Washington State Department of Health
Pesticide Program: Illness Monitoring and Prevention
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Hazards of home foggers and aerosol insecticides: Observations and Recommendations

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In Washington State, acute pesticide-related illness is a reportable condition. Health care providers who see patients with possible illness due to pesticide exposure, must report these cases to the Washington Department of Health (WDOH) directly or through the WA Poison Center. Reports are also received from Worker's Compensation claims, local health jurisdictions, other state agencies, and from individuals. The program does not track intentional harm (e.g., suicide or homicide) or incidents involving disinfectants. Annually, the program investigates 250-300 case reports. Data gathered during follow-up investigations is used to identify: 1) trends in poisoning and other injuries, 2) problem pesticide products or applications methods, and 3) causal factors underlying the accidental pesticide exposure. This information is used to target prevention efforts. More information is available in the attached brochure.

In 2007, WDOH and the WA State Department of Agriculture (WSDA) communicated to EPA about our general and growing concern over total release foggers and other aerosol formulations. The EPA Office of Pesticide Program responded that they would appreciate more specific information regarding product labels. To provide this, we reviewed 2005 - 2006 data for illnesses and injuries related to household foggers and aerosols. We restricted the review to non-occupational cases which were determined to be plausibly related to pesticide exposure.

Section A contains WDOH general observations and findings. Section B highlights three cases to underscore potential seriousness of adverse reactions and the importance of adding label warnings. Section C contains our specific recommendations to improve safety of fogger and aerosol pesticides. Appendix 1 contains the causal factors spread sheets with individual cases described and specific products identified. Appendix 2 contains an example of fogger label language that could lead to overuse.

Section A – Observations from Illness/Injury Surveillance (2005-2006)

Data review of 2005 and 2006 non-occupational cases involving foggers and home use aerosol insecticides showed a total of 66 incidents involving 70 people. These were cases reported to the WDOH, primarily through the WA Poison Center and investigated by WDOH staff. Most of these cases sought health care at a clinic or hospital emergency room. Two persons were hospitalized; one died.

The review included only cases of illness and injury determined to be "Definitely", "Probably" or "Possibly" related to pesticide exposure. These classifications were established by National Institutes of Occupational Safety and Health (NIOSH) for standardized surveillance of pesticide-related illness. Details on this coding scheme are available at http://www.cdc.gov/niosh/topics/pesticides/.

Below is a summary of the incidents and causal factors attributed to the incidents during case investigation by WDOH. Tracking and analyses of causal factors is supported by a grant from NIOSH to "Identify Preventable Causes of Pesticide Related Illness."

Total Release Foggers (19 incidents, 22 ill/injured people-cases)

Causal factors documented (numbers of cases):

a. Label use instructions not followed (13 cases):
    - Over-use of foggers for the area treated (8).
    - Did not leave area (4): user went into another room and shut door.
    - Other (3):did not remove pet, paid no attention to nozzle direction, used fogger as aerosol to spot spray.
b. Re-entry exposures (6 cases):
    - Early re-entry (4).
    - Followed or exceeded re-entry time and still became sick (2). Unsure whether they followed ventilation instructions.
c. Stored within reach of children (5 cases):
    - One incident (4 people): toddler pulled off counter and activated.
    - Developmentally delayed teenager found can and activated.
d. Accidental activation, couldn't turn off (2 cases):
    - Can malfunctioned and activated.
    - Side tab came off and can activated.
e. Products involved:
    - Raid Concentrated Deep Reach Fogger (15/22 cases – 64%). Contains cypermethrin.
    - Other Raid foggers (2), Hotshot foggers (2) Hartz, Real Kill, Unknown (1 each). Contain permethrin and tetramethrin.
    - WA does not require pesticide use reporting and has no market share information on the foggers associated with cases. Lacking this data we cannot determine whether Raid Concentrated Deep Reach Fogger has a higher relative risk or just a larger market share.

Aerosols/ pressurized sprays (47 incidents, 48 cases - people ill or injured)

Causal factors documented (number of cases):

a. Label use instructions not followed (13 cases):
    - Spraying overhead with can tilted so it dripped down arm (3).
    - Sprayed in continuous spray, not short bursts as directed (2).
    - Restricted use product used by homeowner (2).
    - Overzealous spraying (2).
    - Nozzle was pointed toward applicator when pushed button (1).
    - Sprayed on self thinking it was repellent (1).
    - User did not clear area of people for 15 min as directed (1).
b. Early re-entry and ventilation issues (4 cases):
    - Did not wait 2 hours after PCO finished (1).
    - Did not ventilate structure after treatment (3).
c. Improper storage (within reach of children) (11 cases):
    - Toddler found can and sprayed (5).
    - Incidents in retail environment (2): toddler sprayed brother in aisle (product was on low shelf), stocker sprayed when opening damaged box.
    - Children applying unsupervised (2).
    - Can fell from temporary storage (2).
d. Accidents (3 cases):
    - Spray bounced off surface and back into applicator (2).
    - Readjusting front seat in car and punctured can in the back (1).
e. No obvious label violations identified but person still became ill or injured (17 cases). These are listed in Table 1 below.

Table 1
Eighteen cases of illness/injury involving aerosols or pressurized liquids in which all label directions were apparently followed.
(2005-2006, WDOH Pesticide Illness Surveillance)

Caption	Causal factors	Causal Factor code*	Causal factor comment	Pesticide	EPA Reg. No.	Active Ingredients
Daughter exposed when mother sprayed spiders in same room	Toddler was in bedroom when mother sprayed can of Raid. Could not identify specific Raid product to see if label was clear about avoiding people.	2	Mother sprayed can of Raid without first removing young child. Child got some spray in face.	RAID AEROSOL - UNSPECIFIED		
Toddler with CNS symptoms after an aerosol was used in house.	Young child allowed tobe in kitchen during spraying with aerosol insecticides. Child found dazed and semi-conscious in next room after grandmother finished spraying.	13	Label has no caution about allowing children nearby or about inhalation hazard.	RAID ANT & ROACH 17	00482200447	Imiprothrin, Cypermethrin
Man had eye exposure at home while spraying insecticide	Accidental eye exposure, eye PPE not required. Wearing his regular glasses.	8	Spraying aerosol outside when a couple drops got in his eye.	SPECTRACIDE BUG STOP INSECT KILLER	00482200229	Pyrethrins; Piperonyl butoxide; Permethrin, mixed cis,trans (ANSI)
Homeowner sprayed rug and furniture for fleas	Used aerosol product to heavily spray rugs and furniture in house. Did not open windows and doors but did work outside for about 3 hours immediately after. Symptom onset when she returned to sprayed area and sat on couch. No PPE required by label	3	Label states "ventilate enclosed areas before returning" but this appears to refer to the application for flying insects when you close the windows and doors and fill room with mist.	RAID HOUSE AND GARDEN BUG KILLER FORMULA 7	00482200283	Allethrin, d-; Phenothrin, D-

Caption	Causal factors	Causal Factor code*	Causal factor comment	Pesticide	EPA Reg. No.	Active Ingredients
Office worker ill after insecticide applied indoors	Multiple spraying for ants in small office. May have over-applied. Office has a false ceiling and roof soffets are only ventilation.	3	Reoccupied office 6 days after last spray. Odor was still very strong according to worker.	POWERHOUSE ANT AND ROACH KILLER	00102101701	Esfenvalerate
Woman reacted to smell of room treatment	Management applied aerosol product in home. She returned 7 hours after application and noticed chemical odor. Symptom onset was shortly thereafter.	3	Label states “leave treated area for one hour, then ventilate before reoccupation.” Unsure whether any ventilation took place.	ULD BP-100 INSECTICIDE	00049900452	Pyrethrins; Piperonyl butoxide; Octyl bicycloheptene dicarboximide, N-
Employee set off numerous foggers in truck for roaches, developed symptoms	Truck was used to haul rental furniture and apparently had hauled roach infested load. Wore no PPE while applying 2 cans aerosol and 3-4 bombs within 5 min.	13	Aerosol cans had no warning about applying in enclosed spaces.	RAID ANT & ROACH 17	482200447	Imiprothrin, Cypermethrin
				REAL-KILL INDOOR FLEA FOGGER	00102101623	Permethrin, mixed cis,trans (ANSI); Pyriproxyfen; Octyl bicycloheptene dicarboximide, N-

Caption	Causal factors	Causal Factor code*	Causal factor comment	Pesticide	EPA Reg. No.	Active Ingredients
Elderly man developed rash after using RTU insecticide	He sprayed bed and carpets throughout house, and showered immediately after. There may have been some inhalation and skin contact during application. Developed whole body allergic skin reaction.	13	No PPE was required. No language about not using as surface spray.	BAYER ADVANCED HOME-HOME PEST CONTROL INDOOR & OUTDOOR INSECT KILLER,	312500530	Cyfluthrin
Woman sprayed her feet when spraying cat for fleas	Some aerosol spray got on bare feet while spraying her cat. Feet started itching almost immediately.	13	Label required no PPE, no precautions about avoiding skin exposure	SERGEANTS RESIDUAL FLEA & TICK SPRAY II	251700071	Permethrin, mixed cis,trans (ANSI); Pyrethrins
Woman walked through mosquito spray	Individual did not follow directions for mosquitoes exactly. Product was supposed to be used on surfaces where mosquitoes rest. This user continuously sprayed the product while walking through the spray mist.	13	No health warnings about use as space spray on rest of label.	HOT SHOT SPIDER KILLER PLUS	00968800125	Tralomethrin (ANSI); D-trans allethrin

Caption	Causal factors	**Causal Factor code***	**Causal factor comment**	Pesticide	EPA Reg. No.	Active Ingredients
Man overused spray then slept on bedding	He read label. Cautions against inhalation or contact with direct spray but nothing about limit to amount of spraying. Label says OK to spray on bedding but not on sheets or pillowcases. He sprayed his bedding only.	13	Overused lice spray. Sprayed 5 whole cans in 7 days. Label is silent on repeated use.	RID Lice spray (could not confirm EPA #)		Permethrin, mixed cis,trans (ANSI)
Woman ill after spraying for beetles in her home	Individual may have been sensitive to pyrethroid compounds. No warning on label about possible sensitivity.	13	She applied to baseboards as directed. Allergy type symptoms immediately.	#271 RAID ROACH & ANT KILLER AND TREATMENT	00482200271	Permethrin, mixed cis,trans (ANSI); Tetramethrin (ANSI)
Man inhaled wasp & bee spray	Sprayed for 45 -60 min around perimeter of house with aerosol wasp killer. Spraying above head. Recalls breathing in spray. Respiratory symptoms lasted weeks.	13	No PPE requirements on label or any warnings about respiratory hazard if inhaled	CHEMSICO WASP & HORNET KILLER T	00968800117	Tralomethrin (ANSI); D-trans allethrin
Symptoms after spraying pets with flea & tick spray	She applied spray to pets and got some on her hands. Washed hands. Possible mild symptoms the next day.	13	No PPE required on label	HARTZ 2 IN 1 FLEA & TICK PUMP FOR DOGS II	00259600125	Tetrachlorvinphos

Caption	Causal factors	Causal Factor code*	Causal factor comment	Pesticide	EPA Reg. No.	Active Ingredients
Homeowner ill after spraying pesticides	Using product to kill wasps when the stream of pesticide bounced off wall and sprayed back in her face. She was wearing regular prescription glasses but the splash went around sides and into eye.	13	No PPE label requirements for using this product. MSDS does recommend eye PPE	RAID WASP & HORNET KILLER 271	0482200271	Tetramethrin (ANSI); Permethrin, mixed cis,trans (ANSI)
Adult male developed rash after treating his roses	This case reports he handled plants the day following an application to the roses. After handling with bare hands he rubbed his face to remove sweat. He did not wash face that evening. Allergic reaction on face next day. History of skin sensitivity.	13	No label language about dermal contact with treated surfaces.	ORTHO SYSTEMIC ROSE & FLORAL SPRAY	00023902476	Resmethrin (ANSI); Acephate (ANSI); Triforine (ANSI)
Adult female experienced respiratory symptoms after work place sprayed	Maintenance staff sprayed product they considered to be low hazard in nursing home. No time when people aren't in facility. Worker walked by room right after spraying and smelled odor. Individual may have been sensitive, no one else with symptoms.	13	No label language about airing out room before reentry	TOTAL SOLUTIONS CIK	01008800092	Tetramethrin (ANSI); Permethrin, mixed cis,trans (ANSI); Piperonyl butoxide

*Causal Factor codes help WDOH summarize common preventable factors associated with cases. Causal factor codes mentioned in this table are: 2) People were exposed in the treated area during application, 3) Structure not adequately ventilated before allowing people to re-enter, 8) Spill or splash (not involving equipment failure) and 13) No label violation identified but person still became exposed/ill.

Section B: Case reports supporting more prominent label warnings about potential adverse reactions.

Case 1: 2005 (050156)

- Case classification = Definite
- Severity of medical outcome = Moderate
- Non-occupational exposure
- Product: Raid House and Garden Bug Killer Formula 7; EPA Reg. No. 4822-283
- Ingredients *(per MSDS for product)*: phenothrin 0.096%, D-cis trans allethrin 0.239%, isobutane and isoparaffinic hydrocarbon solvent (3-7% each), propane and butane (5-10% each), sodium nitrite 0.1%, water.

On 6/3 a 52 y/o male sprayed aerosol insecticide for flies inside his car and closed the windows. He also sprayed his house with the same product. Respiratory and systemic symptoms began that day. Symptoms worsened when he returned to the car around noon on 6/4 and drove into town without first ventilating the car. He has condition of chronic respiratory compromise and was recovering from bronchitis. He was referred to medical care by the WA Poison Center but because of life circumstances, did not seek health care for 4 days. He was hospitalized for 3 days for acute exacerbation of asthma.

Case 2: 2006 (060082)

- Case classification = Probable
- Severity of medical outcome = Low/mild
- Non-occupational exposure
- Product: Raid Ant and Roach 17; EPA Reg. No. 4822-447
- Ingredients *(per MSDS for product)*: imiprothrin (0.1%), cypermethrin (0.1%), isopropanol (1-5%), hydrocarbon propellant blend (10-20%), isoparaffinic hydrocarbon solvent (20-30%), water (50-70%).

An 18 month old boy was found in the living room with neurological symptoms shortly after his grandmother sprayed an aerosol insecticide in the kitchen for 20 min. The toddler had been sitting on the floor of the kitchen while the grandmother sprayed into kitchen cupboards for ants. He was described as dazed, stumbling, and acting intoxicated and was taken by family to urgent care. He was given oxygen and his symptoms improved rapidly. The child was released and had no further symptoms. MD felt his symptoms were due to exposure to solvents in the aerosol.

Case 3: 2006 (060159)

- Case classification = Possible
- Severity of medical outcome = Death
- Non-occupational exposure

- Product: Enforcer Instant Knockdown Wasp & Hornet Killer; EPA Reg. No. 40849-77
- Ingredients *(per MSDS for product)*: Permethrin (0.25%), Tetramethrin (0.1%), piperonyl butoxide (0.50%) isoparaffinic solvent (>95%).

A 64 y/o female sprayed aerosol insecticide along the outside eaves of her home in the evening. Her husband reported that the liquid ran down her arms has she held the can above her head. She swept the can back and forth as she sprayed. After spraying she wiped off her arm and had dinner. That night she reported difficulty breathing. In the morning she called 911 with shortness of breath. When medics arrived, she was found unresponsive in respiratory arrest and transported to the hospital. She did not recover at the hospital and died nine days later. Diagnosis was respiratory failure secondary to exacerbation of Chronic Obstructive Pulmonary Disease (COPD). Several national experts in pesticide-related illness reviewed the case and felt that her symptoms were consistent with a delayed asthma reaction. Investigation also documented that the weather was hot (~100 F) and may have contributed to exacerbation of COPD.

Section C: Specific recommendations for improving labels and packaging

1. Request that EPA consult their confidential production and sales information to see whether the high frequency of Raid Concentrated Deep Reach Fogger (EPA Reg no. 4822-452) is explained by market share.

2. If market share does not explain the frequency of cases, request that EPA investigate possible reasons for increased risk with this product (e.g., higher percentage of cypermethrin in this concentrated product (1.716%), large volume of space treated by each can (7,000 cu ft) results in common overuse).

3. For all foggers:
   - Reduce fogger package size so that each treats only 1000 ft (10x12x8ft room). Some foggers treat up to 10,000 cu ft. This leads to dramatic overuse when people use one per room. For example, Real Kill Indoor Fogger 5 (EPA Reg no. 9688-249-478) treats up to 6000 cu ft but the label directions state only "DO NOT use more than one fogger per room" and "Do not use in a room 5 ft x 5ft or smaller; instead, allow fog to enter from other rooms." Placing one can in an average 10 x 10 ft bedroom would apply 7.5 times the necessary amount. Placing a can in a 5 ft x 8 ft bathroom would apply almost 19 times the necessary amount (label provided in Appendix 2).
   - Add a packaging device to allow manual deactivation of fogger if accidentally activated. Ensure that such a device permanently disables the fogger to prevent intentional partial use of cans.
   - Add a visual cue like a red ring around the release hole. Some users are assuming that the spray comes out the side like an aerosol.

- Safety proof the activation button so children cannot activate (e.g., twist the cap to line up arrows with the body of the can). Ship and stock all cans with the arrows in lock position.
- Improve label language which states "leave treated area." This is often misunderstood to mean leave the treated room. This does not provide adequate respiratory protection, especially for sensitive individuals. Consider "Leave the premises."
- Make warning statements more prominent. People do not seem to understand that foggers can make them ill or pose life threatening reaction for asthmatics and other individuals with respiratory impairment. Consider adding:
    - "Breathing fog can make you and your pets sick – leave premises immediately after activating, wait 4 hours, then open windows and ventilate the area before reoccupying."
    - "Breathing this product may trigger breathing difficulty in asthmatics and others with respiratory conditions. Keep sensitive people away from treated area until fully ventilated."

4. For aerosol insecticides:
    - Add a warning to remove children from room before spraying aerosol.
    - Add warnings about respiratory symptoms in sensitive subpopulations (i.e., people with asthma, Chronic Obstructive Pulmonary Disease, Reactive Airways Disease, or other respiratory impairments). "Breathing this product may trigger breathing difficulty in asthmatics and others with respiratory conditions. Keep sensitive people away from treated area until fully ventilated."
    - Add a childproof device to prevent accidental spraying.
    - Add a visual arrow on the top of the can pointing to the direction of spray release. Users are pressing the button when the nozzle is pointed at their face.
    - Review Table 1 for possible improvements on specific label such as adding PPE requirements, improving re-entry and ventilation instructions, and cautioning users about spraying aerosols repeatedly or in enclosed spaces.

5. Encourage EPA to support efforts to educate consumers about alternatives to foggers and aerosol insecticides for the control of fleas, cockroaches, ants, and flying insects. This is especially important for individuals who are at increased risk of adverse health effects.

Washington State Department of Health
Pesticide Program: Illness Monitoring and Prevention
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Addendum to July 18, 2008 report on
Hazards of total release foggers

Data review of WDOH pesticide illness investigations showed that numbers of plausible fogger-related illnesses and injuries doubled in 2007 relative to 2005 and 2006. Data from 2005-2007 showed 47 cases involving total release foggers (TRF). The most common health problems reported by cases were respiratory, neurologic and gastrointestinal. Although most of the illnesses identified by WDOH were low in clinical severity, they did involve medical care from ambulance medics, hospital emergency departments, or doctor's office. WDOH cases were reported primarily through the WA Poison Center. During this same three year period, WA Poison Center received an additional 209 calls reporting fogger exposure and subsequent symptoms for which no health care was sought. These 209 cases do not meet investigation criteria at WDOH and are not represented in the analysis below. It is clear from the larger poison center numbers that the true incidence of problems related to TRFs is higher than WDOH data would indicate.

The WDOH review included only cases of illness and injury determined to be "Definitely," "Probably," or "Possibly" related to pesticide exposure. These classifications were established by National Institutes of Occupational Safety and Health (NIOSH) for standardized surveillance of pesticide-related illness. Details on this coding scheme are available at http://www.cdc.gov/niosh/topics/pesticides/.

Below is a summary of contributing factors noted during case investigation by WDOH. We routinely inquire about exactly how and why the incident occurred and record contributing factors for our internal use in prevention efforts. A spread sheet with specific factors coded for 2007 TRF cases is attached to update Appendix 1, Table 2 in our earlier mailing. Tracking and analyses of contributing factors is supported by a grant from NIOSH to "Identify Preventable Causes of Pesticide Related Illness."

2005-2007 illnesses associated with TRFs (38 incidents, 47 ill/injured people-cases)

Contributing factors documented (numbers of cases):

B. Label use instructions not followed (30 cases):

- Over-use of foggers for the area treated based on the cubic feet each can treats (21).
- Did not leave area (5): user went into another room and shut door.
- Other (7): did not remove pet, paid no attention to nozzle direction, used fogger as aerosol to spot spray, left food or dishes out, activated fogger too close to pilot light.

C. Re-entry exposures (10 cases):
    - Early re-entry (8).
    - Followed or exceeded re-entry time and still became sick. Unsure whether they followed ventilation instructions (2).

D. Stored within reach of children (10 cases):
    - Three incidents (each involving 2-4 people): young child found and activated fogger thus exposing family members.
    - Developmentally delayed teenager found can and activated.

E. Accidental activation/ malfunction (3 cases):
    - Can malfunctioned and activated.
    - Side tab came off and can activated.
    - "Spent" fogger, sprayed person when he took out trash.

F. Products involved:
    - Raid Concentrated Deep Reach Fogger (25/47 cases – 53%). Contains concentrated cypermethrin.
    - WA does not require pesticide use reporting and has no market share information on the foggers associated with cases. Lacking this data we cannot determine whether Raid Concentrated Deep Reach Fogger has a higher relative risk or just a larger market share.

Case ID	Caption	Prevention Text	Causal factor code #1**	Causal factor code #1 - comment	Causal factor code #2**	Causal factor code #2 - comment	Total release fogger involved
070002 A	Mother and 2 children exposed to bug bomb accidentally set off by child.	Young child activated fogger when can was left within her reach at home. Can discharged in small apartment.	9	4 year old set it off.			Raid Concentrated Deep Reach Fogger (EPA Reg # 4822-452)
070002 B	Mother and 2 children exposed to bug bomb accidentally set off by child.	Young child activated fogger when can was left within her reach at home. Can discharged in small apartment.	9	4 year old set it off.			Raid Concentrated Deep Reach Fogger (EPA Reg # 4822-452)
070002 C	Mother and 2 children exposed to bug bomb accidentally set off by child.	Young child activated fogger when can was left within her reach at home. Can discharged in small apartment. History of asthma may have exacerbated reaction.	9	4 year old set it off.			Raid Concentrated Deep Reach Fogger (EPA Reg # 4822-452)
070017	Homeowner exposed to bug bomb in trash can.	Unclear exactly what happened. Fogger had been used in his home earlier and he disposed of can when finished. When he opened trash bag later, however he received some spray in his face. Can may have been defective?	14	Can should not have sprayed out again after the fogger was spent.			Hot Shot No-Mess Fogger (EPA Reg # 9688-159)
070030 A	Three exposed when child found and activated fogger.	Products normally kept out of reach were accessible as the family packed up their things to move out. Child thought it was perfume.	9	Family in moving process, child found fogger in bathroom (out of normal place).			Raid Concentrated Deep Reach Fogger (EPA Reg # 4822-452)
070030 B	Three exposed when child found and activated fogger.	Products normally kept out of reach were accessible as the family packed up their things to move out. Mother inhaled fumes when she went to help daughter.	9	Family in moving process, child found fogger in bathroom (out of normal place).			Raid Concentrated Deep Reach Fogger (EPA Reg # 4822-452)

Case ID	Caption	Prevention Text	Causal factor code #1**	Causal factor code #1 - comment	Causal factor code #2**	Causal factor code #2 - comment	Total release fogger involved
070039	Activated flea fogger sprayed women in the face.	Fogger was activated and set on a shoe box. The box was probably not sturdy enough.	8	Activated fogger fell off shoe box immediately after activation.			Sav-on Osco Roach and Flea Fogger (EPA Reg # 9688-119)
070041	Ingested cereal left unsealed during home fogging.	Lack of awareness of toxicity of product. 3 foggers used in 6400 cu ft apartment. Each fogger treats up to 6000 cu feet. Did follow label however and did not exceed 1 fogger/room.	12	Label directs users to remove or cover food, Cereal not covered.			Hot Shot Fogger 3 (EPA Reg # 478-126)
070069	Female tenant re-entered apts. 5 hrs after bug bomb released.	Excessive use of bug bombs - 3 set off in 8,000 cu ft apt. 1 bomb good for 5000 cu feet. She followed all other directions, waited 5 hrs before returning, opened windows and ventilated for 2 hrs. Vacuumed and wiped down surfaces.	12	Set off 3 bug bombs in 8000 cubic foot apt. Each bomb good for 5000 cubic feet.	17	She may be sensitive. Has asthma and chemical sensitivities.	Raid Concentrated Deep Reach Fogger (EPA Reg # 4822-452)
70116	Furniture mover exposed to bug bomb, had seizure same day.	Moving truck had been fogged fully loaded with stuff. When mover showed up to unload it, could smell strong smell.	3	Trailer not ventilated. Label directs users to ventilate for 30 minutes before re-entering.	12	Label says 1 can treats up to 5,000 cu ft. Used 3 cans in 6,600 cu ft. trailer.	Raid Concentrated Deep Reach Fogger (EPA Reg # 4822-452)
070199	Fogger exposure trying to find cat left behind.	Case used 2 foggers in single wide trailer (12 x 60) and inadequately prepared for fogging. Re-entered 4 times before he found and removed his cat. Attempted to minimize his exposure by entering for short durations and holding breath.	4	Entered shortly after activating foggers; needed to save pet. Total exposure was 10 min.			Raid Flea Killer Plus Fogger (EPA Reg # 4822-229)
070204	Respiratory irritation when fogger ignited, too close to gas water heater.	Activated bug bomb too close to gas hot water heater and it exploded.	12	Label warns to extinguish pilot lights. Apparently not done.			Raid Concentrated Deep Reach Fogger (EPA Reg # 4822-452)

Case ID	Caption	Prevention Text	Causal factor code #1**	Causal factor code #1 - comment	Causal factor code #2**	Causal factor code #2 - comment	Total release fogger involved
070212	Adult female entered home where fogger had been activated.	Entered her home to find bug bomb activated, not notified. Label states "keep building closed for 2 hrs before airing out."	1	Another member of house set it off. Didn't tell her.	4	Immediate respiratory reaction upon entering house.	Do-it-Best Indoor Fogger (EPA Reg # 1021-1648)
070223	Adult male has systemic symptoms after setting off bug bombs.	He was setting off 2 foggers in a 8 x 10 x 5 ft storage area in basement. He had trouble backing out of area since door had closed behind him. Breathed in fog while exiting room. One can malfunctioned and only dripped (not a causal factor in his symptoms).	12	One can treats up to 6,000 cu ft. He set off 2 cans (one malfunctioned) in 400 cu ft.			Schultz Home Fogger (EPA Reg # 9688-78)
070224	Tenant has symptoms after using multiple products for fleas.	Used 5 different products over 2 week period, incl. 3 bug bombs, exterior sprays and 2 kinds of flea drops on dog.	13	No label violations but she applied multiple products in short time period.			Enforcer Flea and Roach Killer (EPA Reg # 40849-35)
070228	Adult activated 9 foggers in home and became ill.	Over use of foggers. She put one per room. Also, drank from glass of water that had been left out. Ventilated for 30 minute per label instructions.	12	Used almost 7 times more fogger than needed. Used 9 foggers in 8000 cu ft home. Label states treats up to 6000 cu ft.	2	She suggested that foggers need activation delay. She was exposed to first foggers while activating rest.	Hartz Advanced Care 4 in 1 Fogger (EPA Reg # 1021-1623)
070232	Man taking shower when foggers activated by his son.	Moderate severity reaction after breathing foggers. Dad was not in direct rooms where foggers were activated but still inhaled fog. Label says leave treated area but is not clear about vacating premises.	2	Dad in shower when son released foggers in home.			Raid Concentrated Deep Reach Fogger (EPA Reg # 4822-452)
070234	Adult set off fogger in travel trailer and re-entered shortly after.	One can treats 3,840 cu feet. His trailer was about 672 cu feet. Not clear whether this is label violation since he did not use in room smaller than 5 x 5 per label.	4	Went back in travel trailer to retrieve cell phone shortly after discharging flea bomb.	12	Should have used a can that treated smaller space.	Raid Formula V (EPA Reg # 4822-229)

Case ID	Caption	Prevention Text	Causal factor code #1**	Causal factor code #1 - comment	Causal factor code #2**	Causal factor code #2 - comment	Total release fogger involved
070239 A	Family sick after overuse of foggers in home.	Use of 5 foggers in 11,000 cu ft home. Each can treated up to 6000 cu ft. Label doesn't appear violated as instructs "No more than 1 per room." Re-entry at 12 hrs to ventilate. Reoccupied at 24 hrs.	12	Used 3 times more than needed. Label doesn't appear violated since did not use more than 1 per room.			Hot Shot Fogger 3 (EPA Reg # 478-126)
070239 B	Family sick after overuse of foggers in home.	Patients words: never use foggers again. Suggested outreach materials be placed in pediatricians offices, in grocery stores, in items that parents buy for kids/babies.	12	Used 3 times more than needed. Label doesn't appear violated since did not use more than 1 per room.			Hot Shot Fogger 3 (EPA Reg # 478-126)
070239 C	Family sick after overuse of foggers in home.	Use of 5 foggers in 11,000 cu. ft. home. Each can treated up to 6000 cu feet. Label doesn't appear violated as instructs "No more than 1 per room." Re-entry at 12 hrs to ventilate. Reoccupied at 24 hrs.	12	Used 3 times more than needed. Label doesn't appear violated since did not use more than 1 per room.			Hot Shot Fogger 3 (EPA Reg # 478-126)
070239 D	Family sick after overuse of foggers in home.	Use of 5 foggers in 11,000 cu. ft. home. Each can treated up to 6000 cu feet. Label doesn't appear violated as instructs "No more than 1 per room." Re-entry at 12 hrs to ventilate. Reoccupied at 24 hrs.	12	Used 3 times more than needed. Label doesn't appear violated since did not use more than 1 per room.			Hot Shot Fogger 3 (EPA Reg # 478-126)
70269	Fireman has symptoms after entering home where 12-15 bug bombs had been activated.	Overuse of bug bombs triggered fire alarm at residence. Responding fire dept unaware of the hazard.	4	Fire dept. entered home only 1/2 hr after activation.	12	Overuse, 2-3 bug bombs would have been adequate for space. 11-15 were used.	Hot Shot Fogger 3 (EPA Reg # 478-126)

Case ID	Caption	Prevention Text	Causal factor code #1**	Causal factor code #1 - comment	Causal factor code #2**	Causal factor code #2 - comment	Total release fogger involved
070292	Adult goes to ER after fogging apartment with 4 bombs.	One can treats up to 5,000 cu ft. She did read the label but has poor eyesight, didn't see label guidance on number of foggers to use. She wished print were larger. Waited 4 hrs but had immediate symptoms upon re-entry.	12	Used at least 4 cans in small 2 bedroom apartment.			Raid Concentrated Deep Reach Fogger (EPA Reg # 4822-452)
070293	Adult drank from glass after apartment fogged.	Left dish out during insecticide fogging. Overuse: Used 3 foggers in 6000 cu ft home. One can treats up to 6000 cu ft.	12	Label states "Before you fog" cover food, dishes, and food prep equip.			Hot Shot Fogger 3 (EPA Reg# 478-126)

* DPP cases are documented illnesses or injuries that are classified as definitely, probably or possibly related to pesticide exposure upon DOH investigation. ** Causal Factor Codes are: 1) Posting or notification didn't occur; 2) People were in treated area during application; 3) Structure not adequately ventilated; 4) Early re-entry; 5) Required eye PPE not worn; 6) Other required PPE not worn; 7) PPE in poor repair, not maintained, not worn correctly; 8) Spill/Splash (not involving equip failure); 9) Product not stored properly; 10) Decontamination not adequate or timely; 11) Deliberate misuse of a pesticide; 12) Other label violations; 13) No label violations but person still became ill; 14) Equipment failure; 15) Drift; 16) Applicator not properly trained/supervised; 17) Other; 18) Unknown.