksite, school, residential institution, or a situation involving an exposed group of agricultural field workers, interview as many of the exposed persons as feasible. This will help to determine the range of symptoms, circumstances associated with symptoms, and circumstances that may have protected asymptomatic persons. If exposed persons received emergency decontamination or were transported to an emergency care facility, the investigator should also determine whether any of the emergency care providers were exposed and became symptomatic. If so, these persons should be included in case follow-up.

Be aware that some reports of pesticide-related illness may involve exposures and illnesses among large groups where the illnesses are ongoing and the source of exposure is unclear. (For example, a non-agricultural workplace receives routine pesticide applications, is located near an agricultural operation, and a group of persons report ongoing or sporadic illnesses that are not associated with a specific pesticide application.) The investigative approach may be similar to that used in other noninfectious disease clusters. For instance, protocols for evaluation of indoor air complaints are particularly useful for these types of investigations [EPA/NIOSH 1991]. Staff should also be familiar with literature on epidemic psychogenic illness and ensure that the investigation process does not negatively influence the dynamic among the exposed persons [Alexander and Fedoruk 1986; Guidotti et al. 1987; Cole et al. 1990]. In some situations, it is useful to examine the incidence of symptoms in a control pop-

ulation of similar demographics. This approach has been used when investigating illness in school children and staff [Heumann 2000].

Particular care must be taken to accurately record identifying information when investigating clusters of illness among farmworkers or school children. Hyphenated last names and multiple names found in some cultures may result in duplicate cases, especially when the names are presented in differing orders. Also note that with hyphenated names, sometimes only one name will be recorded. Careful collection of name, age, date of birth, and addresses will help to avoid duplicate entry of cases reported from multiple sources.

5.4.1.1 CHEMICALLY SENSITIVE PERSONS

Chemically sensitive persons may ask the PPSP for recommendations to prevent pesticide exposure. In some States (e.g., Florida, Louisiana, and Washington), the DA maintains a registry of residents who require notification before pesticide applications are made near their homes. To be placed on the registry in Florida, a person must provide a note from his or her physician and must pay an initial registration fee and an annual renewal fee. Those on the registry are notified at least 24 hours before any relevant pesticide application in the vicinity of their property. Notification can be made by telephone, mail, hand delivery, or in person. The Florida statute appears at: <http://www.flsenate.gov/welcome/index.cfm> (see Title XXXII, Chapter 482, Section 2267). Given that these registries can help chemically sensitive persons avoid potential pesticide exposures, it is recommended that the PPSP determine if their State has such a registry. In States without a registry, some chemically sensitive persons have established pre-notification agreements. Pre-notification agreements are informal and involve a request

to neighbors to provide sufficient notification before application of any relevant pesticides.

PPSPs will occasionally receive reports from chemically sensitive persons who claim they were poisoned by pesticides. If such a claim is for a substantial exposure, the person's complaint to the State DA may result in an investigation. These investigations often include sample collection to determine the presence of residual pesticide, which if detected may cause the DA to take action against the pesticide applicator (e.g., verbal or written warning for a first violation). Involvement of the DA can help to favorably change the behavior of the pesticide applicator, whether a neighbor or commercial operation.

5.4.2 HCPs

A telephone report received from an HCP's office can provide more information than a written or electronic report. However, a telephone report may be incomplete if the person is still symptomatic or undergoing testing and/or treatment. If the patient is still present at a clinician's office when the report is made, you have an excellent opportunity to provide assistance to the HCP, such as tracking down information about the pesticide product.

For reports received after the person's symptoms have resolved, follow-up interviews with HCPs should generally be made only when a review of medical records does not provide critical information needed to classify a case. During HCP follow-up interviews, provide opportunities for the clinician to ask questions or to provide insight into the patient's exposure. These interviews should be kept as brief as possible and be organized so repeated contacts will not be needed. follow-up calls can be irritating in a busy clinical setting, especially if they are

caused by disorganized data collection. Before conducting a follow-up interview, be sure to highlight all questions with missing information on the data collection form (or questionnaire) to help ensure that you obtain all of the information needed. PPSP staff responsible for contacting HCPs should be trained in medical terminology and have access to reference materials on standard diagnostic tests.

Migrant and seasonal farmworkers are mobile and may not be easily accessible by telephone for follow-up. Clinics that serve this patient population should therefore be encouraged to report suspected cases while the patient is still in the office. It is equally important to have bilingual/bicultural staff or to contract with interviewers familiar with the worker populations in your area.

Most programs routinely obtain medical records of reported cases. Some States have indicated that having the medical record request signed by a health department physician is more likely to yield medical records than when letters are signed by staff who are not physicians. To protect patient confidentiality, information obtained from a medical record review must be carefully guarded to ensure it is not released to other agencies cooperating on an incident investigation.

5.4.3 THIRD PARTIES-PESTICIDE APPLICATORS, LANDLORDS, AND EMPLOYERS

Interviews with or written requests to third parties for information are commonly part of the case follow-up process. Third parties can include employers, pesticide applicators, and landlords, especially in the event of agricultural exposures involving drift or spray from aerial applications. An exposure scenario might involve several employers; for example, the

employer of the pesticide applicator, another employer who contracted for a pesticide application, a third employer whose workers in a nearby field were subjected to drift, and possibly a labor contractor who is the actual employer of the exposed workers. Although third parties may not be legally required to cooperate with an investigation, they usually do.

Third-party interviews are often critical in determining exactly what pesticide the affected person was exposed to as well as additional factors that may have influenced the exposure. The employer or applicator can supply information about anything unusual about the application. The applicator should also be able to supply information about application equipment and methods, product dilution, mixtures of products, and any *adjuvants* added. When investigating illness in a crew of field workers or a stationary workplace, the employer should also be able to supply names and contact information of the exposed or potentially exposed workers.

If staff conducting interviews and site inspections have limited first-hand knowledge of particular types of pesticide applications, training them for interviewing pesticide applicators can be helpful. This could include simulated interviews of volunteer applicators using an unscripted case scenario to familiarize the interviewer with important information—namely, correct terminology, what the application equipment looks like, and what might go wrong with an application. It is helpful to ask these volunteer applicators about past problems they experienced or observed. Their responses and “war stories” can provide some clues for areas to home in on during an investigation. It is best if the interview is conducted at a site where the applicator has access to equipment and record-keeping forms to help familiarize the interviewer with these items. Members of the PPSP advisory committee (see Section 5.9.3) representing various sectors

of the pesticide industry may be able to assist with identification of volunteer applicators for this interview process.

It is important for staff to be carefully trained to protect the confidentiality of affected persons to the extent possible. There are clearly times when complete anonymity of the affected person is not possible, especially when dealing with a small workplace or investigation of an application to a residence. If a person is suffering from mild illness and is likely to be easily identified if questions are asked (e.g., he is the only pesticide handler at the workplace), the PPSP must determine if obtaining the third-party information is critical. In these situations, it is important to gain the permission of the ill worker before contacting the employer. Staff should be familiar with protections against discharge and employment discrimination provided to workers by provisions of the Occupational Safety and Health Act [29 CFR[‡] 1903.11c] (OSH Act) and other State regulations.

5.5 NOTIFICATION OF THE LOCAL HEALTH DEPARTMENT

The relationship between the agency housing PPSP and the local health departments varies by State. In general, the minimum level of notification is that all cases received at the State level are reported within 24 hours to the local health department, and a brief final summary is provided when the investigation is complete. If reports involve multiple persons or a broader public exposure, the contact should usually be more in-depth.

In a number of States, local health department staff are trained to conduct pesticide illness

investigations and may take the lead in some case investigations. Local health departments may become involved in investigations involving large numbers of exposed persons, and clusters where the cause of an illness cluster is unclear after a preliminary investigation. Even if local health department staff do not conduct full investigations (interviewing clinicians, exposed persons, etc.), they can be valuable members of the investigation team by collecting and transporting samples.

5.6 OBTAINING PESTICIDE PRODUCT INFORMATION

Ideally, the exposed person, treating HCP, or another informant will be able to give the PPSP a product name and EPA registration number. More commonly, substantial sleuthing may be required to obtain this information. It is important to try to get both the product name and EPA registration number since some products with the same or very similar names have very different formulations. Each product has a unique EPA registration number, and this can be used to differentiate products with the same name. If the exposed person is not the person who applied the pesticide, the pesticide applicator will need to be contacted by the PPSP or a partner agency depending on the program protocols to obtain pesticide product information.

The SPIDER database, POISINDEX[®], EPA PPIS database, and the PANNA Web sites are all good starting points to find information about a pesticide product's active ingredients. Links to some of these sites, and commercial sites for product labels and material safety data sheets (MSDSs) are provided in Appendix G. Note that these databases generally only contain information about active ingredients in the pesticide formulation (that is, those chemicals added for the purpose of their pesticidal activity) and not about inert ingredients.

[‡]*Code of Federal Regulations*. See CFR in references.

5.6.1 INERT INGREDIENTS

Pesticide products may contain ingredients that are considered inert as defined by FIFRA. Inert ingredients are not included in the formulation for their pesticidal properties (although they may possess such activity). In 1987, the EPA developed a policy to “reduce the potential for adverse effects from the use of pesticide products containing toxic inert ingredients” [52 CFR 13305]. As part of this policy, inert ingredients were categorized into four lists based on hazard and priority for testing. All of the inerts on List 1 (categorized as chemicals of toxicological concern) must be listed on the product label (see Table 5.1). This categorization is based on carcinogenicity, neurologic effects, developmental and reproductive effects, or adverse ecological effects. Some pesticide products voluntarily indicate on the product label the identity of inerts or other ingredients not on List 1. The use of the term *inert* is accepted, although EPA now encourages registrants to use the term *other ingredient* rather than *inert* [EPA 1997]. This policy change is a result of EPA’s efforts to make the language on pesticide product labels clearer for consumers. (See <http://www.epa.gov/opptintr/labeling/> for information about the Consumer Labeling Initiative.)

List 2 provides the 95 chemicals currently used in pesticide products that are considered potentially toxic. These ingredients are undergoing review to determine whether they should be moved to List 1 or List 4, described below. This determination will be based on an assessment of carcinogenicity, neurologic effects, developmental and reproductive effects, or adverse ecological effects.

List 3 contains inert ingredient chemicals of unknown toxicity that are undergoing assessment. List 4 is composed of two lists: List 4A are minimal risk inert ingredients and List 4B are those inert ingredients that the EPA has

determined to pose no adverse risks to the environment or public health when used in pesticide products. *Note:* Lists 2, 3, and 4 are not included here because of their length and more frequent updating compared with List 1. New inert ingredients are occasionally added to the lists, and the EPA issues periodic notices of reclassification for chemicals that have undergone review. Lists 2, 3, and 4 and additional information about inert ingredients appear at <http://www.epa.gov/oppr001/inerts/>. This Web site also has links to Federal Register notices that list inert ingredients removed from all lists but which may be found in older products associated with exposure incidents.

Regrettably, product-specific information about inert ingredients is not readily available to the public or public health professionals in any database. Several lawsuits have been filed in an attempt to require disclosure of inert ingredients on the product label, but the disclosure is currently voluntary except for inerts on EPA’s List 1. The inert ingredients are considered *Confidential Business Information* protected under the trade secrecy provision of FIFRA. Product MSDSs may contain some information about inert ingredients. If a PPSP suspects that

Table 5.1. List 1: Inerts of toxicologic concern—currently used in pesticide products.

Chemical Name	CAS Number
1,4-Benzendiol	123–31–9
Diethylhexylphthalate	117–81–7
Diocetyl adipate	103–23–1
Ethylene glycol monoethyl ether	110–80–5
Isophorone	78–59–1
Nonylphenol	25154–52–3
Phenol	108–95–2

an inert ingredient may be implicated in an illness or injury, the product manufacturer or the local PCC should be contacted to obtain information about that ingredient. Contacting the manufacturer or the local PCC is usually faster than trying to obtain the information from the EPA. Always ask to speak with a manufacturer's toxicologist or physician when requesting this information. You may need to submit a request via fax to confirm the public health need for the information. Registrants are required to provide information about inert ingredients to HCPs involved in the evaluation of an exposed person. For links to manufacturer and MSDS Web sites, see Appendix G. Keep in mind that additional carriers or *adjuvants* that might have adverse toxicologic effects may be added by the pesticide applicator. These carriers and *adjuvants* are not registered as pesticides, although they are designed to be mixed with pesticide products. Information about carriers and *adjuvants* is available from some of the sources listed in Appendix G. The NPIC Web site (<http://npic.orst.edu/manuf.htm>) is an additional good source of contact information for manufacturers.

In the event that inert ingredient information is not available from either the manufacturer or the local PCC, this information can be provided by the EPA [40 CFR 2.307]. Currently, this requires the health department to place a request on its letterhead (or the letterhead of another government agency with responsibilities for protecting public health) and fax it to the Assistant Administrator of EPA's Office of Prevention, Pesticides, and Toxic Substances. The fax number is 202-564-0801.

Inert ingredients are more of an exposure concern for particular product formulation types. Use of aerosol products can result in exposure to active and inert ingredients due to the small droplets dispensed by the pressurized product.

The inert solvents and propellents in aerosol products can be hazardous. Liquid formulations (emulsifiable concentrates, soluble concentrates, liquids, ultralow-volume concentrates, and solutions) are of greatest concern. The inert ingredients can include oils, solvents, or alcohols, and concentrated (as opposed to ready-to-use) formulations may contain high levels of active ingredients. Some liquid formulations may contain antifreeze to prevent freezing in storage.

Pesticide dusts are composed of finely ground pesticide mixed with a dry inert such as ground clay, talc, or chalk, which functions as a carrier. These products pose an inhalation hazard, but the inert ingredients are usually less hazardous. The inert of greatest concern here is usually silica. Granular and pellet formulations typically contain lower amounts of active ingredient bound to a larger particulate inert carrier such as ground vegetable material (e.g., corn cob, nut shell), sand, or clay.

5.7 EVALUATION AND REFERRAL FOR SITE INSPECTION OR ENFORCEMENT

The enforcement agency that receives inspection referrals varies across States and circumstances. Most often it is the DA; less often the State occupational health agency, department of forestry, or department of environmental protection. In most instances, the PPSP cannot conduct an investigation or evaluation without having some contact with enforcement agencies. Each PPSP must make its own decisions about referral protocols for investigation by these agencies. The PPSP should consider several issues including confidentiality concerns, whether other persons are at risk, whether the exposure is ongoing, the severity of the illness

or injury, and whether circumstances suggest possible rule violations. There should be a system for documenting and tracking referrals to determine the outcome of investigations by the partner agencies, and to ensure that findings are disseminated to the appropriate persons and agencies. It is helpful to have written protocols that describe the priority system and process for referral.

When the PPSP makes a referral, a person's name is not usually released unless the person has agreed to the release or agrees to contact the enforcement agency him- or herself. Case intake forms should have a place to indicate if verbal permission has been given to release sufficient information for a referral, and whether this includes permission to release the person's name. PPSP must develop guidelines on when a written release is required. This issue is usually of greatest concern for occupational exposures where workers are concerned about loss of employment, and nonoccupational exposures where tenants are concerned about loss of housing.

The PPSP must decide under what circumstances a referral is made to an enforcement agency without the permission of the affected person. Exposed workers may be reluctant to have the PPSP contact their employer or make a referral to an enforcement agency. When deciding how to proceed in these situations, the PPSP must take into account whether others are at risk, the nature of the exposure, and the severity of the illness or injury. Affected persons should be informed both of their rights about confidentiality, and that some enforcement agencies may be less able to protect confidential information compared with the PPSP.

5.8 OVERVIEW OF AGENCIES WITH JURISDICTION OF PESTICIDES

This section outlines the principal agencies typically involved in regulating pesticide manufacturing, distribution, use, and disposal at the State level. As the many entries suggest, a great deal of variability exists in how individual States manage oversight of pesticide use. There is no uniform way that Federal rules are incorporated into State laws/rules, nor is there consistency in the State agencies designated to implement or enforce these laws/rules. (Appendix F provides an overview of the main Federal rules that relate to pesticide use and potential exposures.)

5.8.1 FIFRA STATE DESIGNEES

The key agency for enforcing most of the rules mandated by FIFRA varies from State to State. In most States, the DA functions as the EPA designee for enforcement of FIFRA. In others, the department of environmental conservation, or other similar agency holds that responsibility. The areas covered by FIFRA include the registration of pesticide products, product labeling, licensing of pesticide applicators, the sale and distribution of pesticides, and proper work practices for handling pesticides. Rules on the disposal of pesticides are usually enforced by the State environmental agency, which will also be involved in responding to spill events or events involving pesticide contamination of bodies of water.

The part of FIFRA governing proper agricultural work practices is WPS, the provisions of which are usually enforced by the same State

agency that enforces FIFRA. Formal agreements designate the primary State agency responsible for WPS enforcement. Oregon is currently the only State to delegate WPS enforcement to a State OSHA program, by agreement with the Oregon DA. In Washington State, both the DA and the Department of Labor and Industries simultaneously adopted identical WPS rules based on EPA standards. A detailed description of FIFRA is included in Appendix F.

5.8.2 OSHA

Twenty-six States/territories operate their own OSHA program. In most of them, the OSHA program is a part of the DOL, but in others it may be part of the insurance division, health department, or other section of the State government. The groups of workers covered varies among the different State and territorial programs. For more information about State programs, see <http://www.osha.gov/fso/osp/index.html>. In States without their own OSHA program, the Federal OSHA is responsible for regulating occupational safety and health. Federal OSHA maintains one or more regional offices in these other States.

The Federal Occupational Safety and Health Act contains provisions that relate to pesticide exposure, including hazard communication, farm labor housing, field sanitation, agriculture, fumigants, first aid and emergency services, and general duty clauses about provision of a safe and healthy workplace. OSHA also has responsibility for workers involved in manufacturing and formulating pesticides.

State level OSHA programs may have broader jurisdiction over occupational health issues related to pesticides. PPSP staff should seek training and information from OSHA staff in their State about State rules and agency jurisdiction in this area.

5.8.3 AGENCIES RESPONSIBLE FOR DISEASE SURVEILLANCE AND CONTROL

Responsibility for surveillance of both environmental and occupational pesticide-related illness and injury may be in the same office within an agency, or they may be scattered in different State agencies and offices. The simplest situation is one in which they occupy a single office within an agency. This allows development of protocols that encompass occupational and nonoccupational exposures. In addition, single exposure events that involve occupational and nonoccupational cases can be managed by the same staff. If the two types of cases (that is, occupational and nonoccupational) are managed in different offices within the same agency, a central point of contact for all cases is usually easiest for reporters. This central contact should have well-structured referral and follow-up procedures.

Many States participate in a centralized system established for reporting chemical spills and releases, called the Hazardous Substances Emergency Events Surveillance (HSEES) system. Funding to develop and maintain HSEES is provided by the Agency for Toxic Substances and Disease Registry (ATSDR). The PPSP should make sure it is linked to any HSEES activities in its State, and receives reports of events involving human exposures to pesticides.

5.8.4 OTHER STATE AND ADJUNCT AGENCIES

Other agencies that may be involved in case investigations include the State agencies responsible for the following:

- Environmental regulation (that is, the PPSP is usually involved with these agencies when an event includes issues related to dis-

posal, transport, spills, or other significant environmental contamination, or releases into bodies of water, air, or soil),

- Forestry (that is, when an event involves applications to State forest lands), and
- Fish and wildlife (that is, when an event includes harm to fish or wildlife).

5.8.4.1 VECTOR CONTROL DISTRICTS

Vector control districts are responsible for control of disease vectors at the county or regional level. They provide public education to help control breeding of rodents, mosquitoes, flies, and ticks. They also conduct pesticide applications to control disease vectors and nuisance problems caused by the vectors. It is helpful to have a list of the local districts and information about what pesticide products they are using. This will allow the PPSP to contact the appropriate district upon receipt of illness reports that are associated with vector control activities. The American Mosquito Control Association's Web site (www.mosquito.org) has links to affiliated mosquito and vector control associations.

5.8.4.2 PEST CONTROL BOARDS

Some States have governing bodies involved in the regulation of nonagricultural commercial pesticide applications, such as applications by structural pest control operators. These bodies can be helpful in case reporting, investigating, and developing intervention strategies.

5.9 STATE INTERAGENCY COORDINATION OF CASE INVESTIGATIONS

Outlining the most effective structure for interagency coordination is extremely difficult because the level of cooperation, available

resources, and expertise across State agencies is not standard. This section discusses several of the different approaches used to address interagency coordination. At a minimum, it is important to know which agencies in the State have responsibility for the various issues associated with pesticide incidents and to have a list of the appropriate contacts in each of those agencies.

5.9.1 INTERAGENCY AGREEMENTS

Washington and Texas PPSPs each maintain a memorandum of understanding between State agencies for investigation of pesticide poisoning cases. The agreements set forth formal arrangements among State agencies about communication, responsibilities, and jurisdiction for investigation of pesticide-related health complaints. Formal interagency agreements can be time-consuming to negotiate and may end up with rigid clauses that do not provide sufficient flexibility to address all situations that may occur. Nevertheless, they are helpful in clearly stating roles and responsibilities of agencies and setting a clear structure for cooperation. The existence of formal agreements also sets a precedent for documented cooperation that is easier to maintain over time as agency management and personnel change.

5.9.2 MULTIAGENCY COORDINATING BOARDS

Two States (Oregon and Washington) have created multiagency boards to establish mechanisms for coordinating investigations, evaluating data from investigations, and developing action plans for pesticide poisoning prevention. These boards are designed specifically to address adverse human and environmental impacts from pesticide use and are briefly described below. Web site addresses for the statutory language establishing

the two programs are provided in Appendix B. States interested in pursuing development of similar boards are advised to contact the Oregon Pesticide Analytical and Response Center (PARC) and Washington Pesticide Incident Reporting and Tracking Review Panel (PIRT) to obtain annual reports and other information about these programs.

PARC was established in the early 1970s in response to public concerns about the health effects from herbicide spraying conducted by the forestry industry. The board is composed of representatives from seven State agencies with jurisdiction over pesticides or health, a representative from the Oregon Poison Center, and one citizen appointed by the governor. Various toxicologists within the State university system are included as consultants to the board. PARC is designed to centralize reporting of actual or alleged health and environmental incidents involving pesticides. It is also designed to mobilize the expertise needed to investigate pesticide incidents in a timely manner. The board examines data to identify trends and problems, and may make recommendations for actions to member agencies. The budget for PARC was eliminated in 2003, but agency members continue to meet on a regular basis to discuss investigations and review cases. The Washington PIRT panel was modeled on the PARC board but has somewhat broader mandates.

5.9.3 ADVISORY COMMITTEES

If a PPSP does not develop formal interagency agreements and there is no statutorily mandated multiagency oversight committee (or board) to address pesticide use, the program might benefit from developing an advisory committee. Members of the advisory committee can include representatives from other partner agencies, public interest groups (e.g., environ-

mental and public health organizations), agricultural employers, worker advocacy groups, PCCs, HCP associations, pesticide manufacturers or reformulators with facilities in the State, and the pest control industry. The committee should meet two to four times per year. The meetings are often a source of valuable ideas to the program. They also provide the PPSP an opportunity to maintain contact with various constituencies, apprise them of findings, develop joint programs for outreach and intervention, and discuss mechanisms for improving reporting and investigation.

5.10 NIOSH, NCEH, AND EPA

Prompt notification of NIOSH, NCEH (for nonoccupational cases only), and EPA may allow those agencies to work with the State PPSP to prevent additional cases. Guidelines used to trigger NIOSH/NCEH/EPA reporting are case reports that involve any of the following:

- hospitalization or death from unintentional pesticide exposure, or
- events that involve 4 or more ill persons, or
- events that occur despite use according to the pesticide label, or
- events that indicate the presence of a recurrent problem at a particular workplace and/or with a particular employer's worksites.

Prompt sharing of information with Federal partner agencies alerts them to possible emerging problems and may trigger additional investigative action and assistance to the PPSP. NIOSH may be notified by contacting the Surveillance Branch, Division of Surveillance, Hazard Evaluations and Field Studies at 1-800-356-4674. NCEH may be notified by contacting the Health Studies Branch at 404-498-1340. Notification of EPA

can include contacting both the EPA Regional Office (see Appendix G) and the Health Effects Division of EPA in Washington, D.C. (703-305-7576 or 703-305-5336). Ideally, notification between the EPA Regional Office and the PPSP should be reciprocal (that is, the PPSP should be notified by EPA when EPA learns of events within the PPSP's area of jurisdiction). The EPA Regional Office typically will refer complaints or reports to the State designee (that is, the State agriculture department). Establishing routine contact between programs will make reciprocal notification more likely. NIOSH and EPA may also assist in mobilizing the resources of other agencies as needed (e.g., to investigate the illegal residential use of methyl parathion in several States, the EPA regional offices solicited assistance from NCEH and ATSDR [EPA 1996]).

5.11 FEDERAL AGENCIES THAT MAY HAVE A ROLE OR BE A RESOURCE DURING CASE INVESTIGATION

This section describes those Federal agencies with which the PPSP will likely have the greatest contact.

5.11.1 UNITED STATES DEPARTMENT OF AGRICULTURE (USDA)

Several USDA programs can serve as useful information resources or as partners in educational programs. The primary programs pertinent to pesticide illness surveillance are as follows:

- Cooperative State Research Education and Extension System
- Federal Grain Inspection Service
- Animal Plant Health Inspection Service (APHIS)

5.11.1.1 COOPERATIVE STATE RESEARCH EDUCATION AND EXTENSION SYSTEM (CSREES)

CSREES is a national system based in the land grant universities and county administrative units. This system is well recognized in rural communities, and increasingly in urban areas, as a source of information and practical classes. The system maintains agricultural experiment stations that work with university researchers, including toxicologists. Programs include (1) IPM, (2) sustainable agriculture, (3) food safety, (5) family health, (6) 4-H clubs, and (7) environmental and water quality programs. The EXTOWNET system is a resource on pesticide and environmental toxicology sponsored through CSREES. Local extension agents provide information about crops, seasonal pesticide use, and particular pest problems in local areas. They can be valuable resources in understanding local agricultural issues. The extension agents usually specialize in particular crops and may be a valuable resource in determining what products are typically used and can identify the local aerial applicators. The extension service works with EPA and State designees to conduct pesticide applicator training programs. The extension service also offers programs aimed at youth (e.g., 4-H), farm families, and suburban gardeners. These established training programs can be ideal avenues to disseminate pesticide safety information from the PPSP. The extension programs also can be ideal partners for developing and testing interventions. (More information about extension programs appears in Appendix G.)

5.11.1.2 FEDERAL GRAIN INSPECTION SERVICE (FGIS)

FGIS is part of USDA Grain Inspection, Packers, and Stockyards Administration. It establishes the methods and standards used to describe grain quality. FGIS or delegated State

agencies conduct mandatory export grain inspections and other nonmandatory programs for domestic grain commerce. PPSPs will usually not have much contact with this branch of USDA unless addressing fumigant exposures to FGIS grain inspectors, or to the public from treated grain or vehicles (railcars, barges, etc., used to transport grain).

5.11.1.3 ANIMAL PLANT HEALTH INSPECTION SERVICE (APHIS)

APHIS is responsible for conducting activities aimed at protecting agriculture in the United States. These activities include securing the U.S. borders against foreign agricultural pests and diseases, as well as facilitating exports of agricultural products. It is also involved with preventing damage to agriculture from wildlife (including through the use of pesticides). Additionally, APHIS is involved in ensuring the safety of genetically engineered plants and other agricultural biotechnology products. At the State level, APHIS works with State departments of agriculture and health when planning emergency actions associated with elimination of foreign pests. Recent examples of these types of activities include programs to eradicate medfly and citrus canker in Florida, medfly in California, and Asian or European Gypsy Moth in many States. It is important that PPSP programs work closely with DA and APHIS contacts on these types of eradication programs. These eradication programs may require significant levels of public education and outreach activities aimed at HCPs and the public prior to a pest control operation taking place. It is extremely important for the various agencies involved in emergency actions to present the same risk communication message since differing messages can weaken public trust and understanding. If the infestation is a regional problem, activities may be coordinated with other States in the region.

When addressing these eradication programs, the PPSP may choose to add a more active component to its routine passive surveillance. There also may be reasons for conducting a more structured epidemiologic study to address particular concerns. This might include controlled studies of applicators, or monitoring emergency room reports for particular illnesses of concern and comparing illness rates with background levels [Green et al. 1990; Pearce et al. 2002]. The volume of calls can increase significantly surrounding these types of spray programs, resulting in a considerable increase in workload. During these events, PPSPs frequently set up hotline operations to deal with complaints and questions. In addition, agency Web sites can serve as valuable sources of information for the public. Fact sheets and up-to-date spray schedules and maps can be posted and updated as frequently as needed in response to changing conditions (for an example, see the New York State Department of Health Web page on West Nile Virus at <http://www.health.state.ny.us/nysdoh/west-nile/index.htm>).

5.11.2 FEDERAL AVIATION ADMINISTRATION (FAA), NATIONAL TRANSPORTATION SAFETY BOARD

The agency that investigates airplane accidents can provide information about airplane accidents involving aerial pesticide applications. Reports on investigations are available on the agency Web site (see Appendix C for the address and instructions on conducting a search).

5.11.3 U.S. FISH AND WILDLIFE

This agency has responsibilities for protection of wildlife and may be involved in investigations of wildlife poisoning. They and their State partner agencies may work with the PPSP on analyses to determine whether pesticides are

implicated in wildlife deaths that may also involve potential human exposures. The agency is also active in issues associated with pesticide use and the Endangered Species Act.

5.11.4 OTHER FEDERAL AGENCIES

A number of other Federal agencies, along with their State counterparts, can be helpful during some investigations. These agencies will be discussed briefly because PPSPs will only periodically collaborate with them.

5.11.4.1 COAST GUARD

The Coast Guard will play a role in addressing exposure incidents involving spills in navigable waterways.

5.11.4.2 CONSUMER PRODUCT SAFETY COMMISSION (CPSC)

The CPSC may be a useful partner when addressing issues associated with imported products, such as insecticidal chalk.

5.11.4.3 CUSTOMS BUREAU

The Customs Bureau should be notified when information is obtained about importation of illegal pesticides (that is, pesticides not registered for use in the United States).

5.11.4.4 DEPARTMENT OF TRANSPORTATION (DOT)

DOT plays a role in the regulation of interstate shipping of pesticides and may be a useful contact for exposure incidents involving a shipping accident or spill.

5.11.4.5 FEDERAL BUREAU OF INVESTIGATION (FBI)

The FBI should be consulted when PPSP suspects malicious use of pesticides, and the malicious use has potential community or broad public impact.

5.11.4.6 FEDERAL RAILWAY ADMINISTRATION

The Federal Railway Administration may be involved in situations involving rolling stock (that is, rail cars anywhere other than in rail yards or depots that are under OSHA jurisdiction). They will also have a role in addressing releases of pesticides being transported by rail.

5.11.4.7 FOOD AND DRUG ADMINISTRATION (FDA)

The FDA may be involved with investigations involving veterinary or pharmaceutical uses of pesticides, and genetically modified crops with pesticidal properties.