

WHO pesticide regulations should be based on toxicity in humans, not rats

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Current WHO pesticide classifications are based on toxicity in rats but basing regulation on human toxicity will make pesticide poisoning less hazardous and prevent hundreds of thousands of deaths globally without compromising agricultural needs. These are the key findings from a study by Andrew Dawson (South Asian Clinical Toxicology Research Collaboration, University of Peradeniya, Sri Lanka) and colleagues published in this week's *PLoS Medicine*.

The single most common means of suicide worldwide is agricultural pesticide poisoning. The authors examined the proportion of patients dying (case fatality) of different agricultural pesticides among patients who presented with pesticide self-poisoning at two Sri Lankan referral hospitals. Between April 2002 and November 2008, 9,302 people were admitted to the hospitals after ingesting a single pesticide. The authors identified the pesticide ingested in 7,461 cases by asking the patient what he/she had taken or by identifying the container brought in by the patient or their relatives. Ten percent of the patients died but there was a large variation in case fatality between the pesticides taken. Compounds in the same chemical class and/or the same WHO toxicity class sometimes had very different toxicities. For example, dimethoate and malathion, both class II organophosphate insecticides, had case fatalities of 20.6% and 1.9%, respectively. Similarly, pesticides used for similar agricultural purposes sometimes had very different case fatalities.

These important findings are likely to be generalizable to other hospitals and to other parts of rural Asia as the systematically collected prospective human data enable reliable estimates of relative toxicity for pesticides.

The authors say that "the data are much more directly relevant to human risk assessment than the existing animal data from which the WHO/EPA classifications of toxicity used in regulation are

derived." They continue: "Moreover, it provides evidence of very large differences in acute human toxicity within these widely used classifications. These data provide a basis for refining further public health, regulatory, and clinical responses to the problem of acute pesticide poisoning. "

In an accompanying Perspective on the research article, Matthew Miller and Kavi Bhalla from the Harvard School of Public Health, Boston, USA (uninvolved in the research), call for urgent reclassification of agricultural pesticides to help reduce suicides by pesticide poisoning.

They say: "The findings from the current study by Dawson and colleagues have helped refine human toxicity estimates for pesticides in use today. Better surveillance data and additional research will, eventually, lead to additional refinements. In the meantime, while we wait for these refinements, we must not ignore what, thanks to Dawson and colleagues, we already know."

More information: Dawson AH, Eddleston M, Senarathna L, Mohamed F, Gawarammana I, et al. (2010) Acute Human Lethal Toxicity of Agricultural Pesticides: A Prospective Cohort Study. *PLoS Med* 7(10): e1000357.
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