

Building capacity to address emerging problems in developing countries: intentional self-poisoning and pesticides

RUWAN RATNAYAKE

Ruwan Ratnayake is currently with the WHO Collaborating Centre for Research on the Epidemiology of Disasters (CRED), Brussels, Belgium. This essay was written while he was an independent research consultant. The views expressed here are solely the responsibility of the author and not of CRED.

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Correspondence: Ruwan Ratnayake, rratnaya@jhsph.edu

IF YOU MENTION THE PHENOMENON OF pesticide poisoning in developing countries to well-informed health advocates, it is likely that the 1984 industrial disaster in Bhopal, India, will come to mind. In Bhopal, a Union Carbide pesticide plant leaked 40 tonnes of methyl isocyanate gas into the environment, leading to at least 15 000 deaths over the next 20 years.¹ What is not so well known is that intentional self-poisoning by pesticide ingestion has become an enduring epidemic that is estimated to result in 250 000 to 370 000 deaths annually, predominantly in Asia.² This means that in some areas of the developing world, pesticide poisoning, including self-poisoning, is responsible for more deaths than infectious diseases.³

The World Health Organization (WHO) recently identified pesticide ingestion as the most common method of suicide in the world and stated that its prevention is a priority.⁴ However, this is one of the most convoluted issues for public health systems in developing countries and it remains poorly understood and largely overlooked. These problems are exacerbated by the difficulty in raising the profile of mental health in the global public health community. The importance of

the factors that contribute to pesticide self-poisoning — the availability of the toxic agent and the impulsivity that leads someone to commit the act — is not fully understood across cultures, but pesticide ingestion may not be substantially different from self-poisoning behaviours in industrialized countries. One significant difference, however, is that pesticides are much more toxic than the medicinal and illicit drugs used most often for self-harm in industrialized countries,⁵ and survival in rural areas is further impeded because of limited access to effective treatment. Michael Eddleston, a leading investigator of the phenomenon, describes the situation in Sri Lanka like so: “In a moment of extreme stress — when the crops fail, when constraints and losses imposed by the war seem insurmountable, there are enough reasons at times — people just grab the nearest thing and drink it.”⁶ The nearest thing in such circumstances is often not prescription drugs but rather highly toxic pesticides, which cause muscle paralysis, respiratory arrest requiring ventilation, and injuries that result in long-lasting social, functional and economic problems for individuals and communities.

The phenomenon has been investigated to a considerable extent in Sri Lanka. On the surface, a self-poisoning incident appears to be triggered by an acute interpersonal crisis, such as by a romantic partner or a dispute with a family member. However, the triggering crisis can also be the breaking point in an accumulation of frustrations linked to social factors, including poverty, lack of economic opportunities, and a sense of social injustice.⁷ To add to this complexity, community-based studies in Sri Lanka have found that self-poisoning is not always associated with a clear desire to end one’s life but, rather, with a variety of motivations, including shame, rage and a desire to frighten others.^{8,9} It is thus conceivable that the combination of widespread availability of toxic pesticides, an environment lacking in opportunity, and the apparent normalization of self-harm as a response to stress may begin to explain the pervasiveness of self-poisoning in agricultural communities.

A tenuous balance

The challenge in addressing pesticide self-poisoning lies in balancing the economic needs of agricultural societies that depend on pesticide use, the financial

interests of the pesticide industry, and public health. Developing countries in which agricultural workers make up more than half of the workforce are, in turn, dependent on cheap and effective pest-control measures. Historically, such countries have relied on the most noxious class I pesticides, which have been prohibited or heavily regulated in industrialized countries.³ A tool that developing countries can use to regulate the import and use of pesticides is the International Code of Conduct on the Distribution and Use of Pesticides, a policy set out by the Food and Agriculture Organization of the United Nations.³ However, government ministries alone may not have the capacity to fully implement these recommendations. Rather, governments have relied on the pesticide industry to voluntarily adopt safety measures.

Legislative restrictions on pesticide formulation and use can also help to prevent occupational poisoning among agricultural workers. Cooperation between governmental, intergovernmental, non-governmental and industry-based stakeholders appears to be essential in building capacity to make such legislative changes and in developing a comprehensive plan of action that can fully realize the sweeping influence that legislative restrictions can have on prevention.

Developing capacity to address the issue

Developing cohesive, national-level strategies to control access to pesticides, support the use of alternative pest-control options, protect the well-being of rural communities and determine the culture-based determinants of self-harming behaviour requires a formidable strengthening of capacity at all levels. Which sectors need to collaborate to ensure that well-informed decisions are made and to bolster support for preventive efforts?

First, governments play a key role in creating national priorities, regulating the import and use of pesticides, supporting the use of alternative approaches that reduce reliance on pesticides (such as integrated pest management) and improving the medical infrastructure in rural settings. For example, the Sri Lankan government's efforts to restrict class I and II pesticides in the mid to late 1990s may be a success story, as these efforts coincide with a 50% reduction in suicide across age groups for both men and women.¹⁰

Second, intergovernmental bodies such as the WHO and other United Nations agencies are instru-

mental in strengthening the capacity of developing-country governments through their ability to enact consensus statements among member states. One such idea involves the creation of a minimum pesticides list, akin to the WHO's model list of essential medicines, which would compare the most necessary and safe pesticides and provide an unbiased instrument that governments could use to decide which pesticides are suitable for import.³

Third, the pesticide industry clearly has a major role to play in minimizing the hazards of its products through a range of means, including improved labeling and distribution practices and substantial reductions in pesticide toxicity. More recently, there appears to be some agreement between industry and the WHO on restricting access to pesticides within communities through the use of locked storage boxes. This approach could increase the power of communities to enact local safety measures, but some have warned that a reliance on storage boxes carries its own risks (such as shifting the storage of pesticides from the field to the household) and should not be considered separately from other measures that encourage reduced reliance on pesticides.¹¹

Finally, research partnerships between northern and southern institutions are working to understand pesticide self-poisoning and develop the methods for its prevention. With funding from the Wellcome Trust, researchers from Sri Lanka, British and Australian universities have used rigorous field approaches to examine the spectrum of self-poisoning in Sri Lanka, including its epidemiology, toxicology, prevention, medical management and policy implications (for details see www.sactrc.org). Such work is generating the evidence base needed for effective and measured action as well as an instructive country study. One of many innovations to develop from these collaborations has been a randomized control trial of the use of multiple-dose activated charcoal to treat acute self-poisoning.¹² This simple, low-cost compound was believed to reduce the bodily absorption of ingested pesticides and is widely available in developing countries. Although the trial results indicate no significant difference in outcome between groups, the reasoning behind the study hypothesis highlights the critical need for accessible, inexpensive and effective therapies that can be used in rural hospitals with scarce resources.

The importance of recognizing mental well-being

Although the particular relationship between mental illness and pesticide self-poisoning in rural communities is contentious, understanding the basis for impulsive decision-making in times of crisis seems essential. The lack of understanding of mental health and the lack of infrastructure for mental health services are sorely apparent in many countries. Given the potential for survivors of pesticide self-poisoning to relapse, governments may consider making the investigation of evidence-based support services a priority amid the general scaling-up of the infrastructure for mental health care and rural health care. Non-governmental organizations, such as Sri Lanka's Sumithrayo and India's Sneha, have been successful in bringing self-poisoning, mental well-being and social support to light, providing novel and culturally sensitive approaches to rural outreach work and engaging in community-based research on prevention and help-seeking behaviour.^{13,14} Further community-driven studies of the social, cultural and psychological determinants of self-poisoning are clearly needed. Ultimately, unraveling the mystery of why people choose to harm themselves is crucial if we are to curtail the tragic decision-making that leads a person to turn to pesticides.

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