

# Public Health Practice

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Roy Goulding

## Accidental pesticide poisoning: the toll is high

Accidental poisoning with pesticides causes much illness and loss of life every year. Residues of toxic chemicals are responsible for some of the damage, but more significant is the exposure of workers handling the products. Every country should have enforceable regulations on the marketing and use of pesticides, and primary health care personnel should be able to respond effectively to cases of poisoning wherever they occur.

Pesticides are vitally important in the protection of crops and livestock and in the control of vectors of human diseases, yet, in many countries, they constitute a danger to people. This arises not so much from residues in food crops and stock as from the handling of the products by farm workers and others.

In each country there should be a centre for assembling and investigating reports of pesticide poisoning. If the primary data are unreliable, deductions drawn from them are unlikely to be sound.

The number of deaths globally from pesticide poisoning has been estimated at about 80 000 per annum, using a case fatality rate of 0.5% for the developing

countries and one of 0.25% for the developed countries (1). Although these values are based on incomplete information, there can be no doubt that pesticide poisoning is a major worldwide problem.

### Safeguards

For too long, experts have been making recommendations on this subject to virtually no avail. To be effective, action should be launched at the village and field level.

It has to be recognized by all concerned that pesticides have the potential to harm humans. However, there is no uniformity of toxicity among the different pesticide chemicals. Biochemically they do not all act in the same way. Thus rodenticides are likely to be more hazardous to man than, say, many of the herbicides. So it is possible to distinguish between dangerous pesticides and relatively innocuous ones.

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The physical form of a pesticide has an influence on the risks associated with it. Fumigant gases may prove lethal if inhaled, whereas granules are usually much less hazardous, even in contact with the skin. Some agents pass through the skin readily and thus bring about systemic poisoning. Much may depend on the concentration of an active ingredient. It is also advisable to consider the methods of application of pesticides. The hazards arising from aerial spraying, for instance, are distinct from those associated with the use of knapsack sprayers. There is no single set of rules for the safe use of pesticides which caters for every eventuality. Instructions and restrictions are accordingly framed with regard to specific pesticides, formulations, application methods, crops, and so on, although certain general principles hold in all circumstances. The World Health Organization has recommended that governments, industry and others should follow the Food and Agriculture Organization's International Code of Conduct on the Distribution and Use of Pesticides (see box overleaf). Only by assiduous adherence to it will accidental pesticide poisoning be reduced to negligible proportions.

Naturally, there is no point in demanding good conduct on the part of industry, exchanging toxicological information between states, and having rules on trading, labelling, packaging, storage and disposal unless powers of enforcement exist. In fact there is little prospect of globally applicable rules devised by international bodies and adjudicated on by international courts. Each government should therefore set up an effective regulatory scheme.

No pesticide formulation should be allowed on the market without official registration. The granting of approvals should be entrusted to an expert body with an

interdisciplinary and interministerial constitution, and its members should be fully acquainted with local circumstances and practical requirements. Each authorization of a product should be accompanied by directions regarding:

- the precise use for which it is intended;
- the rates of application;
- the mode of application.

Preference should be shown for the safest chemicals and formulations, possibly by means of a pricing structure that makes them relatively attractive to potential users. Such products can go on general sale. Somewhat more hazardous products should be available only to purchasers regarded as competent to handle them responsibly. Finally, there are the highly dangerous substances needed to control some important pests; these products should be available only to officially recognized operators who are well informed and equipped with all necessary protection. Any products found on the market without the official cachet should

**No pesticide should be allowed on the market without official registration.**

be confiscated. Penalties may have to be imposed, although it is usually preferable to take only corrective action.

### Front-line defences

In order to avoid the development of a costly bureaucracy, emphasis should be placed on the maintenance of a dependable, well-informed and coordinated field force in

## **Extracts from the International Code of Conduct on the Distribution and Use of Pesticides**

This Code, developed by the Food and Agriculture Organization in consultation with other United Nations bodies, is published in Arabic, English, French and Spanish. The full text may be obtained from: FAO, Via delle Terme di Caracalla, 00100 Rome, Italy. Extracts are given below.

### **Pesticide management**

Governments... should take specific powers to regulate the distribution and use of pesticides in their countries.

Pesticides whose handling and application require the use of uncomfortable and expensive protective clothing and equipment should be avoided, especially in the case of small-scale users in tropical climates.

### **Reducing health hazards**

Governments... should provide guidance and instructions for the treatment of suspected poisoning by pesticides for their basic health workers, physicians and hospital staff.

Industry should make every reasonable effort to reduce hazard by... introducing products in ready-to-use packages and otherwise developing safer and more efficient methods of application.

### **Availability and use**

Governments should take note of and, where appropriate, follow the WHO-recommended classification of pesticides by hazard<sup>a</sup> and associate the hazard class with well-recognized hazard symbols as the basis for their own regulatory measures.

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<sup>a</sup> WHO recommended classification of pesticides by hazard and guidelines to classification (unpublished document VBC/88.953, obtainable from Division of Vector Biology and Control, World Health Organization, 1211 Geneva 27, Switzerland).

### **Distribution and trade**

Industry should test all pesticide products to evaluate safety to human health and the environment prior to marketing... [and] see that persons involved in the sale of any pesticide are trained adequately to ensure that they are capable of providing the buyer with advice on safe and efficient use.

Governments and responsible authorities should take the necessary regulatory measures to prohibit the repackaging, decanting or dispensing of any pesticide in food or beverage containers and should rigidly enforce punitive measures that effectively deter such practices.

### **Information exchange**

The government of a pesticide-exporting country which takes action to ban or severely restrict the use or handling of a pesticide in order to protect health or the environment domestically should notify, directly or indirectly, the designated national authorities in other countries of the action it has taken.

### **Labelling, packaging, storage and disposal**

All pesticide containers should be clearly labelled in accordance with applicable international guidelines, such as the FAO Guidelines on Good Labelling Practice.

### **Advertising**

Industry should ensure that advertisements do not contain any statement or visual presentation which... is likely to mislead the buyer, in particular with regard to safety.

Governments are encouraged to work with manufacturers to take advantage of their marketing skills and infrastructure, in order to provide public-service advertising regarding the safe and effective use of pesticides.

### **Monitoring observance of the Code**

The Code should be brought to the attention of all concerned in the manufacture, marketing and use of pesticides and in the control of such activities, so that governments,... industry and international institutions understand their shared responsibilities in working together to ensure that the objectives of the Code are achieved.

areas where pesticides are employed. This calls for financial and other resources. The Food and Agriculture Organization, the World Health Organization, and other agencies have an important role in offering not only encouragement but also expert and material assistance to national authorities in the design and operation of reliable regulatory arrangements, tailored to local conditions. Experts from developed countries who have been engaged both administratively and practically in work of this kind can be seconded for this purpose. Training courses for prospective field workers or inspectors can also be provided.

Suicidal poisoning should be combated on the psychological, social and moral planes. Accidental poisoning must not be accepted as inevitable; in various countries where conscientious efforts are made to achieve safe use, accidents are few and seldom severe. As long as controls on the sale, supply and use of pesticides are inadequate, casualties will occur and full provision should be made for diagnosis and treatment.

Centres of toxicological excellence in principal cities are of limited value if their facilities are not readily accessible to practitioners in the field. Primary health care workers should be trained to recognize pesticide poisoning and to assess how and to what extent exposure may have come about. They should also be able to provide first aid

and continuing management. If antidotes exist, as with organophosphate poisoning, they should be available and the staff should be able to administer them. Specialized centres may prove invaluable in giving advice and should be readily accessible at all times of the day and night.

Yet it should never be forgotten that, with few exceptions, the treatment of over-exposure to pesticides is based on the general principles of nonspecific resuscitation. A patient should be removed from contact with the noxious substance. Contaminated clothing should be removed at once and contaminated areas of the skin should be thoroughly washed. The eyes, if affected, should be irrigated. Thereafter, management relies on sustaining the respiratory, cardiovascular, renal and fluid balance systems, and on overall supportive care. It should be possible for patients in a critical condition to be transferred to hospital without delay. Elaborate toxicological analyses are seldom called for at this stage but they may be required subsequently for confirmation of diagnosis. □

## Reference

1. **Levine, R. S.** *Assessment of mortality and morbidity due to unintentional pesticide poisonings.* Geneva, World Health Organization, 1986 (unpublished document WHO/VBC/86.929).