

will include mechanisms for swift and clear communication between the members, joint training activities, collaborative research projects, and mutual assistance on a wide variety of public health issues such as surveillance and outbreak investigation. In an increasingly globalized world, international collaboration between NPHIs is vital for success in any country and for global public health. The shared vision of the NPHI participants will now be put into operation through an association that facilitates partnership and collaboration. We believe this collaboration will improve public health throughout the world and be a legacy for future generations of public health professionals. ■

Conflicts of interest: none declared.

1. Collin J, Lee K. *Globalization and transborder health risk in the UK*. London: The Nuffield Trust; 2003.
2. *The world health report 2002 – Reducing risks, promoting healthy life*. Geneva: World Health Organization; 2002.
3. Beaglehole R, Yach D. Globalization and the prevention and control of noncommunicable disease: the neglected chronic diseases of adults. *Lancet* 2003;362:903-8.
4. McQueen D, Puska P, editors. *Global behavioural risk factor surveillance*. New York: Kluwer Academic/Plenum Publishers; 2003.
5. *Learning from SARS – Renewal of public health in Canada*. Ottawa: National Advisory Committee on SARS and Public Health; 2003.
6. *SARS in Hong Kong: an Expert Committee report*. 2003. Available from: www.sars-expercom.gov.hk
7. Beaglehole R, Bonita R. *Public health at the crossroads*. Cambridge: Cambridge University Press; 1997.

Missing deaths from pesticide self-poisoning at the IFCS Forum IV

Flemming Konradsen,^{1,2} Wim van der Hoek,² David Gunnell,³ & Michael Eddleston⁴

Since the middle of the last century, pesticides have become an integral component of the world's attempt to increase agricultural output and decrease vector-borne disease. However, the benefits of pesticides have come at a cost and their continued use is the frequent subject of debate.

The Intergovernmental Forum on Chemical Safety (IFCS), established in 1994 following the recommendations of the United Nations Conference on the Environment and Development (UNCED, the Earth Summit), was charged with identifying priorities for action on chemical safety and reducing the hazards associated with chemical use (1, 2). IFCS takes the position that substantial use of pesticides is essential to achieve sustainable development. It attempts, however, to find strategies to mitigate the adverse effects that pesticides may have on human health and the environment (1, 3).

IFCS's first meeting provided policy guidance and integrated strategies for implementation of the key areas that were adopted by UNCED in Agenda 21 (1, 2). Its subsequent meetings have evaluated the progress that has been made. In 2000, at Forum III, IFCS adopted the Bahia Declaration on Chemical Safety, which identified key goals with target dates for their achievement (4). This declaration was later endorsed by the United Nations Environment Programme (UNEP) Governing Council and forms an important basis for international efforts to manage chemical use. The most recent meeting — Forum IV — took place in Bangkok in November 2003 (5). Major topics for discussion included the safety of children, occupational safety and health, capacity building in the developing world, and acutely toxic pesticides.

This last subject is of particular concern. Since a report from WHO and UNEP in 1990 (6), the scale of the problem

caused by acutely toxic pesticides has been readily apparent. The report estimated that more than 3 million people were hospitalized for pesticide poisoning every year and that 220 000 died; it particularly noted that two-thirds of hospitalizations and the majority of deaths were attributable to intentional self-poisoning rather than to occupational or accidental poisoning.

Recent studies from Asia suggest that as many as 300 000 deaths from pesticide self-poisoning may occur in the Asia-Pacific region every year (7, 8). The easy availability and lack of safe storage of pesticides in the homes of the rural poor mean that many acts of self-harm, at moments of acute distress, have fatal and sometimes unintended consequences (8, 9).

Official documents from Forum IV invite assistance in the identification of gaps in the proposed strategies for chemical safety (3). Similar to many previous initiatives aimed at reducing the adverse effects of pesticides, the obvious gap is that there is no mention of the hundreds of thousands of deaths from pesticide self-poisoning that occur each year. Instead, the effort was directed towards occupational poisoning. IFCS appears to be overlooking the evidence on major pesticide mortality: a visit to any rural district hospital in Asia will demonstrate the enormity of the problem. A prospective study in Sri Lanka including 2257 poisoned patients admitted to two peripheral hospitals found that more than 95% of the patients with pesticide poisoning were cases of self-poisoning (Eddleston, submitted).

A working group was set up by Forum III to: "provide initial input on the extent of the problem of acutely toxic pesticides, and provide guidance for sound risk management and reduction, including options for phasing out where appropriate, and report to Forum IV" (10). It would seem reasonable — since pesticide self-poisoning is responsible for so many

¹ Department of International Health, Institute of Public Health, University of Copenhagen, Blegdamsvej 3, 2200 Copenhagen, Denmark. Correspondence should be sent to this author (email: f.konradsen@pubhealth.ku.dk).

² International Water Management Institute, Colombo, Sri Lanka.

³ Department of Social Medicine, University of Bristol, Bristol, England.

⁴ Centre for Tropical Medicine, Nuffield Department of Clinical Medicine, University of Oxford, Oxford, England, and Department of Clinical Medicine, University of Colombo, Colombo, Sri Lanka.

deaths — to include self-poisoning in the report, but the working group was asked to consider poisoning of pesticide users only, excluding self-poisoning, despite most self-poisoning deaths occurring in the farming communities that buy and use pesticides (8). Consequently, self-poisoning was not discussed in Forum IV.

There is scope to consider this matter within the Forum since pesticide self-poisoning was not excluded from its first report (1). Most health problems related to pesticides in many Asian countries follow self-poisoning, suggesting that they should be included in both the review and IFCS action. Furthermore, the original declaration from the Earth Summit covered all forms of poisoning, stating that “areas of risk reduction encompass the ... prevention of poisoning by chemicals”, not just occupational and accidental poisoning (2, section 19.46).

If the strategies and policies outlined in the IFCS Forum IV declaration are implemented, there is likely to be a reduction in the morbidity associated with occupational pesticide poisoning. A number of the actions proposed — phasing out the most toxic chemicals, promoting alternative pest management strategies, and improving safe storage — are also likely to have an effect on the number of self-poisoning cases (11). Nevertheless, the subject of self-harm needs to be dealt with directly: a strategy aimed specifically at preventing self-poisoning would differ in emphasis from a strategy to reduce occupational poisoning. Since self-poisoning results in far more serious illness than occupational poisoning, the capacity for treatment at health facilities in resource-poor countries must be improved (8, 12). Provision and correct use of effective antidotes in small rural health centres and ventilators in district hospitals, together with the development of evidence-based guidelines, will reduce the number of deaths that occur after presentation to hospital.

Clearly, the issues of self-harm are psychosocially, economically, culturally and politically complex and go beyond the question of pesticides. Prevention campaigns combining social and mental health sectors with the agricultural sector may have an impact on cases of severe poisoning and excessive mortality. In international treaties, there is need for explicit inclusion of self-poisonings in risk assessments, with development of recommendations for restrictions of sales and marketing of particular formulations and concentrations (13, 14).

We call upon IFCS to recognize that globally most pesticide deaths occur following self-poisoning. Self-poisoning needs to be acknowledged as a major problem of chemical safety — one that affects pesticide-using communities in the developing world and one that can be reduced with concentrated effort (8, 11). Perhaps greater involvement of WHO and ministries of health, not just ministries of agriculture or environment, in drawing up treaties such as the Rotterdam Convention (15) will improve understanding of these important health issues. ■

Acknowledgements

We thank John Haines and Nida Besbelli for critical review of the manuscript. ME is a Wellcome Trust Career Development Fellow, funded by grant GR063560MA.

Conflicts of interest: none declared.

1. International Programme on Chemical Safety. *The International Conference on Chemical Safety. Stockholm, Sweden, 25–29 April 1994. Final Report.* Geneva: World Health Organization; 1994. WHO document IPCS/ICCS/94.8. Available from: http://www.who.int/ifcs/Documents/Forum/ForumI/Fl-report_en.pdf
2. United Nations Conference on the Environment and Development. *Agenda 21. Chapter 19, Environmentally sound management of toxic chemicals, including prevention of illegal international traffic in toxic and dangerous products.* Geneva: United Nations Department of Economic and Social Affairs; 1992. Available from: <http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21chapter19.htm>
3. Intergovernmental Forum on Chemical Safety. *Chemical safety in a vulnerable world. Forum IV. Fourth session of the Intergovernmental Forum on Chemical Safety, Bangkok, Thailand, 1–7 November 2003. Strategic approach to international chemicals management (SAICM). Forum IV thought starter report to SAICM PrepCom1, 9–13 November 2003.* Geneva: Intergovernmental Forum on Chemical Safety; 2004. WHO document IFCS/FORUM-IV/13w Rev 2. Available from: http://www.who.int/ifcs/Forums/ForumIV/Meet_docs.htm
4. Intergovernmental Forum on Chemical Safety. *In partnership for global chemical safety. Forum III. Third session of the Intergovernmental Forum on Chemical Safety, Salvador da Bahia, Brazil, 15–20 October 2000. Final report.* Geneva: Intergovernmental Forum on Chemical Safety; 2000. WHO document IFCS/FORUM III/23w. Available from: <http://www.who.int/ifcs/Documents/Forum/ForumIII/f3-finrepdoc/Part1.pdf>
5. Intergovernmental Forum on Chemical Safety. *Chemical safety in a vulnerable world. Forum IV. Fourth session of the Intergovernmental Forum on Chemical Safety, Bangkok, Thailand, 1–7 November 2003. Final report. Executive summary.* Geneva: Intergovernmental Forum on Chemical Safety; 2004. WHO document IFCS/FORUM IV/16w. Available from: <http://www.who.int/ifcs/Forums/ForumIV/FIVreport.htm>
6. *Public health impact of pesticides used in agriculture.* Geneva: World Health Organization and United Nations Environment Programme; 1990.
7. Phillips MR, Yang G, Zhang Y, Wang L, Ji H, Zhou M. Risk factors for suicide in China: a national case-control psychological autopsy study. *Lancet* 2002;360:1728–36.
8. Eddleston M, Phillips MR. Self-poisoning with pesticides. *BMJ* 2004;328:42–4.
9. Li XY, Yu YC, Wang YP, Yang RS, Zhang C, Ji HY, et al. Characteristics of serious suicide attempts treated in general hospitals. *Chinese Journal of Mental Health* 2002;16:681–4.
10. Forum standing committee working group. *Chemical safety in a vulnerable world. Forum IV. Fourth session of the Intergovernmental Forum on Chemical Safety, Bangkok, Thailand, 1–7 November 2003. Acutely toxic pesticides. Initial input on extent of problem and guidance for risk management.* Geneva: Intergovernmental Forum on Chemical Safety; 2004. WHO document IFCS/FORUM-IV/10w. Available from: http://www.who.int/ifcs/Forums/ForumIV/Meet_docs.htm
11. Gunnell D, Eddleston M. Suicide by intentional ingestion of pesticides: a continuing tragedy in developing countries. *International Journal of Epidemiology* 2003;32:902–9.
12. Eddleston M. Patterns and problems of deliberate self-poisoning in the developing world. *The Quarterly Journal of Medicine* 2000;93:715–31.
13. Konradsen F, van der Hoek W, Cole DC, Hutchinson G, Daisley H, Singh S, et al. Reducing acute poisoning in developing countries – options for restricting the availability of pesticides. *Toxicology* 2003;192:249–61.
14. Roberts DM, Karunaratna A, Buckley NA, Manuweera G, Sheriff MHR, Eddleston M. Influence of pesticide regulation on acute poisoning deaths in Sri Lanka. *Bulletin of the World Health Organization* 2003;81:789–98.
15. *The Rotterdam Convention on the Prior Informed Consent procedure for certain hazardous chemicals and pesticides in international trade.* Geneva: World Health Organization/United Nations Environment Programme/Food and Agriculture Organization; 1998. Available from: <http://www.pic.int/index.html>