Capacity-building for emerging problems: intentional self-poisoning and pesticides

Word count: 1,133 (without References)

If you mention the phenomenon of pesticide poisoning in developing countries to well-informed health advocates, the 1984 Bhopal disaster will likely be brought to mind. In Bhopal, a Union Carbide pesticide plant leaked 40 tons of methyl isocyanate gas into the environment, leading to the deaths of at least 18,000 people over the last 23 years [1,2]. What is not so apparent, is that *intentional* self-poisoning by pesticide ingestion has become an enduring epidemic which is estimated to result in 300,000 deaths annually in China and South-East Asia alone [3]. This toll excludes deaths in other South Asian, African, South and Central American and Caribbean nations where the burden has not been as clearly quantified. To put that into perspective, this means that in some areas of the developing world, pesticide poisoning, including self-poisoning, accounts for greater mortality than infectious disease [4].

The World Health Organization (WHO) has recently acknowledged that pesticide ingestion is the most common method of suicide worldwide and has stated that its prevention is a priority [5]. Yet it is one of the most convoluted issues for public health in developing countries and remains poorly understood, largely overlooked and under-resourced. These problems are exacerbated by the difficulty of raising the profile of mental health on the global public health agenda. The importance of its contributing factors – the availability of the toxic agent and impulsivity to commit the act – is not fully understood across cultures, but it may not be substantially different from self-poisoning behaviors in industrialized countries. The difference is that pesticides are much more toxic than the medicinal and illicit drugs used most often for self-harm in industrialized countries [3] and survival is further impeded by reduced access to effective treatment in rural areas. As Dr. Michael Eddleston, a pioneering investigator of the phenomenon expresses of the situation in Sri Lanka, *"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"* [7]. And in rural areas, the nearest thing is not often prescription drugs, but highly toxic pesticides that cause muscle paralysis, respiratory arrest requiring ventilation and injuries resulting in long-lasting social, functional and economic problems for individuals and communities.

A tenuous balance
The challenge lies in balancing, on one side, the economic welfare of agricultural societies that are dependant on pesticide use, and on the other, the influences of the pesticide industry's financial priorities on the public's health. Countries like Sri Lanka, where agriculture employs more than half of the workforce, are largely rural and therefore dependant on cheap and effective pest-control approaches. Such countries have historically relied on the most noxious Class I pesticides that have been prohibited or heavily regulated for use in industrialized countries [4]. A

major tool used by developing countries to regulate pesticide import and use is the International Code of Conduct on the Distribution and Use of Pesticides, a policy set out by the United Nations Food and Agriculture Organization [4]. However, governments and ministries of health may not have the capacity to fully implement the recommendations as policies. In actual fact, governments often rely on the pesticide industry to voluntarily adopt safety measures, including the downscaling of its own products.

Developing capacity to address the issue

Developing cohesive, national-level strategies to control access to pesticides, support alternative pest-control options, protect the well being of rural communities and develop cultural explanations for self-harming behaviors requires a formidable strengthening of capacity at all levels. What sectors need to collaborate in order to ensure well-informed decisions and bolster the environment for prevention?

 Governments play the key role in creating national priorities, regulating the import and use of pesticides, supporting alternative approaches that reduce reliance on pesticide use (such as Integrated Pest Management) and improving the medical infrastructure in rural settings. For instance, the restriction of pesticides that have been linked to excessive poisoning deaths has been a success story, with subsequent mortality reductions recorded in Jordan and Western Samoa [3]. *Intergovernmental bodies*, namely United Nations agencies and the WHO are instrumental 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 essential drug list - that would compare the most necessary and safe pesticides and provide an unbiased instrument for governments to decide which pesticides are suitable for import [4].

 The *pesticide industry* themselves clearly have a major role in minimizing the hazards of their own products through a range of means, including improved labeling and distribution practices and substantial reductions to pesticide toxicity. For instance, there appears to be some agreement among industry and the WHO on the potential for restricting access within communities using locked boxes to store pesticides. This approach could increase the power of communities in enacting safety measures locally but, as some have warned, the reliance on boxes carries its own risks (such as shifting the storage of pesticides from the field to the household) and should not be considered apart from other measures which favor reduced reliance on pesticides [6].

 Another productive sector working to understand and advocate for the phenomenon are the *research partnerships* between Northern and Southern institutions. Using rigorous field approaches, researchers from the Universities of Oxford, UK and Colombo, Sri Lanka have examined the spectrum of self-poisoning in Sri Lanka including its epidemiology, toxicology, prevention, medical management and policy implications. This provides a workable country study for governments to reflect on and generates the missing evidence-base needed for effective and measured action. One of many innovative developments from this

collaboration has been a randomized control trial of activated charcoal for the treatment of acute self-poisoning in Sri Lanka [7]. This simple, low-cost compound greatly reduces the bodily absorption of ingested pesticides and is widely available across communities in developing countries.

The importance of recognizing mental well being
While the specific relationship between mental illness and pesticide self-poisoning in non-Western societies is contentious, understanding the basis for impulsive decision-making in times of crisis seems essential. The lack of knowledge, infrastructure and understanding of mental health in many countries is sorely apparent, as is the need for local research into the psychological and social factors affecting self-poisoning. *Non-governmental organizations,* including Sri Lanka's Sumithrayo and India's Sneha, have been successful in bringing suicide and mental illness to light and reducing stigma within communities through outreach work and involvement in community-based, locally-derived research. Unraveling the mystery of why people choose to self-harm is crucial in curtailing the tragic decision-making that enables a person to turn to pesticides in the first place.

References (formatted to ensure blind review)

1. Broughton E, 2005.
2. BBC, 2004.
3. Gunnell D & Eddleston M, 2003.
4. Eddleston M, Karalliedde L, Buckley N, et al., 2002.
5. Bertolote JM, Fleischmann A, Butchart A, et al., 2006.
6. Konradsen F, Pieris R, Weerasinghe M, et al., 2007.
7. Wellcome Trust, 2007.