Bibliography: Topic - Overviews
Self-poisoning with pesticides accounts for about a third of all suicides worldwide. To tackle this problem, the World Health Organization announced a global public health initiative in the second half of 2005. Planned approaches were to range from government regulatory action to the development of new treatments for pesticide poisoning. With broad-based support, this strategy should have a major impact on the global burden of suicide.

1. Pesticide poisoning kills hundreds of thousands of people in the Asia-Pacific region each year. The majority of deaths are from deliberate self-poisoning with organophosphorus pesticides (OP), aluminium phosphide and paraquat. The current response from a public health, medical and research perspective is inadequate. 2. There are few proven or effective treatments; in addition, very little clinical research has been performed to transfer antidotes shown to work in animal studies into clinical practice. 3. The human toxicity of pesticides is poorly studied and better information may inform a more sustained and appropriate regulatory response. Further understanding may also lead to improvements in diagnosis and treatment. 4. The few effective treatments are not being recommended or delivered in an optimal and timely fashion to poisoned patients. A regional approach to facilitate appropriate pricing, packaging and delivery of antidotes is required.


BACKGROUND: Nonfatal, deliberate self-harm (DSH), particularly with pesticides, is a major public health problem in many developing countries of the world. Agriculture is the primary occupation of most people living in the Sundarban region in West Bengal, India. Pesticides are extensively used in agriculture and these agents are most frequently used in DSH. AIM: This study sought to identify the nature of methods and agents used in nonfatal DSH attempts in the Sundarban area under South 24 Parganas district of West Bengal. MATERIALS AND METHODS: Detailed demographic and clinical data on DSH cases of 13 Block Primary Health Centres (BPHCs') admission registers were analysed. Focus Group Discussions (FGDs) were conducted with the Panchayat Samithy of each block to elicit their perception about the problem of pesticide-related DSH or suicide in the region. RESULTS: Five thousand, one hundred and seventy-eight (1,887 male and 3,291 female) subjects were admitted in the BPHCs during the study period from 1999 to 2001. Organophosphorous pesticide poisoning was found to be the most common method (65.1%) in DSH. This emphasizes the importance of developing an urgent poisoning prevention program with a special focus
on improving clinical services as well as initiating farmers' education programs focusing on safe pesticide practices at the primary care level.

Dally, S. (2000). "[Non-accidental criminal poisonings]." Rev Prat 50(4): 407-409. Among the different types of chemical aggressions, murder is very rare. Most cases are less straightforward: "jokes", ill-wills, impulsive acts... Pesticides, metals, household products and illicit drugs are most often in cause, in addition to self-defence sprays. Intoxication may be suspected by the victim, in which case paranoia should be eliminated. In other cases, unusual circumstances or symptoms are suspected by the physician. The toxicological analysis must be guided by the clinical context.

Dawson, A. H. and N. A. Buckley (2011). "Toxicologists in public health - Following the path of Louis Roche (based on the Louis Roche lecture "an accidental toxicologist in public health", Bordeaux, 2010)." Clinical Toxicology 49 (2): 94-101. Background. The global burden of clinical toxicology suggests a natural partnership with public health. This article reflects the content of a Louis Roche lecture given in 2010. Historical context. Our practice and research in clinical toxicology has evolved from clinical cases to toxico-epidemiology to public health. This evolution in practice was initially unplanned but gained momentum and impact as we placed it more formally in a public health framework. This perspective is implicit in Louis Roche's call to "examine all aspects of the poisoning problem" and still provides a valuable starting point for any clinical toxicologist. Discussion. Clinical toxicology has always had a patient centered focus but its greatest successes have been related to public health interventions. Our early failures and later success in public health toxicology correlated with our understanding of the importance of partnerships outside our field. The most rapid dissemination and implementation of information derived from research occur through a priori partnerships with other agencies and international partners. Conclusion. Addressing both local and global need has a number of bilateral synergies. Repositioning clinical toxicology into a public health framework increases access to strategic partnerships, research funds, and policy implementation while still addressing questions that are important to clinical practice. 2011 Informa Healthcare USA, Inc.

Eddleston, M. (2000). "Patterns and problems of deliberate self-poisoning in the developing world." QJM 93(11): 715-731. Deliberate self-harm is a major problem in the developing world, responsible for around 600 000 deaths in 1990. The toxicity of available poisons and paucity of medical services ensure that mortality from self-poisoning is far greater in the tropics than in the industrialized world. Few data are available on the poisons most commonly used for self-harm in different parts of the world. This paper reviews the literature on poisoning, to identify the important poisons used for self-harm in these regions. Pesticides are the most important poison throughout the tropics, being both common and associated with a high mortality rate. In some regions, particular pesticides have become the most popular method of self-harm, gaining a notoriety amongst both health-care workers and public. Self-poisoning with medicines such as benzodiazepines and antidepressants is common in urban areas, but
associated with few deaths. The antimalarial chloroquine appears the most significant medicine, self-poisoning being common in both Africa and the Pacific region, and often fatal. Paracetamol (acetaminophen) is used in many countries but in few has it reached the popularity typical of the UK. Domestic and industrial chemicals are responsible for significant numbers of deaths and long-term disabilities world-wide. Self-poisoning with plant parts, although uncommon globally, is locally popular in some regions. Few of these poisons have specific antidotes. This emphasizes the importance of determining whether interventions aimed at reducing poison absorption actually produce a clinical benefit, reducing death and complication rates. Future research to improve medical management and find effective ways of reducing the incidence of self-harm, together with more widespread provision of interventions proven to be effective, could rapidly reduce the number of deaths from self-poisoning in the developing world.


BACKGROUND: Although more than 100 organophosphorus insecticides exist, organophosphorus poisoning is usually regarded as a single entity, distinguished only by the compound's lethal dose in animals. We aimed to determine whether the three most common organophosphorus insecticides used for self-poisoning in Sri Lanka differ in the clinical features and severity of poisoning they cause. METHODS: We prospectively studied 802 patients with chlorpyrifos, dimethoate, or fenthion self-poisoning admitted to three hospitals. Blood cholinesterase activity and insecticide concentration were measured to determine the compound and the patients' response to insecticide and therapy. We recorded clinical outcomes for each patient. FINDINGS: Compared with chlorpyrifos (35 of 439, 8.0%), the proportion dying was significantly higher with dimethoate (61 of 264, 23.1%, odds ratio [OR] 3.5, 95% CI 2.2-5.4) or fenthion (16 of 99, 16.2%, OR 2.2, 1.2-4.2), as was the proportion requiring endotracheal intubation (66 of 439 for chlorpyrifos, 15.0%; 93 of 264 for dimethoate, 35.2%, OR 3.1, 2.1-4.4; 31 of 99 for fenthion, 31.3%, 2.6, 1.6-4.2). Dimethoate-poisoned patients died sooner than those ingesting other pesticides and often from hypotensive shock. Fenthion poisoning initially caused few symptoms but many patients subsequently required intubation. Acetylcholinesterase inhibited by fenthion or dimethoate responded poorly to pralidoxime treatment compared with chlorpyrifos-inhibited acetylcholinesterase. INTERPRETATION: Organophosphorus insecticide poisoning is not a single entity, with substantial variability in clinical course, response to oximes, and outcome. Animal toxicity does not predict human toxicity since, although chlorpyrifos is generally the most toxic in rats, it is least toxic in people. Each organophosphorus insecticide should be considered as an individual poison and, consequently, patients might benefit from management protocols developed for particular organophosphorus insecticides.

In parts of the developing world, pesticide poisoning causes more deaths than infectious diseases. Use of pesticides is poorly regulated and often dangerous; their easy availability also makes them a popular method of self-harm. In 1985, the UN Food and Agriculture Organisation (FAO) produced a voluntary code of conduct for the pesticide industry in an attempt to limit the harmful effects of pesticides. Unfortunately, a lack of adequate government resources in the developing world makes this code ineffective, and thousands of deaths continue today. WHO has recommended that access to highly toxic pesticides be restricted—where this has been done, suicide rates have fallen. Since an Essential Drugs List was established in 1977, use of a few essential drugs has rationalised drug use in many regions. An analogous Minimum Pesticides List would identify a restricted number of less dangerous pesticides to do specific tasks within an integrated pest management system. Use of safer pesticides should result in fewer deaths, just as the change from barbiturates to benzodiazepines has reduced the number of deaths from pharmaceutical self-poisoning.


Organophosphorus (OP) insecticide self-poisoning is responsible for about one-quarter of global suicides. Treatment focuses on the fact that OP compounds inhibit acetylcholinesterase (AChE); however, AChE-reactivating drugs do not benefit poisoned humans. We therefore studied the role of solvent coformulants in OP toxicity in a novel minipig model of agricultural OP poisoning. Gottingen minipigs were orally poisoned with clinically relevant doses of agricultural emulsifiable concentrate (EC) dimethoate, dimethoate active ingredient (AI) alone, or solvents. Cardiorespiratory physiology and neuromuscular (NMJ) function, blood AChE activity, and arterial lactate concentration were monitored for 12h to assess poisoning severity. Poisoning with agricultural dimethoate EC40, but not saline, caused respiratory arrest within 30 min, severe distributive shock and NMJ dysfunction, that was similar to human poisoning. Mean arterial lactate rose to 15.6 [SD 2.8] mM in poisoned pigs compared to 1.4 [0.4] in controls. Moderate toxicity resulted from poisoning with dimethoate AI alone, or the major solvent cyclohexanone. Combining dimethoate with cyclohexanone reproduced severe poisoning characteristic of agricultural dimethoate EC poisoning. A formulation without cyclohexanone showed less mammalian toxicity. These results indicate that solvents play a crucial role in dimethoate toxicity. Regulatory assessment of pesticide toxicity should include solvents as well as the AIs which currently dominate the assessment. Reformulation of OP insecticides to ensure that the agricultural product has lower mammalian toxicity could result in fewer deaths after suicidal ingestion and rapidly reduce global suicide rates.

**Background.** Road traffic crashes are considered by the WHO to be the most important global cause of death from injury. However, this may not be true for large areas of rural Asia where road vehicles are uncommon. The issue is important, since emphasizing the importance of road traffic crashes risks switching resources to urban areas, away from already underfunded rural regions. In this study, we compared the importance of road traffic crashes with other forms of injury in a poor rural region of South Asia. Methodology

**Principal Findings.** We collated data on all deaths from injury in the North Central Province of Sri Lanka (NCP population 1,105,198 at 2001 census) over 18 months using coronial, hospital, and police data. We calculated the incidence of death from all forms of intentional and unattentional injury in the province. The annual incidence of death from injury in the province was high: 84.2 per 100,000 population. Half of the deaths were from self-harm (41.3/100,000). Poisoning (35.7/100,000) - in particular, pesticide self-poisoning (23.7/100,000) - was the most common cause of death, being 3.9-fold more common than road traffic crashes (9.1/100,000). Conclusions/Significance. In poor rural regions of South Asia, fatal self-harm and pesticide self-poisoning in particular are significantly more important than road traffic injuries as a cause of death. It is possible that the data used by the WHO to calculate global injury estimates are biased towards urban areas with better data collection but little pesticide poisoning. More studies are required to inform a debate about the importance of different forms of injury and how avoidable deaths from any cause can be prevented. In the meantime, marked improvements in the effectiveness of therapy for pesticide poisoning, safer storage, reduced pesticide use, or reductions in pesticide toxicity are required urgently to reduce the number of deaths from self-poisoning in rural Asia. 2007 Eddleston et al.


**BACKGROUND:** Suicide is a major public health concern. This investigation assessed elderly patients treated for self-intoxication in a poisoning referral center. **METHODS:** A retrospective and descriptive study was performed from the point of view of demographic, psychiatric and clinical factors related to the self-poisoning for suicide attempts in subjects aged over 65 years. **RESULTS:** The examined population consisted of 43 subjects including 30 males and 13 females with an age of 65 to 83 years (mean age = 72.5 years in males and 73.5 years in females). The majority of subjects were retired [35(81.4%)] and, many cases lived with their family [39(90.6%)]. 27.9% of subjects had been undergoing psychiatric treatment. Depressive disorders (reactive) and endogenic depression (affective) were recognized in 8 subjects (66.7%). 51% suffered from chronic diseases including hypertension (33.3%), coronary artery decease (30.4%), chronic obstructive pulmonary disease (15.9%) and diabetes (10.1%). Two cases had a history of previous suicidal attempt. The most frequently used substances in the attempts were medications (58%), opioids (23.2%), pesticide (11.6%) methanol (4.6%) and hair remover (2.3%). The mean duration of hospitalization was 1.3 days.
CONCLUSIONS: The high rate of depression and chronic diseases in elderly with suicidal attempt necessitates preventive interventions.


The differential diagnosis of all patients with altered mental status must include drug toxicity. In particular, intentional or unintentional overdosing and or poisoning are common emergency department presenting complaints. A comprehensive approach to managing these patients must incorporate aggressive information gathering, a careful physical examination looking for toxic syndromes, and diagnostic testing. Proper decontamination is the key to effective management, as is the use of specific antidotes when indicated.


Suicide is an important contributor to premature mortality accounting for over 800,000 deaths worldwide every year. Environmental and genetic factors acting from before birth to old age affect an individual's risk of suicide. Risk is influenced not only by psychiatric illness and impulsive behaviour but also by factors such as the cultural acceptability of suicide, the ease of availability of lethal suicide methods, help-seeking behaviours in times of crisis and access to effective treatments following self-harm. Suicide prevention programmes might usefully focus on two discrete areas: the prevention of the psychiatric illnesses that precede suicide and tackling those risk factors particular to suicide such as media influences, help-seeking, the availability of methods and the medical management of self-harm.


BACKGROUND: Whereas German suicide rates had a clear decreasing tendency between 1991 and 2006, they increased from 2007 to 2010. Deeper analyses of suicide data might help to understand better this change. The aim of this study was to analyze 1) whether recent trends can be related to changes in specific suicide methods and diverge by gender and age; 2) whether the decrease of suicide rates before 2007 as well as the increase from 2007 to 2010 are driven by the same suicide method. METHODS: Analyses were based on suicide data from the Federal Statistical Office of Germany. For 1998–2010, 136,583 suicide cases of men and women with known age and suicide method could be identified. These data were analyzed by joinpoint regression analysis, allowing identification of the best fitting point in time ("joinpoint") at which the suicide rate significantly changes in magnitude or direction. RESULTS: The national downward trend between 1998 and 2007 was mainly due to corresponding changes in self-poisoning by other means than drugs (e.g., pesticides) (annual percentage change (APC) <= -4.33), drowning (APC <= -2.73), hanging (APC <= -2.69) and suicides by firearms (APC <= -1.46) in both genders. Regarding the overall increase of age-adjusted suicide rates in Germany 2007–2010, mainly the
increase of self-poisoning (e.g., by drugs) and "being overrun" (APC \(\geq 1.50\)) contributed to this trend. LIMITATIONS: The true suicide rates might have been underestimated because of errors in the official death certificates. CONCLUSIONS: Increase in suicide rates in Germany since 2007 went along with corresponding changes for "being overrun" and "self-poisoning". Copycat suicides following the railway suicide of the goalkeeper Robert Enke partly contributed to the results. Thus, prevention of Werther effects and limitation of the availability of high pack sizes for drugs are of special relevance for the reversal of this trend.


Organophosphorus agents are used world wide in increasing quantities for the control of insects affecting agriculture. These agents are used also for disease vector control. OP agents became important during World War II for their potential use in chemical warfare. Disease in man caused by these agents is causing much concern, particularly in the developing agricultural countries. OP compounds produce toxicity following systemic absorption from the skin and mucous membranes. Ingestion with suicidal intent or accidentally following contamination of food by these agents is a common mode of intoxication. Intoxication associated with occupational exposure (formulating, mixing, handling, spraying) usually follows absorption either through the skin or by inhalation. The acute cholinergic crisis which immediately follows intoxication is caused by phosphorylation and inhibition of AChE. The muscarinic and nicotinic manifestations of ACh accumulation produce a clinical syndrome which frequently requires urgent resuscitation and therapy in intensive care units. The need for ventilatory care following recovery from the cholinergic phase was emphasized recently following recognition of the 'Intermediate Syndrome' (IMS). The IMS corresponds closely to the sequence of myopathic changes observed in animal experiments following OP intoxication. Delayed polyneuropathy caused possibly by ageing of the phosphorylated NTE occurs usually 2-4 weeks after intoxication. The distribution of muscle weakness of the delayed polyneuropathy is distinct from that seen in IMS. Cholinergic crisis and IMS present with life threatening complications. Ventilatory care is required in both situations; in view of the development of IMS it is necessary to observe all patients for at least 5 days after intoxication. There is growing concern regarding the effects of chronic exposure in man. The International Agency for Research in Cancer (IARC) concluded in 1983 that there was little evidence of strong mutagenic or carcinogenic effects in mammals from five widely used insecticides (malathion, methyl parathion, parathion, tetrachlorvinphos and trichlorfuron). However, controversy exists in interpretation of the studies on which the IARC conclusions were based. With the widespread use of these agents, effects of prolonged exposure on teratogenicity, carcinogenicity and reproductive function will be important areas of study. In view of the effect of OP agents on enzymes, drug sensitivities such as those observed with suxamethonium will become evident. Another group of drugs that may be affected similarly are the local anaesthetics, as the amino esters are usually hydrolysed in plasma by pseudocholinesterase. There is great emphasis on preventive measures and
on the use of alternatives to insecticides in agriculture. At present, the goal of safe and effective use of insecticides is achieved best by an agromedical approach to pesticide management - integrated, interdisciplinary application of the skills and knowledge of agriculture, applied chemistry and medicine.

Keifer, M., R. McConnell, et al. (1996). "Estimating underreported pesticide poisonings in Nicaragua." American Journal of Industrial Medicine 30 (2): 195-201. We undertook to estimate the degree of underreporting to a regional pesticide poisoning registry, and to estimate the true incidence of poisoning in an agricultural region of Nicaragua. We surveyed 633 workers at 25 of 33 agricultural cooperatives and any nearby private farms in a area geographically convenient to the regional health headquarters with a short structured interview about pesticide poisoning. Eighty-three percent of workers described current use of pesticides. Twenty-five percent described a pesticide poisoning in the preceding 12 months, and almost one-half (48%) described having been made ill by pesticides at some point in time. Sixty-nine (11%) described a poisoning in the preceding month, 23 of whom had received medical attention. The names of the medically treated were sought in the Regional Pesticide Poisoning Registry for the survey year of 1988. Only 8 of the 23 subjects were found reported to the registry when a total of 1,143 human pesticide poisonings were reported in the entire region. Using 65% as an estimate of underreporting to the registry, we calculate that 3,300 (95% CI 2100-7500) poisonings had received treatment in the region in 1988, of whom more than 2, 100 remained unreported. Based on the ratio of total poisonings (treated and untreated) to registry-reported poisonings among our survey respondents, we estimate that 6,700 (95% CI 4100-1800) systemic poisonings, occurred in 1988 in the region. Underreporting of pesticide poisonings disguises the enormity of the problem in developing countries. Even in a region with a strong emphasis on illness reporting for targeted conditions, underreporting is substantial. This method for estimating underreporting is easily applied and provides a rough estimate of registry underreporting and actual incidence for conditions identifiable by a community-applied questionnaire.

Konradsen, F. (2007). "Acute pesticide poisoning - A global public health problem." Danish Medical Bulletin 54 (1): 58-59. Acute pesticide poisoning has become a major public health problem worldwide, following the intensification of agriculture and the promotion of agro-chemicals in low and middle income countries, with more than 300,000 deaths each year. The easy availability of highly toxic pesticides in the homes of farming communities has made pesticides the preferred means of suicide with an extremely high case fatality. Similarly, the extensive use of pesticides exposes the community to both long-term and acute occupational health problems. A concerted effort is urgently needed to address the situation.


Hundreds of thousands of people are dying around the world each year from the effects of the use, or misuse, of pesticides. This paper reviews the different options to reduce availability of the most hazardous chemicals, focusing on issues in developing countries. Emphasis is placed on the fatal poisoning cases and hence the focus on self-harm cases. Overall, it is argued here that restricting access to the most hazardous pesticides would be of paramount importance to reduce the number of severe acute poisoning cases and case-fatalities and would provide greater opportunities for preventive programmes to act effectively. The aim should be to achieve an almost immediate phasing out of the WHO Classes I and II pesticides through national policies and enforcement. These short-term aims will have to be supported by medium- and long-term objectives focusing on the substitution of pesticides with safe and cost-effective alternatives, possibly guided by the establishment of a Minimum Pesticide List, and the development of future agricultural practices where pesticide usage is reduced to an absolute minimum. Underlying factors that make individuals at risk for self-harm include domestic problems, alcohol or drug addiction, emotional distress, depression, physical illness, social isolation or financial hardship. These should be addressed through preventive health programmes and community development efforts.


**BACKGROUND:** The pesticides monocrotophos, methamidophos, and endosulfan were a very common cause of severe poisoning in Sri Lanka during the 1980s and early 1990s, before they were banned in 1995 and 1998. Now, the most commonly used insecticides are the less toxic World Health Organization Class II organophosphorus pesticides and carbamates. These bans were followed by a large reduction in both fatal poisonings and suicide in Sri Lanka. **OBJECTIVE:** We aimed to see if these bans adversely affected agricultural production or costs. **METHODS:** We used data from the World Resources Institute to compare the yields of the main crop groups in Sri Lanka with those from surrounding South Asian countries for 1980-2005. We also examined data from the Sri Lankan Department of Census and Statistics to examine the yields of 13 specific vegetable crops and rice for 1990-2003, along with the costs of rice production. **RESULTS:** We found no drop in productivity in the years after the main bans were instituted (1995, 1998). We observed substantial annual fluctuation in estimated yields in all data sources, but these did not coincide with the bans and were no larger than the fluctuations in other countries. Also, there was no sudden change in costs of rice production coinciding with bans. **CONCLUSIONS:** Countries aiming to apply restrictions to reduce deaths from pesticide poisoning should evaluate agricultural needs and develop a plan that encourages substitution
of less toxic pesticides. If farmers have an affordable alternative for pest control for each crop, there is no obvious adverse effect on agricultural output.


Ingestion of pesticides is the most common suicide method worldwide, accounting for one third of all suicides, predominantly in Asia, Africa, Central and South America. Case fatalities are high, particularly in rural areas. This high case fatality may explain the similar numbers of male and female suicides in Asia, since more women die from their attempts. In Asia, pesticide suicides are mostly impulsive acts with little advance planning and they are less often associated with mental illness than in Western countries. Pesticides are generally chosen for their easy access. Prevention strategies include treating the problems leading to suicidal behaviors involving pesticides; changing attitudes, knowledge, and beliefs about pesticides; controlling access to dangerous pesticides, including developing secure storage practices (which are currently being evaluated); and improving the medical treatment of poisonings. More research is needed to better understand suicides involving pesticides in their cultural contexts and to evaluate the effectiveness of intervention programs, including assessment of possible substitution of methods. Also, more knowledge about protective factors may help suggest innovative prevention strategies.


Acute poisoning by organophosphorus (OP) compounds is a major global clinical problem, with thousands of deaths occurring every year. Most of these pesticide poisoning and subsequent deaths occur in developing countries following a deliberate self ingestion of the poison. Metacid (Methyl parathion) and Nuvan (Dichlorovos) are commonly ingested OP pesticides; Dimethoate, Profenofos, and Chlorpyrifos are other less frequently ingested compounds in Nepal. The toxicity of these OP pesticides is due to the irreversible inhibition of acetylcholinesterase (AChE) enzyme leading to accumulation of acetylcholine and subsequent over-activation of cholinergic receptors in various parts of the body. Acutely, these patients present with cholineric crisis, intermediate syndrome and delayed polynuropathy are other sequel of this form of poisoning. The diagnosis depends on the history of exposure to these pesticides, characteristic manifestations of toxicity and improvements of the signs and symptoms after administration of atropine. The supportive treatment of OP poisoning includes the same basic principles of management of any acutely poisoned patient i.e., rapid initial management
of airways, breathing, and circulation. Gastric lavage and activated charcoal are routinely used decontamination procedures, but their value has not been conclusively proven in this poisoning. Atropine is the mainstay of therapy, and can reverse the life threatening features of this acute poisoning. However, there are no clear cut guidelines on the dose and duration of atropine therapy in OP poisoning. Cholinesterase reactivators, by regenerating AChE, can reverse both the nicotinic and muscarinic effects; however, this benefit has not been translated well in clinical trials. All these facts highlight that there are many unanswered questions and controversies in the management of OP poisoning and there is an urgent need for research on this aspect of this common and deadly poisoning.


BACKGROUND: Suicide is and has been a major public health problem in Sri Lanka and has generated a wide range of literature. AIMS: This review aimed to systematically appraise what is known about suicide in Sri Lanka. The patterns and content of articles were examined and recommendations for further research proposed. METHOD: The paper describes the systematic search, retrieval, and quality assessment of studies. Thematic analysis techniques were applied to the full text of the articles to explore the range and extent of issues covered. RESULTS: Local authors generated a large body of evidence of the problem in early studies. The importance of the method of suicide, suicidal intention, and the high incidence of suicide were identified as key foci for publications. Neglected areas have been policy and health service research, gender analysis, and contextual issues. CONCLUSION: The literature reviewed has produced a broad understanding of the clinical factors, size of the problem, and social aspects. However, there remains limited evidence of prevention, risk factors, health services, and policy. A wide range of solutions have been proposed, but only regulation of pesticides and improved medical management proved to be effective to date.


Suicide is the third leading cause of death among young adults worldwide. There is a growing recognition that prevention strategies need to be tailored to the region-specific demographics of a country and to be implemented in a culturally-sensitive manner. This review explores the historical, epidemiological and demographic factors of suicide in India and examines the strategies aimed at the prevention of suicide. There has been an increase in the rates of suicide in India over the years, although trends of both increases and decline in suicide rates have been present. Distinct from global demographic risk factors, In India, marital status is not necessarily protective and the female: male ratio in the rate of suicide is higher. The motives and modes of suicide are also distinct from western countries. Preventive strategies implemented at a community level and identifying vulnerable individuals maybe more effective than global strategies.


BACKGROUND: The Palestinian Poison Control and Drug Information Center was established in 2006 to provide up-to-date information on medications and to help in the early diagnosis and management of poisoning cases. OBJECTIVES: To summarize the activities carried out by the PCDIC in the past 2 years. METHODS: Documented inquiries received at the PCDIC were analyzed and the Center's activities were extracted from the files. RESULTS: During the first 2 years of the Center's existence, 323 enquiries were received, mainly (67.2%) from physicians; 70% of the calls were from the city of Nablus. Unintentional poisoning was the leading type of call (62.8%) followed by suicidal poisoning (20.7%). Medications were the major category of toxicants encountered (48.9%), followed by pesticides (23.5%). In 67.9% of the cases, the calls were initiated before any treatment was provided. The advice provided by the PCDIC was based on the nature of the call. During these 2 years the PCDIC has conducted both academic and non-academic activities. The Center introduced the concept of poison prevention weeks in Palestine and has conducted two so far. The PCDIC has published several articles in the fields of toxicology, rational drug use, complementary and herbal therapy, pharmacoepidemiology, and self-medication. CONCLUSIONS: Documentation of all enquiries is mandatory for analysis, evaluation, comparative purposes and quality assurance. More information campaigns are needed to encourage people to use the services provided by the PCDIC.


BACKGROUND/AIMS: Paraquat (PQ) has been used in suicide attempts; an estimated 2,000 toxic ingestions occur annually, with 60-70% mortality. We sought to determine why PQ is such a common agent for suicide attempts in Korea. METHODS: We analyzed 250 cases (143 males, 107 females) of attempted suicide by PQ ingestion from January to December 2007. The procurement of the PQ was divided into two categories: purchased and preexisting. RESULTS: Men were more likely to have purchased PQ than women (66% vs. 22%, p=0.042). Additionally, men were more likely to be unmarried (n=34, 23.9% vs. n=10, 9.3%) or divorced or separated (n=16, 11.3% vs. n=5, 4.6%) than the women (p<0.001). The group who intentionally selected PQ (38.4%) consisted of 96 cases (54 males, 42 females) and the group who did not intentionally select PQ (61.6%) included 154 cases (89 males, 65 females). The incidence of PQ purchase was higher in the intentional selection PQ group (46.9% vs. 18.2%, p<0.01). CONCLUSIONS: Only 38% of patients who attempted suicide with PQ intentionally selected PQ. Thus, greater control of PQ availability is needed, especially in patients at risk.

Cases of acute pesticide poisoning (APP) account for significant morbidity and mortality worldwide. Developing countries are particularly susceptible due to poorer regulation, lack of surveillance systems, less enforcement, lack of training and inadequate access to information systems. Previous research has demonstrated wide variability in incidence rates for APP. This is possibly due to inconsistent reporting methodology and exclusion of occupational and non-intentional poisonings. The purpose of this document is to create a standard case definition to facilitate the identification and diagnosis of all causes of APP, especially at the field level, rural clinics and primary health-care systems. This document is a synthesis of existing literature and case definitions that have been previously proposed by other authors around the world. It provides a standardized case definition and classification scheme for APP into categories of probable, possible and unlikely/unknown cases. Its use is intended to be applicable worldwide to contribute to identification of the scope of existing problems and thus promote action for improved management and prevention. By enabling a field diagnosis for APP, this standardized case definition may facilitate immediate medical management of pesticide poisoning and aid in estimating its incidence.


Acute pesticide poisoning is a major public health problem in Sri Lanka. In several agricultural districts, it precedes all other causes of death in government hospitals. Most of the acute poisoning cases are intentional (suicide) and occur among young adults, mainly males. Poisoning due to occupational exposure is also common, but less well documented. In an irrigation area in Sri Lanka a very high incidence of serious pesticide poisoning was observed, with 68% due to intentional ingestion of liquid pesticides. It is argued that the easy availability and widespread use of highly hazardous pesticides is the most important reason for this high number of poisoning cases. The frequent application of highly hazardous pesticides in high concentrations was often irrational and posed serious health and financial risks to the farmers. Sales promotion activities and credit facilities promoted this excessive pesticide use, which was not counteracted by an agricultural extension service. Hazardous practices when spraying pesticides were due to the impossibility of applying recommended protective measures under the local conditions, rather than to lack of knowledge. Current emphasis on programs that promote the safe use of pesticides through education and training of farmers will be ineffective in Sri Lanka because knowledge is already high and most poisoning cases are intentional. Instead, enforcement of legislation to restrict availability of the most hazardous pesticides would result in an immediate health benefit. Improved agricultural extension services to promote alternative non-chemical methods of pest control is the most important strategy, in the long term, to prevent acute pesticide poisoning.

Introduction: Ingestion of pesticides is the most common method of suicide, particularly in China, Sri Lanka and India. Reported pesticide suicides in India numbered 22,000 in the year 2006. Method: Four villages in the state of Andhra Pradesh in India that had stopped using chemical pesticides in favour of non-pesticide management (NPM) were visited to assess any change in suicide incidence before and after discontinuation of chemical pesticides. Four similar villages in the same region that continued to use chemical pesticides were used as controls for comparison. Results: In the pesticide-free villages there were 14 suicides before introduction of NPM and only three suicides thereafter. The percentage of suicides not reported to authorities was 47%. Conclusion: Restriction of pesticide availability and accessibility by NPM has the potential to reduce pesticide suicides, in addition to psychosocial and health interventions. Copyright 2009 SAGE Publications.


As the largest continent in the World, Asia accounts for about 60% of World suicides. Preventing suicide by restricting access to suicide methods is one of the few evidence-based suicide prevention strategies. However, there has been a lack of systematic exploration of suicide methods in Asian countries. To amend this shortage, the current review examines the leading suicide methods in different Asian countries, their trend, their age- and sex-specific characteristics, and their implications for suicide prevention. In total, 42 articles with leading suicide methods data in 17 Asian countries/regions were retrieved. The epidemiologic characteristics and recent trends of common suicide methods reflect specific socio-cultural, economic, and religious situations in the region. Common suicide methods shift with the introduction of technologies and constructions, and have specific age- or sex-characteristics that may render the restriction of suicide methods not equally effective for all sex and age sub-groups. Charcoal burning, pesticide poisoning, native plant poisoning, self-immolation, and jumping are all prominent examples. In the information society, suicide prevention that focuses on suicide methods must monitor and control the innovation and spread of knowledge and practices of suicide "technologies". It may be more cost-effective to design safety into technologies as a way of suicide prevention while there is no rash of suicides yet by the new technologies. Further research on suicide methods is important for public health approaches to suicide prevention with sensitivity to socio-cultural, economic, and religious factors in different countries.