

GUIDELINE FOR PREVENTING CHILD PESTICIDE POISONINGS IN SOUTH AFRICA

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Acronyms

COEHR	Centre for Occupational and Environmental Health Research
CoCT	City of Cape Town
DAFF	Department of Agriculture, Forestry and Fisheries (previously DoA)
DANIDA	Danish International Development Agency
DEAT	Department of Environmental Affairs
DNA	Designated National Authority for the Rotterdam Convention
EHP	Environmental Health Practitioner
NDoH	National Department of Health
NGO	Non-Governmental Organisation
OP	Organophosphate
PIC	Prior Informed Consent (Rotterdam Convention)
RXH	Children's War Memorial Red Cross Hospital
UCT	University of Cape Town



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1. INTRODUCTION AND BACKGROUND

Pesticides, all substances or mixtures of substances for preventing, destroying, repelling or mitigating any pest (e.g., herbicides, insecticides, rodenticides, fungicides), are heavily used in South Africa. Pesticide use does not only occur in agriculture, but also domestically, in public places (e.g., schools, crèches, hotels, hospitals, pavements) and in public health vector control (e.g., lice shampoos, indoor use for malaria control), to name a few. All pesticides are toxic although they vary in their degree of toxicity. Children are most vulnerable and are at risk of high exposures. However, children presented with pesticide poisoning symptoms often are undiagnosed. Thus in this guidance document, the intention is to promote better diagnosis, treatment and prevention of child pesticide poisonings.

The particular concern about children's exposure to pesticides is that in contrast to adults, children and infants are uniquely and disproportionately vulnerable to pesticide poisonings (Table 1), and the resulting acute and chronic health effects. Thus, it is critically important to protect children from pesticide exposures, as well as the unknown and known health effects such as birth defects (Heeren et al. 2003; NRC 1993), asthma (Salam et al. 2003), neurological effects (Weiss et al. 2004), hormone disruption effects (Landrigan et al. 2003; Colborn 1993) and cancer (Zahm and Ward 1998).

Children have proportionately more exposure to pesticides than adults, because in relation to body weight children drink more water, eat more food and breathe more air (Landrigan 2001). Children also have more hand-to-mouth behaviour than adults, increasing their ingestion of pesticides. Furthermore, children play close to the ground more than adults increasing their absorption of pesticides and inhalation of pesticides in low-lying layers of air. Children, in addition, have a larger skin surface area relative to their body weight in comparison to adults. Given that the majority of pesticides are easily absorbed through the skin, a child, for a given quantity of skin exposure to a pesticide, would incur a larger dose relative to body weight than that of an adult with the same exposure (National Research Council 1993).

Furthermore, children grow rapidly and are still undergoing organ development, so their developmental processes are vulnerable to disruption. Additionally, since children have more future years than adults, there is more time for children to accumulate exposure and to develop chronic diseases triggered from exposures early in life (Landrigan 2001).

Table 1: Factors Placing Children at Increased Risk for Pesticide Toxicity

PHYSIOLOGIC	BEHAVIOURAL	BIOLOGICAL
Rapid metabolism leads to increased consumption, which leads to	Hand-to-mouth behaviour increases ingestion of pesticides in dust and soil.	Immature metabolic pathways are less able to detoxify and excrete certain toxins as adults may.

disproportionately heavier exposures to toxins in water, food, and air in comparison to adults.	Playing close to the ground increases exposure to pesticides in dust, soil, carpets, and low-lying layers of air.	Rapidly maturing developmental processes are easily disrupted.
		More future years of life allows more time for the development of chronic diseases caused by early pesticide exposures.

Source: Adapted from: National Research Council (1993) *Pesticides in the Diets of Infants and Children*. Washington, D.C.: National Academy Press.

In South Africa it is not uncommon for people living in poor urban communities to purchase pesticides from street sellers located in taxi ranks or local markets (Fig 1), in order to rid their homes of the pests that are frequently associated with over-crowding, poor refuse collection and poor sanitation. They purchase these pesticides, as opposed to commercial domestic insecticides, because they are inexpensive and highly accessible. These highly toxic chemicals are intended for agricultural use, but instead are decanted into smaller containers and used by people in their homes. They usually do not come with directions for use, and the people who use them do not have adequate protection when applying them. They are often sprayed directly onto household surfaces or mixed with other food and used as bait for pests. Table 2 illustrates this.

Many children are adversely affected by these pesticides because they have lower body weights and more undeveloped immune systems than adults. Furthermore, they are often unaware of the fact that something toxic has been sprayed or mixed in with the food that is used as bait. This puts them at risk for coming into contact with pesticides and subsequent poisoning. Specifically, it has been documented that the child victims can end up with asthma, neurological defects, birth defects, hormone disruption defects, and cancer when poisoned by street pesticides. Poisonings by all agricultural pesticides, including organophosphates (OPs), carbamates, pyrethroids, anticoagulants, and naphthalene are considered to be a medically notifiable condition. Unfortunately, these types of poisonings are under-reported.

Children Admitted to a Western Cape Hospital with Suspected Pesticide Poisoning April 2008-April 2009	
Total no. of children	N=54
Males	25 (56%)
Females	28 (52%)
Age	
✦ 1-12 Months	11 (20%)
✦ 1-2 Years	18 (33%)
✦ 2-4 Years	12 (22%)
✦ 4-10Years	11 (20%)
✦ 10+ Years	2 (4%)
Cases from Khayelitsha	16 (30%)
No. Hospitalized (1-10 days)	39 (72%)
No. of cases where use of street pesticides is suspected	36 (67%)
No of cases notified to Dept. of Health	14 (26%)

Table 2. Child Poisoning Cases investigated by the COEHR (Rother 2009)

This is why the Centre for Occupational & Environmental Health Research (COEHR) at the University of Cape Town (UCT) has undertaken a project to investigate whether or not children are exposed to pesticides, and if they are exposed, are they poisoned (See Table

2). This research is conducted by taking narratives from the children and families that have been victims of poisonings. It aims to identify the pesticides that are poisoning the children and find out whether or not they were sold by street sellers.



Figure 1: Common drink bottles used for street pesticides

2. PURPOSE/RATIONALE OF GUIDELINE

Based on the COEHR's research findings, a brief guideline document has been produced to address Poor Urban Children's Pesticide Exposures and to improve the current Pesticide Poisoning Notification Process. The intention is that this document will provide guidelines and be a reference document for poison information centres, health care workers, EHP's and nurses on:

- notification processes for children poisoned by pesticides
- cases of poor urban children poisoned by pesticides
- treatment of child poisonings
- health and safety issues for children exposed to pesticides, recommendations for preventing exposures, and suggestions for improving surveillance and monitoring of child poisonings

3. AIMS AND OBJECTIVES

This guideline **aims** to be a reference document which provides information to health professionals and others who deal with child pesticide poisoning cases (i.e. those aged 0-18). This guideline focuses on children because of their higher risk and vulnerability from and to pesticide exposures. However some of the principles could also be applied to adults. Although not all aspects of the guideline may apply to all users of this document, the intention is that the guideline becomes a relevant reference document for those people who require more in depth information on child pesticide poisonings.

Objectives

The **objectives** of this guidance document are:

- 1) To provide relevant information for those dealing with child pesticide poisonings in order to:
 - a. Promote accurate and fast treatment of acute pesticide poisoning cases through prompt and accurate recognition
 - b. Promote better capturing of information about acute poisoning cases by health professionals
 - c. Promote improved distribution of poisoning information to the relevant stakeholders (e.g., municipal health departments, provincial health departments, national department of health) so as to improve on notifying pesticide poisonings
- 2) To be a resource document which is regularly up-dated.
- 3) To promote risk reduction and prevention of child pesticide poisonings.

Target Audience

This document is meant to be accessible to and a resource document for a broad range of health professionals who in one way or another come into contact with or work with children poisoned by pesticides. There is a **primary target audience** and **secondary target audience** for this guidance document.

Primary Target Audience:

- Environmental Health Practitioner's (EHPs)
- Public and Private Sector Physicians
- Poison Information Centres
- Nurses
- Clinics

Secondary Target Audience:

- Medical Students
- Health Promoters
- Emergency Personnel
- Researchers
- Social Workers
- Other inspectorates
- Non-Governmental Organisations (NGO's)

4. GUIDING PRINCIPLES FOR MANAGING CHILD PESTICIDE POISONING

Key to managing child pesticide poisonings is accurate diagnosis of cases, notification, treatment and prevention. Each of these is discussed in detail in the sections that follow. Health professionals are responsible for ensuring that each of these principles is adhered to and the appropriate actions carried out. In practice no single person is responsible for the process from beginning to end, but instead responsibility is handed over a number of times, often causing breakdown. The NDoH needs to reassess who is responsible for each step of the process and whether this system could be approved upon so that responsibility is not shared among many individuals. For example at RXH, a physician/registrar would diagnose a poisoned child, treat the child and indicate in the case file that the poisoning needs to be reported. Then a sister tasked with notifications would complete the form and send it to the City of Cape Town. An EHP is then contacted to follow-up on the case, fill out a report form and give instruction on prevention. The follow-up report is then sent to the province who in turn sends the notification and follow-up report to the National Department of Health (NDoH), and the follow-up report to The Department of Agriculture, Forestry and Fisheries (DAFF) – Pesticide Registrar and the Department of Environment Affairs (DEAT) – Rotterdam Convention Designated National Authority.

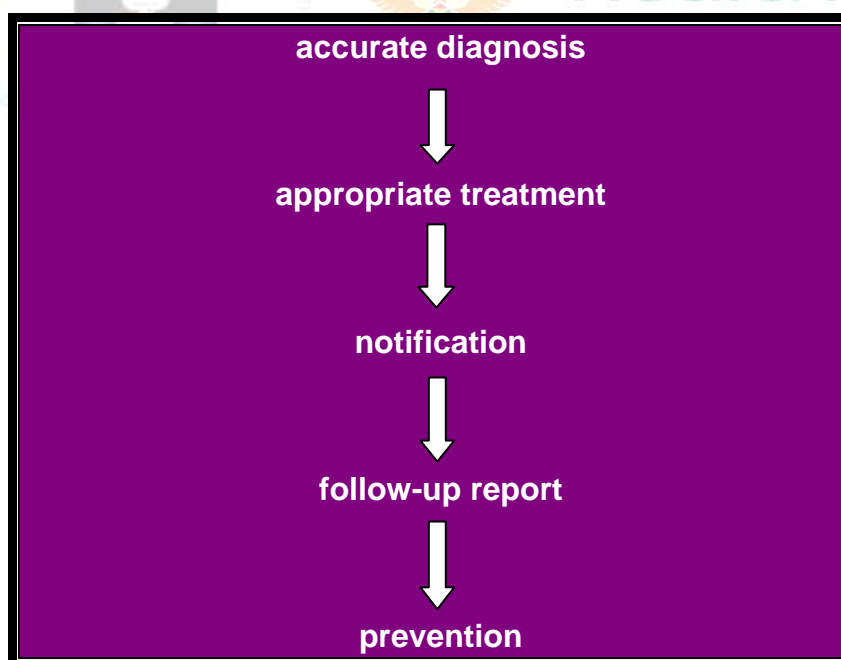


Table 3 provides a list of clinical presentations of health effects by various pesticide groups. This table should be readily available to health professionals presented with potential pesticide poisoning cases.

Table 3: Adverse Health Effects Caused by Selected Classes of Pesticides^a (Thundiyl et al. 2008; <http://www.who.int/bulletin/volumes/86/3/07-041814-table-T1.html>)

Chemical/chemical class	Examples of pesticides	Clinical presentation	Route of exposure ^b
Arsenicals	Arsenic trioxide, CCA, sodium arsenate	Abdominal pain, nausea, vomiting, garlic odour, metallic taste, bloody diarrhoea, headache, dizziness, drowsiness, weakness, lethargy, delirium, shock, kidney insufficiency, neuropathy	O, R, D (rarely)
Borates (insecticide)	Boric acid, borax	Upper airway irritation, abdominal pain, nausea, vomiting, diarrhoea, headache, lethargy, tremor, kidney insufficiency	O, R, D (broken skin)
Carbamates (insecticide)	Carbaryl, thiram, aldicarb, mecarbam	Malaise, weakness, dizziness, sweating, headache, salivation, nausea, vomiting, diarrhoea, abdominal pain, confusion, dyspnea, dermatitis, pulmonary oedema	O, D
Chlorophenoxy compounds (herbicides)	Di/tri- chlorophenoxyacetic acid, MCPP	Upper airway and mucous membrane irritation, abdominal pain vomiting, diarrhoea, tachycardia, weakness, muscle spasm, coma, acidosis, hypotension, ataxia, hypertonia, seizures, dermal irritation, headache, confusion, acidosis, tachycardia	O, D
Calciferol (rodenticide)	Cholecalciferol, ergocalciferol	Fatigue, anorexia, weakness, headache, nausea, polyuria, polydipsia, renal injury, hypercalcaemia	O
Chloralose	Chloralose	Vomiting, vertigo, tremor, myoclonus, fasciculations, confusion, convulsions	O
Copper compounds (fungicide)	Copper acetate, copper oleate	Abdominal pain, vomiting, skin/airway/mucous membrane irritation, renal dysfunction, coma	O, R, D
Coumarins (rodenticide)	Brodifacoum, warfarin, pindone	Echymoses, epistaxis, excessive bleeding, haematuria, prolonged prothrombin time, intracranial bleed, anaemia, fatigue, dyspnea	O, D (possible)
Diethyltoluamide (Insect repellent)	DEET (N,N-diethyl-meta-toluamide)	Dermatitis, ocular irritation, headache, restlessness, ataxia, confusion, seizures, urticaria	O, D
Dipyridil (herbicide)	Paraquat, diquat	Mucous membrane and airway irritation, abdominal pain, diarrhoea, vomiting, gastrointestinal bleeding, pulmonary oedema, dermatitis, renal and hepatic damage, coma, seizures	O, D (via broken skin)
Phosphonates (herbicide)	Roundup, glyphosate	Airway, skin, and mucous membrane irritation, abdominal pain, nausea, vomiting, shock, dyspnea, respiratory failure	O, R
Fluoroacetate (rodenticide)	Sodium fluoroacetate	Vomiting, paresthesias, tremors, seizures, hallucinations, coma, confusion, arrhythmias, hypertension, cardiac failure	O, D (possible)
Mercury, organic (fungicide)	Methyl mercury	Metallic taste, paresthesias, tremor, headache, weakness, delirium, ataxia, visual changes, dermatitis, renal dysfunction	O, R, D
Metal phosphides (rodenticide, fumigant)	Zinc-, aluminium-, magnesium- phosphide	Abdominal pain, diarrhoea, acidosis, shock, jaundice, paresthesias, ataxia, tremors, coma, pulmonary oedema, tetany, dermal irritation	O, R, D
Halocarbons (fumigant)	Cellfume, Methyl bromide	Skin/airway/mucous membrane irritant, cough, renal dysfunction, confusion, seizures, coma, pulmonary oedema	O, R, D
Nitrophenolic and nitroresolic herbicides	Dinitrophenol, dinitroresol, dinoseb, dinosam	Sweating, fever, confusion, malaise, restlessness, tachycardia, yellow skin staining, seizures, coma, renal insufficiency, hepatic damage	O, R, D
Organochlorines (insecticide)	Aldrin, dieldrin HCB, endrin, lindane	Cyanosis, excitability, dizziness, headache, restlessness, tremors, convulsions, coma, paresthesias, nausea, vomiting, confusion, tremor, cardiac arrhythmias, acidosis	O, R, D

Chemical/chemical class	Examples of pesticides	Clinical presentation	Route of exposure ^b
Organophosphates (insecticides)	Malathion, parathion, dichlorvos, chlorpyrifos	Headache, dizziness, bradycardia, weakness, anxiety, excessive sweating, fasciculations, vomiting, diarrhoea, abdominal cramps, dyspnea, miosis, paralysis, salivation, tearing, ataxia, pulmonary oedema, confusion, acetylcholinesterase inhibition	O, D
Organotin (fungicide)	Fentin acetate, fentin chloride	Airway, skin, and mucous membrane irritation, dermatitis, salivation, delirium, headache, vomiting, dizziness	O, R, D
Phenol derivatives (Fungicide, wood preservative)	Pentachlorophenol, dinitrophenol	Skin, airway, and mucous membrane irritation, contact dermatitis, dyspnea, diaphoreses, urticaria, tachycardia, headache, abdominal pain, fever, tremor	O, R, D
Pyrethrins, Pyrethroids	Allethrin, cyfluthrin, permethrin	Allergic reactions, anaphylaxis, dermatitis, paresthesias, wheezing, seizures, coma, pulmonary oedema, diarrhoea, abdominal pain	R, D
Strychnine (rodenticide)	Strychnine	Muscle rigidity, opisthotonus, rhabdomyolysis	O
Thallium (rodenticide)	Thallium sulfate	Abdominal pain, nausea, vomiting, bloody diarrhoea, headache, weakness, liver injury, hair loss, paresthesias, neuropathy, encephalopathy, cardiac failure	O
Triazines (herbicide)	Atrazine, prometryn	Mucous membrane, ocular and dermal irritation	O, R, D

CCA, chromated copper arsenate; HCB, hexachlorobenzene; MCPP, methyl chlorophenoxy propionic acid.

^a This list is an overview and is not meant to be a comprehensive list of all pesticide and pesticide classes. The health worker is encouraged to use other resources and clinical experience in establishing health effect and causality for acute pesticide poisoning. Suggested online references include: http://www.who.int/whopes/recommendations/APCSPesticide_ok.pdf, <http://npic.orst.edu/npicfact.htm>, <http://www.epa.gov/pesticides/safety/healthcare/handbook/handbook.pdf>, <http://www.cdc.gov/niosh/topics/pesticides/pdfs/pest-cd2app2v2.pdf>, <http://hazard.com/msds/>, <http://www.epa.gov/pesticides/reregistration/status.htm>, <http://pesticideinfo.org/>, <http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>, http://www.pesticideinfo.org/Search_Countries.jsp.

^b Route of exposure key: O, oral/ingestion; R, respiratory/inhalation; D, dermal or ocular.



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5. PURPOSE OF AND CURRENT NOTIFICATION PROCESS AND ITS PURPOSE

The Health Act, 1977 (Act 63 of 1977) and regulations stipulate that poisoning from **any** agricultural or stock remedy (Code 989) in terms of the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (36/1947) must be notified to the NDoH (i.e., **all pesticide poisonings must be reported, not just OPs**). This notification process was established to aid the NDoH in observing trends of pesticide poisonings over time. The intention is that through monitoring the occurrence of pesticide poisonings, the NDoH can develop and implement intervention strategies to control and prevent further poisonings in South Africa.

Box 1

In the event that no health care professional has been able to see the poisoned child, then a member of the community is obligated to report the case to the nearest local health authority or district health office for notification and follow-up

The process for notification (Table 4) is such that the first health care professional to come into contact with the patient and who makes a clinical diagnosis of pesticide poisoning (or to whom the case was reported; Box 1) should complete a case-based form (GW 17/5; Annex B). This form, which urgently needs to be up-dated from its current 1977 version, is then sent to the local health authority or district health office. These forms are meant to be filled in

Box 2

If a child dies from a pesticide poisoning the following forms must be completed for the NDoH:

- **GW17/5 (Annex B)**
- **Pesticide Incident Report Form (Annex C)**

as completely as possible to assist Environmental Health Practitioner's (EHPs) with following-up on these cases. If a child dies from a pesticide poisoning, three forms must be completed – two for the poisoning case (i.e., for GW 17/5 and the Pesticide Incident Report Form; Box 2), and another to document the death. This is in order for the NDoH to determine the case/fatality ratio in relation to child pesticide poisonings.

When EHP's follow-up on a notified case they are required to complete the Pesticide Incident Report Form (previously called, Epidemiological Investigation:

Toxicology; Annex C). After completing this form, the EHP or others filling out the form must submit three copies, one to the NDoH, one to the Pesticide Registrar in the Department of Agriculture, Forestry and Fisheries, and one to South Africa's Rotterdam Convention Designated National Authority in the Department of Environment (contact details in Annex C).

Table 4: NDoH Pesticide Poisoning Notification Process Step by Step

Notification Process Steps	Purpose of step
1. Diagnosis of a pesticide poisoning.	All pesticide poisonings that have been clinically diagnosed, reported or caused a death are a medically notifiable disease.
2. The person who diagnoses the poisoning (or to whom the case was reported; Box 1) must notify the local or district health service by filling out a GW 17/5 form (Annex B). This form is also completed if a poisoned child dies.	To inform the health services so that an Environmental Health Practitioner (EHP) can follow-up on the case to prevent further poisoning.
3. The Health Service responds to the reporting by sending out an EHP to investigate the case and complete and pesticide incident report form (Annex C).	For prevention of further poisonings. To comply with the Rotterdam Convention. No notification; No prevention!
4. The local/district health service informs the provincial office of pesticide poisonings on a weekly basis.	This allows the province to conduct poisoning surveillance and to provide support to the health services where needed.
5. Province forwards poisoning data to the National Department of Health. The NDoH: <ul style="list-style-type: none"> • Enters data into national poisoning data base • Sends each Pesticide Incident Report Form (Annex C) to the Department of Environmental Affairs (DEAT) and the Registrar of Pesticides in the 	This is for national disease surveillance (i.e., trends, identifying high risk groups, for international reporting) and to inform pesticide policy. This is for compliance with the Rotterdam Convention for which South Africa is a signatory. DEAT is South Africa's Designated National Authority (DNA) for the Rotterdam Convention.

Source: adapted from <ftp://ftp.hst.org.za/pubs/other/dhis/appb.pdf>

The new Pesticide Incident Report Form in Annex 3 is in order for South Africa to comply with the Rotterdam Convention reporting requirements as South Africa is a signatory. The Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade promotes a shared responsibility between importing and exporting parties in the international trade of certain hazardous chemicals. It gives importing countries the power to decide which chemicals they want to receive and to exclude those they cannot manage safely. That is, the Convention provides a mechanism for countries to decide whether or not they wish to receive future shipments of such pesticide formulations, and for ensuring compliance with these decisions by exporting countries. The Convention includes provisions for developing countries that are experiencing problems with severely hazardous pesticide formulations under conditions of use (e.g., if a particular pesticide is resulting in numerous child poisonings), and to identify the formulations as candidates for inclusion in the Convention. Further information on the operation of the Rotterdam Convention may be found at www.pic.int.

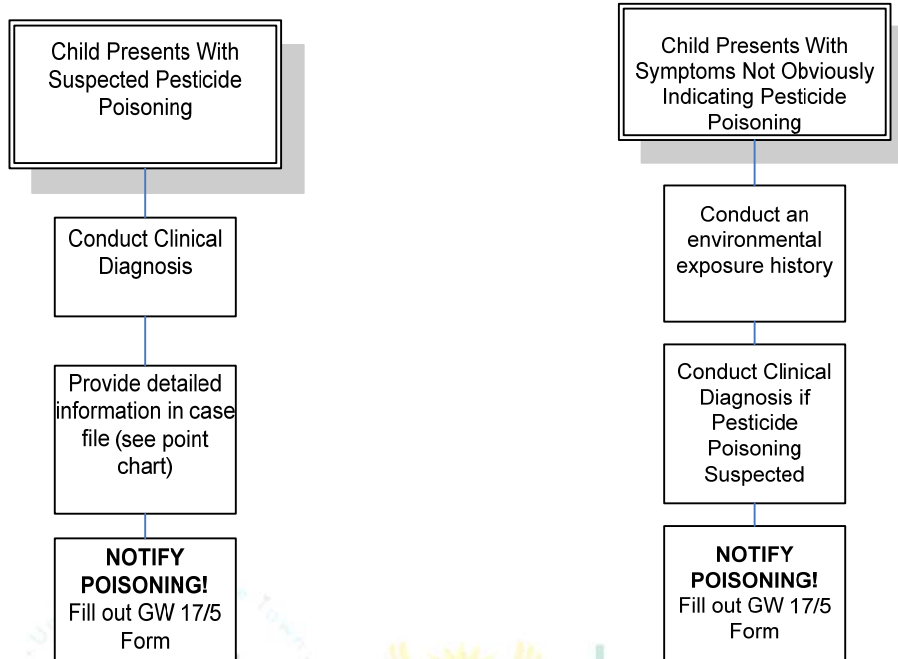
Despite South Africa having in place a monitoring notification process for pesticide poisonings, the current system does not function as intended. Pesticide poisonings are grossly under-reported and policy is not adequately informed by current poisoning statistics (London and Balie 2001). There is a dire need to revitalize this notification process if pesticide poisoning cases are to be reduced. However, revitalizing and up-dating this process needs to be multi-pronged and multi-targeted. One key element is to improve on the diagnosis of pesticide poisoning and to adequately document the poisoning case, and especially to identify the poisoning agent.

Improving on the Current Notification Process

At present there are too many actors along the chain of notification. This results in assumptions that someone else is attending to the matter, especially as health professionals have multiple responsibilities. The NDoH would do well to run a consultative process involving all the various stakeholders on how to improve on the notification system and how to use technology to assist with improving on notification. For example, an SMS could be sent by the diagnosing health professional to a national/central data capturing computer that a child was poisoned by pesticides. This system would then automatically alert the relevant other actors (e.g., EHPs).

6. DIAGNOSIS OF CHILD PESTICIDE POISONING

Process Flow Charts for Evaluating a Sick Child



Health professionals play a vital role in the diagnosis, treatment and prevention of child pesticide poisoning (Holtan 2008). However, it is crucial that health professionals recognize the signs and symptoms of exposure to various pesticides in order to intervene appropriately. Many pesticide poisonings go undetected or are misdiagnosed as symptoms of pesticide poisoning often resemble symptoms associated with common ailments (e.g., flu, fatigue, low energy, rashes, weakness, sleep problems, anxiety, depression; Reigart 1999). Toxicity of pesticides to humans may imitate the modes of toxicity for pests (e.g., rodenticides are anticoagulants, OPs and carbamates are neurotoxic). Health care professionals should be well versed in the symptoms of pesticides commonly used in their communities (Useful Websites in Annex A). The pesticide label and relevant Safety Data Sheets also provide active/inert ingredients and treatment information (Useful Websites Annex A).

In order not to miss or overlook a child presenting with a pesticide poisoning, a careful exposure history needs to be taken (Reigart 1999). As children are highly exposed to pesticides, ruling out pesticide exposure as the source of symptoms should become common practice by all health professionals in urban and rural areas of South Africa. In order to properly diagnose pesticide poisonings, health professionals need to conduct a detailed environmental history (to learn how to take a paediatric environmental history go to: <http://www.neefusa.org/pdf/EnvhistoryNEETF.pdf>). Also see Annex E on guide on how to conduct an environmental exposure history for children who have had possible exposures to pesticides.

7. ROLE OF THE HEALTH PROFESSIONAL IN POISON PREVENTION

Health professionals play a unique role in pesticide poisoning prevention because of their regular contact with patients, care givers and the general public. However, the expectation is not that all health professionals will attempt to prevent every future pesticide poisoning case, but more that there is an awareness among health professionals, that health professionals have access to prevention information and that opportunities to intervene are then taken.

The key to prevention is:

1. For health professionals to keep abreast of the latest research on pesticides, especially in relation to the health effects on children;
2. For health professionals to know alternatives to pesticides used in public health (i.e., lice, scabies, mosquito repelling); and
3. For health professionals to be instrumental in risk awareness, and communicating pesticide risks and prevention measures.

Prevention

As pesticide poisoning can cause long term detrimental health effects to children, it is vital to prevent exposures. Health professionals have several tools for pesticide poisoning prevention:

- Inform caregivers (Annex A for information and prevention resources);
- Know the contact details of persons and organizations that the caregiver can contact; and
- Have materials available for caregivers to read and take with them – have these translated into the relevant languages.

Awareness Raising and Risk Communication

Health professionals can stay abreast of the current literature of pesticide-related health effects through joining internet sites and reading current research (Annex A). This information should then be shared through discussions with caregivers or through providing handouts. Health professionals also have a role to play in pesticide risk communication. See Annex D for a sample risk communication tool. This provides an example of the type of risk communication mechanisms that health professionals can distribute and that can be made available from physicians offices, clinics, hospitals, etc. The poster in Annex G should be hung up in relevant places to promote awareness and to assist with accurate diagnosis. It is important to make sure that care givers and patients understand the information being communicated to them by presenting information either orally in an appropriate language, or written in several appropriate languages, using non-technical jargon and ensuring no words used have ambiguous interpretations.



***Children have a right to a safe and healthy environment –
prevent pesticide poisoning!***

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Thundiyil, J.G., Stober, J., Besbelli, N., and Pronczuk J. (2008) Acute Pesticide Poisoning: A Proposed Classification Tool. *Bulletin of the World Health Organization* 86: 205-209.

Weiss, B., Amler, S., Amler, R., 2004. Pesticides. *Pediatrics*. 113(4): 1030-1036.

Zahm SH., Ward, MH., 1988. Pesticides and childhood cancer. *Environmental Health Perspectives*, 106, Supplement 3:893-908.



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Annex A: Resources

Useful Websites:

Recognizing Signs and Symptoms of Pesticide Poisonings:

- Recognition and Management of Pesticide Poisonings. Fifth Edition. 1999. Full text available at: <http://www.epa.gov/oppfead1/safety/healthcare/handbook/handbook.htm>
- Physician's Guide to Pesticide Poisoning (includes pesticide label): http://www.getipm.com/thebestcontrol/physicians_guide/howto.htm
- Managing Pesticide Poisoning Risk and Understanding the Signs and Symptoms: <http://www.ianrpubs.unl.edu/eublic/live/ec2505/build/ec2505.pdf>
- Pesticide Poisoning Symptoms and First Aid: <http://extension.missouri.edu/xplor/agguides/agengin/g01915.htm>
- General pesticide info and symptom indicators - <http://www.epa.gov/opp00001/about/types.htm>

Current Pesticide Information on the Internet:

- On-line Free CME course – Physician Interaction with Patients and Families about Pesticide Exposures (available through 30 June, 2011) - <http://www.pesticideeducation.com/course>
- Southern African Pesticide List Server - <https://lists.uct.ac.za/mailman/listinfo/pesticides-1>
- Facts sheets on inert and active ingredients found in pesticides - <http://www.npic.orst.edu/npicfact.htm>
- Searchable data base of nearly 3,000 acute cases of pesticide exposures - <http://www2.cdc.gov/niosh-sensor-pesticides/search.asp>
- Pesticides Chapter in A Community Guide to Environmental Health - http://www.hesperian.info/assets/EHB/14_Chapter14.pdf
- 2009 UK Pesticide Action Network's List of List of Pesticides – A catalogue of lists of pesticides identifying those associated with particularly harmful health or environmental impacts – <http://www.pan-uk.org/List%20of%20Lists.html>

Notification of Pesticide Poisoning:

- South Africa National Department of Health- http://www.doh.gov.za/docs/misc/epi_comment/notify.html

Poison Prevention Resources:

- Prevent Poisonings in Your Home <http://www.epa.gov/opp00001/health/poisonprevention.htm>
- What you need to know about pesticide poisoning <http://www.ecosmart.com/discover/learn-more>

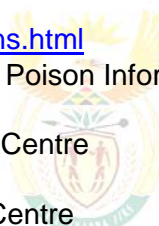
- Lice control alternatives
<http://www.beyondpesticides.org/alternatives/factsheets/Head%20Lice%20Control.pdf>
- Pesticides are Poison (Chapter in A Community Guide to Environmental Health)
http://www.hesperian.org/action_topics_environmentalHealth.php

Risk Communication and Health Literacy

- Risk Communication
<http://www.btny.purdue.edu/Pubs/PPP/PPP-52.pdf>
<http://www.who.int/foodsafety/micro/riskcommunication/en/>
<http://www.atsdr.cdc.gov/risk/riskprimer/index.html>
- Health Literacy
<http://nnlm.gov/outreach/consumer/hlthlit.html>
<http://www.hrsa.gov/healthliteracy/>
<http://www.healthliteracy.com/>

Other:

- South Africa National Department of Health:
Tel: 012-312-0992 / 0767
Fax: 012-312-0815
<http://www.doh.gov.za/docs.dns.html>
- Red Cross Children's Hospital Poison Information Centre
Tel: 021-689-5227/5378/5075
- Tygerberg Poison Information Centre
Tel: 021-931-6129
- Bloemfontein Poison Control Centre
Tel: 082 491 0160
- Child Safe- Child Accident Prevention Foundation of Southern Africa
Tel: 021-685-5208
<http://www.childsafe.org.za/>



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Annex B: GW 17/5 Form

Notification of medical condition
(Sections 32, 47(i)(a) and 47(i)(b) of Act 63 1977)
Department of National Health and Population Development



Aanmelding van mediese toestand
(Artikels 32, 47(i)(a) en 47(i)(b) van Wet 63 van 1977)
Departement van Nasionale Gesondheid en Bevolkingsontwikkeling

Please print ● Where appropriate, mark the correct box with a tick (✓) ● Complete in duplicate. Original to be sent to local authority where patient was diagnosed; copy to remain in book.

Gebruik asseblief drukskrif ● Waar toepaslik, merk die korrekte blok (✓) ● Voltooi in duplikaat. Die oorspronklike word gestuur aan die plaaslike owerheid waar die pasiënt gediagnoseer is; die afskrif bly in die boek.

DETAILS OF PATIENT				BESONDERHEDE VAN PASIËNT			
Surname		Van		First names		Voornaam	
Age	Ouderdom	Sex	Male <input type="checkbox"/> <i>Manlik</i> Female <input type="checkbox"/> <i>Vroulik</i>	Gestag	Ethnic group	Asian <input type="checkbox"/> <i>Asiër</i> Coloured <input type="checkbox"/> <i>Kleurling</i>	Black <input type="checkbox"/> <i>Swart</i> White <input type="checkbox"/> <i>Blank</i>
Residential address If resident on a farm, state farmer's name as well as name and number of farm. In other rural areas, give name of chief, induna, village, nearest hill or river, nearest school or clinic				Woonadres Indien woonagtig op 'n plaas, noem die boer se naam sowel as die naam en nommer van die plaas. In ander landelike gebiede, gee die naam van die stamkaptein, induna, dorp, naaste hewul of rivier, naaste skool of kliniek			
District				Distrik			
Tel. no.				Tel. nr.			
Name and address of employer, school, creche or other institution where patient spends much of the day				Naam en adres van werkgewer, skool, creche of ander instelling waar die pasiënt 'n groot gedeelte van die dag is			
Tel. no.				Tel. nr.			
DETAILS OF MEDICAL CONDITION				BESONDERHEDE VAN MEDIESE TOESTAND			
Medical condition				Mediese toestand			
Date of onset		Aanvangsdatum		Date of death (if applicable)		Sterftedatum (indien van toepassing)	
Possible place of infection				Moontlike plek van infeksie			
Diagnosis was based on				Diagnose is gebaseer op			
Clinical history and examination only <input type="checkbox"/> <i>Niet kliniese geskiedenis en ondersoek</i>				Clinical and other investigations <input type="checkbox"/> <i>Kliniese en ander ondersoeke</i>			
RESULTS OF INVESTIGATIONS				ONDERSOEKRESULTATE			
Investigation (excluding TB sputum)		Ondersoek (TB sputum uitgesluit)		Results		Resultate	
						Awaiting result <input type="checkbox"/> <i>Wag vir resultaat</i>	
						Awaiting result <input type="checkbox"/> <i>Wag vir resultaat</i>	
						Awaiting result <input type="checkbox"/> <i>Wag vir resultaat</i>	
If TB, give sputum result →		Microscopy		Mikroskopiese		Culture	
		Positive <input type="checkbox"/> <i>Positief</i> Negative <input type="checkbox"/> <i>Negatief</i> Awaiting results <input type="checkbox"/> <i>Wag vir resultaat</i>				Positive <input type="checkbox"/> <i>Positief</i> Negative <input type="checkbox"/> <i>Negatief</i> Awaiting results <input type="checkbox"/> <i>Wag vir resultaat</i>	
						← Indien TB, gee sputum resultaat	
REFERRED TO				VERWYS NA			
Name of hospital or clinic				Naam van hospitaal of kliniek			
Patient Registration No.		Pasiënt registrasie nr.		Date of admission		Datum van opname	
NOTIFIED BY				AANGEMELD DEUR			
Name				Adres			
Address				Profession			
				Medical practitioner <input type="checkbox"/> <i>Geneesheer</i> Nurse <input type="checkbox"/> <i>Verpleegster</i> Other <input type="checkbox"/> <i>Ander</i>			
				Signature			
				Handtekening			
Tel. no.				Tel. nr.			
				Date			
				Datum			
Local authority: If a copy of this notification is to be sent to another local authority, please confirm whether you will include this notification in your weekly summaries (GW 17/3 or 17/4)				Yes <input type="checkbox"/> <i>Ja</i> No <input type="checkbox"/> <i>Nee</i>			
Reply by LOCAL AUTHORITY				ANTWOORD DEUR PLAASLIKE OWERHEID			
Reply to referring doctor/nurse with brief report of further findings and management				Antwoord aan verwysende dokter/verpleegster oor verdere bevindinge en hantering			
Signature		Handtekening		Date		Datum	
Tel. no.		Tel. nr.		Tel. no.		Tel. Nr.	

GW 17/5

Annex C: Pesticide Incident Report Form: *EHP follow-up on poisoning cases*

EHP's are required to complete this form immediately after receiving notification of a poisoning. Fill in the information as completely as possible and in as much detail as is available as this will assist in poison prevention and. These forms must be submitted to three government departments (details at the end of the form).



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PESTICIDE INCIDENT REPORT FORM



This form must be completed for each individual exposed in a given incident - Where an incident involves more than one pesticide formulation please complete Section II for each pesticide.

I. Patient Information - Demographics

1. Date of poisoning: (DD/MM/Year).....
2. Location of poisoning: farm/village/city/factory/company:
address:.....
province:.....
3. Questionnaire information provided by: patient mother farmer/manager other
4. Name of Patient:
5. Cell number of patient/care giver:
6. Address where poisoning occurred:
7. Sex: male female
8. Date of Birth (DD/MM/Year)..... or age:
- If age unknown: child (0-5yrs) child (5-12yrs) adolescent (13-17 yrs) adult (18yrs and up)
9. Race: African Coloured White Asian/Indian
10. Occupation
11. Grade/Standard passed (indicated which):
12. Main activity of patient at time of exposure (*check one or more of the following*):

<p>HOME:</p> <input type="checkbox"/> <i>home garden application</i> <input type="checkbox"/> <i>veterinary/pet application</i> <input type="checkbox"/> <i>household application</i> <input type="checkbox"/> <i>applying onto human</i> <input type="checkbox"/> <i>playing away from home</i>	<p>WORK:</p> <input type="checkbox"/> <i>re-entry to treated field</i> <input type="checkbox"/> <i>selling pesticides</i> <input type="checkbox"/> <i>vector control application</i> <input type="checkbox"/> <i>application in field</i> <input type="checkbox"/> <i>mixing/loading.....</i>	<p>OTHER:</p> <input type="checkbox"/> <i>school/crèche</i> <input type="checkbox"/> <i>applied on patient for health</i> <input type="checkbox"/> <i>other, please specify:</i>
---	--	--
13. Were there other individuals poisoned in the same incident? no yes

Form Date: September 2009

II. Pesticide Involved

14. Name of the active ingredient(s) in the formulation:
15. Trade name and name of manufacturer:.....
16. Type of formulation (check one of the following):
- | | | |
|---|--|--|
| <input type="checkbox"/> liquid/ <i>Emulsifiable Conc. (EC)</i> | <input type="checkbox"/> <i>Wettable Powder (WP)</i> | <input type="checkbox"/> <i>Dustable powder (DP)</i> |
| <input type="checkbox"/> <i>Water Soluble Powder (SP)</i> | <input type="checkbox"/> <i>Vapour</i> | <input type="checkbox"/> <i>Tablet (TB)/ balls</i> |
| <input type="checkbox"/> <i>Granular (GR)</i> | <input type="checkbox"/> <i>Coil/pads</i> | <input type="checkbox"/> <i>Pellets/bait</i> |
| <input type="checkbox"/> <i>Shampoo</i> | <input type="checkbox"/> <i>Lotion/roll-on</i> | |
| <input type="checkbox"/> <i>other, please specify:.....</i> | | |
- If not known, describe pesticide as best as possible (provided colour and if liquid, granules , etc.):*
-
-
17. If exposed to more than one pesticide formulation at the same time, respond to all points below for each formulation (use additional pages if necessary):
- i) Was the pesticide in its original container? no yes
- ii) Was the label available? no yes
- If yes, was patient able to read and understand health and safety information on label? no yes
- If no, why not: *low literacy level* *cannot read label language* *was not aware of health & safety information on label*
- Attach copy of the label(s), if available.* *label(s) attached*
18. Application method: (*How product was used e.g. hand, bucket & brush, soil injection, spray (backpack, tractor mounted, etc), drip irrigation, aerial (helicopter, plane etc.)*):
-
19. Describe why the pesticide was being used:
-
20. Where was the pesticide sourced from:
- | | | |
|--|--|---|
| <input type="checkbox"/> <i>local store/supermarket</i> | <input type="checkbox"/> <i>farmer's cooperative</i> | <input type="checkbox"/> <i>street vendor/informal market</i> |
| <input type="checkbox"/> <i>from pesticide store on farm</i> | <input type="checkbox"/> <i>provided by farmer/manager</i> | <input type="checkbox"/> <i>pesticide/agrochemical dealer</i> |
| <input type="checkbox"/> <i>other:</i> | | |
21. Name of supplier of pesticide

III. Poisoning Event:

22. Time of poisoning: morning midday afternoon dusk (just before dark)
23. Circumstances of poisoning: accidental occupational (during work) homicide
 self-harm home use other.....
24. Describe in detail how the incident occurred:
25. Patient's reaction to pesticide exposure (tick one or more of the following):
- dizziness headache blurred vision excessive sweating
 hand tremor convulsion staggering narrow pupils/miosis
 excessive salivation nausea/vomiting other symptoms, please specify:
26. Outcome: survived died
27. Route of exposure (check main route or more than one if applicable)
- mouth skin eyes inhalation
 other, please specify:.....
28. Interventions (can tick more than one): saw traditional healer saw minister of a religion
 went to public clinic went to hospital went to private doctor or private hospital
 other.....
- Provide details (name, place name, address, date of visit).....
29. Hospitalization: No Yes, but not ICU Yes, in ICU Unknown
30. Treatment given: No Yes Unknown
31. On what basis was treatment initiated:
- History of exposure/poisoning from patient/carer
 Label or container brought in by patient/carer
 Narrative of clinical symptoms compatible with poisoning
 Clinical signs
 Lab tests (biochemical testing)
 Post mortem
 Patient smelled of pesticides
 Other,
32. Was this person previously poisoned in the last year by pesticides? No Yes
- If yes, when..... what active ingredient.....
33. Has the site where the poisoning occurred (farm, home, workplace, etc) reported in the last year any other pesticide poisoning?:
- No
 Yes, when.....

Fax, e-mail or post the completed *Pesticide Incident Report Form* to **all** three of the following departments:

1) National Department of Health

Mr. Ramsook Loykisoona
Deputy Director: Environmental Health
Directorate: Environmental Health
National Department of Health
Private Bag X828
Pretoria, 0001
Tel: 012 - 312 3256
Fax: 012 - 312 3181
LoykiR@health.gov.za

2) Department of Environment

Ms Nolwazi Cobbinah
Chief Director: Pollution and Waste Management
Rotterdam Convention Designated National Authority
Department of Environment
Private Bag X447
Pretoria, 0001
Phone: +27 12 310 3356
Fax: +27 12320 0024
NCobbinah@deat.gov.za or ngwayi@deat.org.za

3) Department of Agriculture, Forestry and Fisheries

Mr. Jonathan Mudzunga
Registrar: Act No. 36 of 1947
Department of Agriculture, Forestry and Fisheries
Private Bag X343
Pretoria, 0001
Tel.: 012 319 7303
Fax: 012 319 6764
MalutaM@daff.gov.za

Annex D: Sample Risk Communication Tool

This pamphlet can be downloaded in English, Afrikaans and Xhosa at:

www.coehr.uct.ac.za

What can I do as a parent???

- Keep pesticides locked away & out of reach of children
- Keep pesticides in their original labeled container
- Keep children out of the house during spraying and air out before entering
- Know the signs and symptoms
- If your child has pesticide poisoning:
 1. Go to a doctor/clinic immediately!
 2. Take the label or pesticide with you!!!
 3. Prevent it from happening again!!!

POISON INFORMATION (24hrs)
 Red Cross Children's Hospital Poison Info Centre (021) 689 5227
 Tygerberg Poison Info Centre (021) 931 6129
 Netcare Poison Centre 0800 333 444 (toll free)



CHILD ACCIDENT PREVENTION FOUNDATION OF SOUTHERN AFRICA **Safe Kids**

Did you know???

- Pesticide labels tell you how dangerous they are. Look for the colour code on the front of this pamphlet & match it with the colour strip on the pesticide container.
- Pesticides can cause cancer, behavioural problems, allergies & asthma.
- Pesticides stay in the environment for many years.
- Pregnant women should avoid use of or exposure to all pesticides.
- Unlabelled pesticides are very dangerous.
- Pesticides sold by street vendors can be illegal & very toxic.

NO Don't Use These!

NO VERY DANGEROUS!!!

WHAT IS DAMAGING YOUR CHILD?

Pesticides???

Pesticide Label Color Codes

- **Very Toxic**
- **Harmful**
- **Caution**
- **Keep locked away**

Found on pesticides bought in shops.



OCCUPATIONAL & ENVIRONMENTAL HEALTH RESEARCH UNIT—University of Cape Town
ohm@oehr.uct.ac.za T: (021) 406 6300
 F: (021) 406 8183
 Funding from Medical Research Council grant

Annex E: Conducting an Environmental History

A critical tool for diagnosing disease properly is conducting a good environmental history, especially when symptoms are difficult to link to cause. Health professionals should routinely ask questions of their patients or patient's caregivers to assess what exposures to pesticides they may have had, particularly as many pesticide poisoning symptoms mimic other causes (e.g., OP pesticides can cause flu like symptoms). Thus the questions provided here are a guideline for taking an environmental history and should be adapted to the particular context where the health professional is working. Ideally a questionnaire, with tick responses for most questions, should be developed and copies easily accessible. Furthermore, environmental histories are useful tool for assessing various hazardous environmental exposures. Resources are provided in Annex A on conducting general environmental histories. However, this guide focuses specifically on pesticide exposures for children only.

Environmental History Exposure – Pesticides

Do you have a problem with pests in your home?

What pest problems do you have?

What do you do to control these pests?

If uses pesticides, ask the following questions:

NB: Whenever a response is given that a pesticide was used, ask what the product was, was there a label and/or describe the product by using the Point Chart in Annex F.

Are pesticides used to control for rats/mice? If yes, are these pesticides bought in the shop, distributed by the municipality/health department or bought on the street (i.e., taxi ranks, street markets, train vendors, etc)? Use point chart in Annex F. When last was this product used? How and where was this product placed for the rats/mice to have access to it?

What pesticides are used in the child's home to control for other pests (e.g., cockroaches, flies, ants, termites, bed bugs, fleas)? When last was each product used?

Does the child sleep on a bed that has been sprayed/treated with pesticides to control for bed bugs? If yes, when was the last time the bed was sprayed/treated?

Does the child live in a house in a malaria area or visit a house in a malaria area?

Is this house sprayed on the inside to control mosquitoes?

When last did the school/crèche the child attends spray pesticides in the buildings and outside property?

Did the child recently fly in a plane that was sprayed with pesticides for malaria control?

Has the child recently had lice or scabies?

If yes, what was used to control the lice or scabies?

Does the child live in a home with pets/animals?

If yes, when last were these pets/animals treated with chemicals/pesticides for fleas, ticks, etc.?

Are mosquitoes a problem where the child lives?

If yes:

- When last was the child in a room where a mosquito coil was burnt?
- When last was the child in a room or slept in a room where a pesticide vapour/pad was plugged into an electrical plug?
- When last was a spray or stick (e.g., Tabard) used on the child's skin?

Has the child come into contact with wood that has been treated with a pesticide?

Are pesticides used on the outside property/garden where the child plays or has access to? When were pesticides last sprayed/applied in this area?

Where are pesticides stored that are used in the home/garden or on the property?

Where are left over pesticides and empty containers disposed of?

Are pesticides containers re-used? For what?

For children living in an agricultural area:

What type of work does the parents/care giver do?

If the parent/care giver sprays/mixes/applies pesticides or works in fields sprayed with pesticides:

- Do they shower/wash before coming to the place where the child lives?
- Do they change their shoes after work?
- Do they wash pesticide contaminated clothing or the child's clothes at work?
- Do they bring pesticides from the farm to use at home?

How close is the property the child stays in to a field sprayed with pesticides?

Where is the school or crèche located in relation to fields that are sprayed?

Is aerial pesticide spraying done near where this child lives, plays and goes to school?

Does the child play in or near the fields that are sprayed?

Does the child help work in the fields? When last was the child in the field? When last was the field sprayed?

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Health Related Questions Particularly for Non-Clinically Diagnosed Pesticide Poisoning

Do these symptoms the child has seem to occur at the same time of the day?

Do symptoms seem to occur after being at the same place every day?

Do symptoms seem to occur during a certain season?

Are other family members experiencing similar symptoms?

Does your child suffer from any of the following recurrent symptoms?

Cough Headaches Fatigue Unexplained pain _____



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Annex F: Point Chart

This document, developed by the COEHR, is intended to be printed back to back as a laminated A5 chart for health professionals to carry with them or to have easy access to. This could also be made into a laminated poster to be hung in various health facilities treating children.



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Common Pesticide Active Ingredients Responsible for Poisonings

In order to provide the best possible treatment for victims of pesticide poisonings it is important to try find out the active ingredient on the label. If there is no label, refer to

Common Organophosphates:

- Methyl Parathion
- Ethyl Parathion
- Malathion
- Diazinon
- Fenthion
- Dichlorvos
- Chlorpyrifos
- Trichlorfon

Common Anticoagulants:

- Brodifacoum
- Difethialone
- Difethcalone
- Chlorofacimone
- Coumachlor
- Difenacoum
- Diphacinone
- Warfarin

Common Pyrethroids:

- Allethrin
- Bifenthrin
- Cypermethrin
- Permethrin
- Deltamethrin

Common Carbamates:

- Aldicarb
- Carbofuran
- Oxamyl
- Methomyl
- Formetanate
- Methiocarb
- Aminocarb
- Mecarban
- Bendiocarb
- Dimetilan
- Propoxur

Common Herbicides:

- Glyphosate
- Atrazine
- Nicosulfuran
- Fenoxaprop
- Sulfometuron
- Alachlor
- Pendamethalin
- Halosulfuran



Produced by:
The Centre for Occupational & Environmental Health Research (COEHR)
School of Public Health & Family Medicine,
University of Cape Town, South Africa.
<http://www.coehr.uct.ac.za>
E-mail: oah-pesticides@uct.ac.za

Suspected Pesticide Poisonings

PURPOSE: This document is intended to assist Environmental Health Practitioners, health care professionals, and Poison Information Centres in identifying the pesticide involved in suspected pesticide poisoning cases.

DIRECTIONS FOR IDENTIFYING TYPE OF PESTICIDE(S) INVOLVED IN POISONING CASE

When health professionals diagnose an individual with pesticide poisoning they must:

1. **Notify ALL pesticide poisonings to the Department of Health regardless of the active ingredient it contains.** Do not report ONLY organophosphate poisonings.
 - A case-based form (GW 17/5) must be filled out and sent to the local or district health authority.
2. Try to identify what type of pesticide caused the poisoning and provide as much detailed information in the individual's case file. To do this, use the following questions as a guide:
 - a. Did the pesticide have a label? If so, then record the name of the product and its active ingredient. If not, then ask the care giver if they know the name of the product.
 - b. What form did the pesticide take? (E.g. granules, pellets, powder, liquid)? Ask the care giver to describe what it looked like (Color, container, etc.). Use the **Point Chart on the following pages**, to have the poisoned individual or caregiver point to the product they used/were exposed to. If they can point to an image, be sure to note the active ingredient in the case report.
 - c. Where was the pesticide purchased? Store? Spaza shop? Street seller (e.g. taxi rank, market)? Chinese shop?
 - d. What was the pesticide used for?

It is important to record all this information in as much detail as possible so that the National Department of Health (NDOH) can monitor the occurrence of pesticide poisoning, develop and implement intervention strategies, while at the same time scrutinize the strategies' effectiveness.

Without good information, and reporting, pesticide poisonings can not be prevented.

POISON INFORMATION CENTRES :

Rad Cross Children's Hospital Poison Info Centre: (021) 659 5227

Tygerberg Poison Info Centre: (021) 931 6129

Bloemfontein Poison Control Centre: 082 491 0160



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WHAT DID THE PESTICIDE LOOK LIKE? Please point

PYRETHROIDS



ANTICOAGULANT: Difethcalone



ANTICOAGULANT: Difethialone



ANTICOAGULANT: Brodifacoum



POSSIBLE ORGANOPHOSPHATES:

Clear/Yellow=potentially methamidophos
White=potentially chlorpyrifos



CARBAMATE: Aldicarb



NAPHTHALENE



ORGANOPHOSPHATE:

Acephate



Annex G: Example poster

This poster can be hung in various health facilities for awareness raising and improving on poisoning diagnosis.



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WHICH OF THESE WAS YOUR CHILD EXPOSED TO?

ORGANOPHOSPHATES

Clear/Yellow= potentially methamidophos;
White = potentially chlorpyrifos

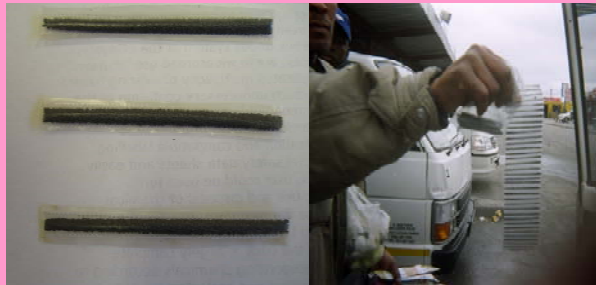


PYRETHROIDS



CARBAMATES

Aldicarb



ANTICOAGULANTS

Difethialone



Difethialone

Brodifacoum
























NAPHTHALENE



Annex H: Pesticide Label Card

The Pesticide Label Card was developed by the COEHR as a quick reference to what the pictograms and toxicity colour codes on pesticide labels mean.

Pesticide Label Pictograms and Colour Codes	
Meanings of Advice & Warning Pictograms	
	Wear Gloves
	Keep locked away and out of reach of children
	Wash after use
	Wear protection over nose and mouth
	Wear boots
	Dangerous/harmful to wildlife and birds
	Not for aerial application
	Wear respirator
	Dangerous/harmful to fish - do not contaminate lakes, rivers, ponds or streams
	Dangerous/harmful to livestock and poultry
 <p>Centre for Occupational and Environmental Health Research (COEHR) University of Cape Town, South Africa Tel : (021) 4066300</p>	
	
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	Wear eye protection
30/12/2005	Expiry date
	
Meanings of Activity Pictograms:	
	Handling liquid concentrate
	Handling dry concentrate
	Application
Meanings of Colour Codes: listed from the most (1) to the least (4) dangerous.	
1 	Very Toxic: Most toxic pesticide group sold in SA. Protective equipment and clothing MUST be used.
2 	Harmful: 2nd most toxic pesticide group sold in SA. Use all precautions stated on label.
3 	Caution: Use carefully and use protection
4 	Keep Locked Away: All pesticides are poisonous. Store away from children, food & animals
<p>Contact: oeh-pesticides@uct.ac.za</p>	