



**IASP Special Interest Group (SIG) on the Prevention of Intentional Pesticide Poisoning**

**Bibliography: Other Regions**

Aghanwa, H. S. (2000). "The characteristics of suicide attempters admitted to the main general hospital in Fiji Islands." *J Psychosom Res* **49**(6): 439-445.

OBJECTIVE: To study the characteristics of suicide attempters attending the main general hospital in Fiji Islands. METHOD: Consecutive suicide attempters were clinically evaluated, and their sociodemographic and clinical characteristics were compared with those of other patients seen in the psychiatric service between January 15, 1999 and January 14, 2000.

RESULTS: Thirty-nine suicide attempters were seen, representing 36.8% of all the cases referred to the psychiatric service. The prevalence of attempted suicide in the Greater Suva Area was 34.8 per 100,000. Majority (56.4%) were young (16-25 years), Indians (59%), female (61.5%), students (41%), never married (74.4%) and of Hindi faith (48.7%). The commonly used methods were ingestion of drugs and pesticides. The intention to die was present in 20 (51.3%) of the population. Social problems and/or psychiatric comorbidity were present in over 60% of cases. Suicide attempters were significantly younger, more of single persons ( $P < .0001$ ), and fewer were in employment ( $P < .001$ ) than nonsuicidal cases seen. The difference was not significant when the two groups were compared regarding gender, race or religion. CONCLUSIONS: Young people attempt suicide in disturbed psychosocial milieu, using available poisoning methods with strong desire to die. Apparently, high proportion of female Indians in this group reflects high rate of service utilization by them. Unemployment is an insignificant predisposing factor.

Bensaude, R. J., P. Choutet, et al. (1979). "Self poisoning with phosphate and phosphorothioate ester pesticides. [French]." *Revue de Medecine de Tours* **13** (7): 1065-1067.

The ingestion of organophosphates in attempted suicide causes a very severe intoxication due to the slowness of the elimination of the substances ingested, which always gives rise to respiratory complications due to bronchial hypersecretion, bronchospasm and respiratory paralyses. The 2 cases reported here illustrate the necessity of prolonged monitoring because of the major risk of retarded acute respiratory insufficiency; of course, this monitoring should be clinical, but the electromyographic controls constitute a new aid of prime importance for the indication and stopping of assisted respiration.

Bogle, R. G., P. Theron, et al. (2006). "Aluminium phosphide poisoning." *Emerg Med J* **23**(1): e3.

We describe a lethal poisoning in a healthy woman caused by deliberate ingestion of aluminium phosphide (AIP), a pesticide used to kill rodents and insects. Toxicity of AIP and review of cases reported to the National Poisons Information Service (London) 1997-2003 are discussed.

Bruyndonckx, R. B., A. I. Meulemans, et al. (2002). "Fatal intentional poisoning cases admitted to the University Hospitals of Leuven, Belgium from 1993 to 1996." *Eur J Emerg Med* **9**(3): 238-243.

Between January 1993 and July 1996, a total of 2827 intentional cases of poisoning were registered in the University Hospitals of Leuven, Belgium. Ten of these cases were fatal. This study was set up to evaluate the

substances involved, the circumstances, the features and the characteristics of the patients who died due to intentional poisoning. The male to female ratio of these fatal cases was 9 : 1. The median age was 43 years. Two groups of substances were revealed to be associated with fatal outcome. The first group consisted of chemicals (seven lethal cases): cholinesterase inhibitors ( =3), methanol ( =2) and paraquat ( =2). The second group consisted of benzodiazepines (three lethal cases). In the cases of poisoning with chemicals, death was directly related to product toxicity and the severity of the poisoning, whilst with benzodiazepines, which are considered to be relatively safe drugs even when taken in overdose, there was a clear relationship between a fatal outcome and a delay between ingestion and medical support. Product toxicity, complications and a delay in medical support may be considered as predictors for the effectiveness and efficacy of treatment and may influence which medical treatments need to be administered.

Caganova, B., S. Plackova, et al. (2010). "Acute pesticide poisonings in the years 1994-2008 reported to the Toxicological Information Centre in Bratislava." Clinical Toxicology Conference: 2010 International Congress of the European Association of Poisons Centres and Clinical Toxicologists Bordeaux France. Conference Start: 20100511 Conference End: 20100514. Conference Publication: (var.pagings). 48 (3): 302-303.

Objective: The National Toxicological Information Centre (NTIC) in Bratislava has frequently been consulted for advice on pesticide exposures. To obtain more information about pesticide poisonings in Slovakia, we performed a retrospective analysis of all telephone calls to our Centre. Methods: All telephone inquiries involving pesticide exposures were extracted from our databases for the period 1994-2008. The following data were analysed: age, sex, intent of exposure (accidental or suicidal), substances ingested and clinical severity. All intoxications were classified in accordance with the Poisoning Severity Score. Results: During the 15-year period 26,547 acute intoxications were reported to the Slovak NTIC, of which 3,156 (11.9%) involved pesticides. Pesticide exposures in males (60.8%) were more prevalent than those involving females (33.4%). Accidental poisonings were more common (82.5%) than suicidal poisonings (15.8%). Almost half of the cases (48.1%) were children. Most exposures were caused by insecticides (46.0%), but rodenticides (23.3%), fungicides (9.3%), herbicides (12.3%) and other pesticides were also involved. Referring to the insecticides, 39.4% were organophosphates, 36.9% pyrethroids and 8.2% carbamates. Symptoms occurred in 81.2% of patients. The majority of them developed only mild toxicity (63.8%), moderate symptoms occurred in 12.4% and severe symptoms in 4.2% of all poisonings. Twenty-four cases (0.8%) resulted in death. Conclusion: Pesticide poisonings are still associated with many fatalities, especially among patients with organophosphate exposures. More efforts, such as legislative control of the availability of pesticides and further innovation in therapeutic measures, are required to reduce the serious impact of pesticide poisonings.

Chen, Y. Y., N. S. Park, et al. (2009). "Suicide methods used by women in Korea, Sweden, Taiwan and the United States." Journal of the Formosan Medical Association **108 (6)**: 452-459.

Background/Purpose: Few studies have compared methods of suicide used by women in different countries. This study compared methods used by women in South Korea, Taiwan, Sweden and the United States. Methods: Age- and method-specific suicide rates for women in the four countries in 2002 were calculated and compared. Hanging, firearms and jumping from a height were classified as violent suicide methods. Poisoning suicides were further classified according to use of drugs, gases, pesticides and other agents. Results: Half of Taiwanese and American women used violent methods, while only one third of women in South Korea and Sweden used such methods. Poisoning was the most often used suicide method by women in all four countries. About 90% of American and Swedish women used drugs. In contrast, almost half of women from Korea and Taiwan used pesticides. Conclusion: Different countries contrast greatly in the agents used in suicide by poisoning but not in patterns of violent methods used. 2009 Elsevier & Formosan Medical Association.

Davanzo, F., P. Vignally, et al. (2009). "Suicide attempt by poisoning in Italy: A preliminary characterization." Clinical Toxicology Conference: 29th International Congress of the European Association of Poison Centres and Clinical Toxicologists Stockholm Sweden. Conference Start: 20090512 Conference End: 20090515. Conference Publication: (var.pagings). 47 (5): 477-478.

Objective: The availability of toxic chemicals and of selected pharmaceuticals tends to facilitate suicide acts by poisoning. Therefore, accurate information about chemicals used and mode of exposure are important in order to devise national strategies and programmes for suicide and suicide attempt prevention. In the present study a preliminary characterization of suicide attempts by poisoning in Italy is provided. Methods: The Poison Control Centre of Milan (PCCM) handles about 60% of all cases referred to the PCCs active in Italy. For each patient examined, the PCCM collects the following information: demographic characteristics; exposure characteristics; clinical effects; therapy; outcomes. The PCCM database was searched to identify all cases with intentional exposure due to suicide attempts occurring in Italy in 2005. Results: In the period under study, the PCCM handled 42,483 new cases of human exposure and about 19% of them (n = 6699) were classified as due to suicide attempts. Among these patients there was an over representation of females (70 vs. 30%). The median age was 35 years (range: 8-95). About 83% of cases were exposed to pharmaceuticals, 14% to non pharmaceuticals, and 8% to both pharmaceuticals and non pharmaceuticals in combination. The route of exposure was mainly ingestion (97%), inhalation (1%) and parenteral (1%). The categories of agents most frequently reported were: sedative/hypnotics antipsychotics (43%), antidepressants (23%), analgesics (13%), anticonvulsants (11%), cardiovascular drugs (7%), and alcohol (7%). The group exposed to agricultural pesticides (1% of cases) was the only one with a higher percentage of men (65 vs. 35%). More than one agent was reported for about 45% of cases. Most of these were exposed to sedative/hypnotics antipsychotics in combination with other drugs (30%), mainly antidepressants

(12%) and anticonvulsants (5%). Combined exposure to drugs and alcohol was reported in 6% of cases. Among these, about half were exposed to sedative/hypnotics/antipsychotics. Poisoning severity was low for 46% of cases, moderate for 48%, elevated for 6%. Death was reported in 5 cases. Conclusion: The observations reported here should be considered as a starting point for further analyses focused on specific chemicals and commercial products.

Fleischmann, A., J. M. Bertolote, et al. (2005). "Characteristics of attempted suicides seen in emergency-care settings of general hospitals in eight low- and middle-income countries." *Psychol Med* **35**(10): 1467-1474.

**BACKGROUND:** The objective was to describe patients presenting themselves at emergency-care settings following a suicide attempt in eight culturally different sites [Campinas (Brazil), Chennai (India), Colombo (Sri Lanka), Durban (South Africa), Hanoi (Viet Nam), Karaj (Iran), Tallinn (Estonia), and Yuncheng, (China)]. **METHOD:** Subjects seen for suicide attempts, as identified by the medical staff in the emergency units of 18 collaborating hospitals were asked to participate in a 45-minute structured interview administered by trained health personnel after the patient was medically stable. **RESULTS:** Self-poisoning was the main method of attempting suicide in all eight sites. Self-poisoning by pesticides played a particularly important role in Yuncheng (71.6% females, 61.5% males), in Colombo (43.2% males, 19.6% females), and in Chennai (33.8% males, 23.8% females). The suicide attempt resulted in danger to life in the majority of patients in Yuncheng and in Chennai (over 65%). In four of the eight sites less than one-third of subjects received any type of referral for follow-up evaluation or care. **CONCLUSIONS:** Action for the prevention of suicide attempts can be started immediately in the sites investigated by addressing the one most important method of attempted suicide, namely self-poisoning. Regulations for the access to drugs, medicaments, pesticides, and other toxic substances need to be improved and revised regulations must be implemented by integrating the efforts of different sectors, such as health, agriculture, education, and justice. The care of patients who attempt suicide needs to include routine psychiatric and psychosocial assessment and systematic referral to professional services after discharge.

Gunnell, D., M. Eddleston, et al. (2007). "The global distribution of fatal pesticide self-poisoning: systematic review." *BMC Public Health* **7**: 357.

**BACKGROUND:** Evidence is accumulating that pesticide self-poisoning is one of the most commonly used methods of suicide worldwide, but the magnitude of the problem and the global distribution of these deaths is unknown. **METHODS:** We have systematically reviewed the worldwide literature to estimate the number of pesticide suicides in each of the World Health Organisation's six regions and the global burden of fatal self-poisoning with pesticides. We used the following data sources: Medline, EMBASE and psycINFO (1990-2007), papers cited in publications retrieved, the worldwide web (using Google) and our personal collections of papers and books. Our aim was to identify papers enabling us to estimate the proportion of a country's suicides due to pesticide self-poisoning. **RESULTS:** We conservatively estimate that there are 258,234 (plausible range 233,997 to

325,907) deaths from pesticide self-poisoning worldwide each year, accounting for 30% (range 27% to 37%) of suicides globally. Official data from India probably underestimate the incidence of suicides; applying evidence-based corrections to India's official data, our estimate for world suicides using pesticides increases to 371,594 (range 347,357 to 439,267). The proportion of all suicides using pesticides varies from 4% in the European Region to over 50% in the Western Pacific Region but this proportion is not concordant with the volume of pesticides sold in each region; it is the pattern of pesticide use and the toxicity of the products, not the quantity used, that influences the likelihood they will be used in acts of fatal self-harm. CONCLUSION: Pesticide self-poisoning accounts for about one-third of the world's suicides. Epidemiological and toxicological data suggest that many of these deaths might be prevented if (a) the use of pesticides most toxic to humans was restricted, (b) pesticides could be safely stored in rural communities, and (c) the accessibility and quality of care for poisoning could be improved.

Hatzitolios, A. I., M. L. Sion, et al. (2001). "Parasuicidal poisoning treated in a Greek medical ward: epidemiology and clinical experience." *Hum Exp Toxicol* **20**(12): 611-617.

OBJECTIVE: To study the epidemiology of acute poisoning patients presenting to an acute medical service ward in a Greek hospital between January 1998 and December 2000. DESIGN: Prospective case series. RESULTS: A total of 273 patients with self-poisoning were included in the study. This represented 3.8% of the overall admissions to the unit. The mean age of patients was 33, the most frequent age group being that aged 20-30 years (36.2% of total) with a male-to-female ratio of 1:1.97. Sixty per cent of patients was admitted within 4 h. Those from urban areas comprised 76.2% and 23.8% from rural areas. The most frequently ingested agents were psychopharmaceuticals (37.4%) and analgesics/anti-rheumatics (32.6%). Pesticides (7.7% of total) were most frequently used by patients coming from rural areas (32.3% of patients from rural areas). Alcohol was included in the overdose in 8.4%. Of the patients, 16.2% had a previous history of overdose. In this case series, psychiatric assessment suggested that 52% of the patients had a formal psychotic diagnosis, 21% had personality disorder and 27% had taken an overdose in response to stress. The most frequently documented precipitating factors were family problems and disputes (37%). Unusually, the seasonal distribution in these patients suggested a peak in summer (37.5% of presentations) with lower numbers in spring (30.2%), autumn (17.7%) and winter (14.6%). Of the patients, 23.7% presented in July. A total of 73.5% of patients was conscious, 16.4% was somnolent, 4.5% was in precoma and 5.6% was in coma (GCS <8). Patients who received antidotal therapy comprised 17.9%. Evidence of hepatic dysfunction was observed in 8.9% of patients and renal dysfunction in 3.6%. Extracorporeal techniques for drug removal (hemodialysis and hemoperfusion) were used in 2.2% of patients. Intensive care therapy was required in 11.4% of patients. The mean overall hospitalization time was 3.3 days. The mortality rate was 2.9%. CONCLUSIONS: This study shows that the epidemiology of self-harm by overdose in Greece is significantly different in terms of the seasonal presentation from other parts of Europe. The agents

ingested and other features are similar to northern Europe. Psychiatric diagnoses are more common in our group than in those reported from northern Europe.

Hegerl, U., R. Mergl, et al. (2013). "Why has the continuous decline in German suicide rates stopped in 2007?" *PLoS One* **8**(8): e71589.

**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)  $\leq -4.33$ ), drowning (APC  $\leq -2.73$ ), hanging (APC  $\leq -2.69$ ) and suicides by firearms (APC  $\leq -1.46$ ) 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.

Kastanaki, A. E., C. F. Kraniotis, et al. (2010). "Suicide by pesticide poisoning: findings from the island of Crete, Greece." *Crisis* **31**(6): 328-334.

**BACKGROUND:** The role of pesticides in suicidal acts has not yet received adequate attention in Greece despite an evident rise of 39% in pesticide use over the period 1990-1992 to 2002-2004. **AIMS:** To investigate the epidemiology of pesticide suicide on the Greek island of Crete, a largely rural agricultural area, and by further exploring the victim profiles, as well as patterns and trends of pesticide ingestion, to suggest probable preventive measures. **METHODS:** Self-poisoning suicides between 1999 and 2007 were reviewed and information gathered was entered into a computerized database. **RESULTS:** The overall incidence of intentional pesticide poisoning was 1.7 per 100,000, representing the second most frequently used suicide method after hanging. The victim profile was composed of the following features: middle aged male, rural habitant, who carried out a suicidal act by consuming primarily methomyl or paraquat (WHO toxicity class Ib and class II, respectively). As to the place of death, the vast majority was found dead in

the place of intoxication. CONCLUSIONS: Pesticide self-poisoning accounts for a quarter of the suicides in Crete. More detailed research is required to identify aspects of these deaths amenable to prevention, but measures such as bans on the most toxic pesticides and changes in storage practice would appear to be sensible initial approaches.

Kervegant, M., L. Merigot, et al. (2013). "Paraquat poisonings in France during the European ban: experience of the Poison Control Center in Marseille." J Med Toxicol **9**(2): 144-147.

Paraquat, a widely used herbicide in the world, has caused severe and fatal poisonings. Because of its high toxicity, the European Union withdrew paraquat from its market in July 2007. The purpose of this report is to describe cases of paraquat poisoning recorded at the Poison Control Center in Marseille over the 9-year period starting and ending 4.5 years before and after the paraquat ban. Data analysis showed that the most severe exposures were linked to ingestion. The fatality rate of deliberate consumption was near 50 % (34 suicide attempts and 15 deaths). Our data showed a marginal decline in total number of poisonings observed after the paraquat ban (38 vs 33 after the ban) mostly due to a decrease in the number of unintentional exposure (21 vs 16 after the ban). However, there was no apparent change in the number suicidal attempts using paraquat. Regarding geographical distribution, data showed that most poisonings in mainland France were unintentional, while poisonings in overseas French territories were mostly voluntary. Despite the European ban and the preventive measures, paraquat continues to contribute to severe and life-threatening poisonings in Southeastern and overseas France.

Kingston, R. L., W. L. Chen, et al. (1999). "Chlorpyrifos: a ten-year US poison center exposure experience." Vet Hum Toxicol **41**(2): 87-92.

We performed a retrospective review of data based on poison center exposure inquiries related to chlorpyrifos (CP) and the corresponding poison center-determined medical outcomes reported to the Toxic Exposure Surveillance System (TESS) of the American Association of Poison Control Centers. Ten y (1985-1994) of TESS data were obtained. Medical outcomes representing all inquiries, accidental/unintentional inquiries, and intentional suicidal inquiries were tabulated. Published TESS data was also tabulated to allow comparison of CP exposure inquiries to all non-pharmaceutical and insecticides/pesticides exposure inquiries for like time periods. Frequency of antidote use, product sales data, CP-related fatality reports, and pertinent issues related to telephone derived surveillance data were also reviewed; 36, 183 CP exposure inquiries were identified. Of all CP exposure inquiries, 27, 473 (75.9%) were assessed as having no significant health consequences; 4,511 (12.5%) outcomes were judged unrelated and 2,980 (8.2%) were unable to be followed. Reported significant medical outcomes for the remaining exposure inquiries were moderate 1,092 (3.0%), major 119 (0.3%) and death 8 (0.02%). Considering only calls with outcomes judged causally related to CP, where a given level of effect could reasonably be determined, 95.8% (27,473/28,692) of these calls resulted in no significant health effects. Use of antidotes specific to organophosphates were infrequent [atropine, 1.0% (385) and 2-PAM, 0.5% (177) of all cases respectively]. Despite the



number of reported CP exposure inquiries, relatively few resulted in outcomes of consequence. TESS data suggested that the majority of patients undergoing medical evaluation and/or treatment after a suspected CP exposure do not require specific antidotes. TESS data serves as a useful first step in evaluating product safety. Assessment of product toxicity requires additional investigation of reported adverse effects and circumstances related to the incident.

Majori, S., G. Ricci, et al. (2012). "The impact of acute intoxications in a toxicological unit care in north east Italy." *J Prev Med Hyg* **53**(1): 8-13.

Retrospective study in a toxicological unit care (TUC) performed to know the epidemiology of acute intoxication (AI) in Verona (Italy) during years 2008-2009. All data regarding patients with a diagnosis of certain/suspected AI were collected and evaluated: some demographic information, the characteristics of the agent involved, the pattern of exposure, the triage at the admission to TUC and the outcome. 244 cases were analyzed: 45.9% males and 54.9% females, mean age respectively 45.1 and 43.9 years. The monthly distribution of admitted patients resulted fairly constant, except from a light rising prevalence in autumn, with a majority of yellow (45.9%) and green (43.4%) triage code. The pattern of exposure resulted: ingestion (82.7% of cases; age peaks: 18-34 and 35-51 years old; mostly due to food (as mushrooms), drinks, detergents, soap, pharmaceutical, drugs of abuse, caustics substances), contact (10.2% of cases; age peak 18-51) and inhalation (6.9% of cases). In 17.2% of cases the poisoning exposure was intentional. In 63.5% the patients were sent to their general practitioners (45.5% of the yellow and 81.1% of the green coded patients) and in 22.1% of cases they were admitted to clinical rooms (44.6% of the yellow coded patients). In most cases the triage code assigned to the studied patients resulted yellow and green. Considering that the seriousness of the symptoms can appear after several hours from the exposure to toxic substances, a quick and specific intervention to obtain the best therapeutical effectiveness is suitable, in order to save lives or to avoid irremediable health damages.

Seskar Stojancov, S., S. Milicevic Mistic, et al. (2012). "Epidemiology of acute poisoning in Nis, Serbia." *Clinical Toxicology Conference: 2012 International Congress of the European Association of Poisons Centres and Clinical Toxicologists, EAPCCT 2012 London United Kingdom. Conference Start: 20120525 Conference End: 20120601. Conference Publication: (var.pagings). 50 (4): 334.*

Objective: Enough attention has not been dedicated to prevention of acute poisoning, and the relatively rarer accidental and criminal poisoning. Since the clinical toxicologist is familiar with all aspects of acute poisoning, from circumstances of poisoning to outcome, s/he should also be competent to consider the possibilities for prevention of acute poisoning. Methods: The purpose of this paper is to analyze acute poisonings, clinically treated and to define valid elements for proposals for prevention. The following were analyzed: the manner and circumstances of poisoning, neuropsychiatric disorders (NPS), other reasons for risk of poisoning and suicide, recurrence of poisoning, family history of suicide or severe neuropsychiatric disease. Results: Last year 1192 poisoned patients were examined at the clinic. The

intoxications involved were: alcohol 386 (32%), pesticides 153 (13%), corrosives 184 (16%), heroin 112 (9%), drugs, 293 (25%) and others 64 (5%). Of the total intoxications, 723 (60%) were women and 469 men (40%). A high proportion of intoxications were in young people aged from 20 to 30 years and in patients over 60 years. The majority of cases involved intentional ingestion of poisons, and only 5% of the cases involved accidental poisoning. In 98% of acute poisonings, drugs or toxic substances were located close at hand or in the immediate surroundings of the home environment. Of patients poisoned by drugs, 81% have been poisoned by the drug which was normally used in therapy. In 95% of those poisoned with chemicals they were taken from the immediate vicinity of the home environment. Of 21% of neuropsychiatric patients, 70% were not adequately treated, nor regularly monitored. There were 10% with recurrent intoxications and 45% with a family history of suicide or NPS disease. Conclusion: There is no need to hold large quantities of drugs in the household pharmacy, and toxic chemical substances should be kept well secured. This is especially true for families where there are suicidal, NPS patients, or chronic alcoholics. Precautions should be taken where there are younger people, emotionally unstable, with adolescent crises or who have made verbal statements about suicide, and the elderly with handicapped vision or psycho-organic disabilities.

Simic, A., S. Milicevic Misi c, et al. (2011). "Fatal pesticides-related self-poisonings in the southeastern region of Serbia-Alarming increase in suicides calls for restrictions." Toxicology Letters **Conference: 47th Congress of the European Societies of Toxicology, EUROTOX 2011 Paris France. Conference Start: 20110828 Conference End: 20110831. Conference Publication: (var.pagings). 205: S234.**

Objectives: Pesticide self-poisoning is a major problem in developing countries, especially in rural areas, and an important reason is that hazardous pesticides are available without restrictions. Organophosphates (OPs) are the most commonly used pesticides for suicidal poisoning causing over 200,000 deaths in the world yearly. The authors present an alarming increase in fatal OP-related self-poisonings from 1996 to 2006 in the southeastern region of Serbia. Methods: Descriptive, retrospective epidemiological study. Results: National statistical data in Serbia show a 2.7% decrease in the total number of suicides from 1996 to 2006. In the same period, the number of fatal self-poisonings increased by 18%, from 108 to 128. Ni is the centre of the southeastern part of Serbia, which is a low-income region with a predominantly rural population. In the University Clinical Centre in Ni, the total number of cases of fatal self-poisonings increased from 11 in 1996 to 32 in 2006 (10% and 25% of the total numbers in Serbia in these two years). Of these cases, 5 were related to OPs in 1996, and 16 in 2006. Thus, the number of OP-related fatal self-poisonings has increased by 320% in the Ni region in the ten-year period, and currently accounts for 50% of all the suicidal poisonings in this region. Conclusion: Measures should be taken to restrict the availability of pesticides.

Vougiouklakis, T., V. A. Boumba, et al. (2005). "Trends in suicide mortality in the deprived region of Epirus (north-west Greece) during the period 1998-2002." Med Sci Law **45(1): 39-46.**

This study determines the risk factors associated with suicide rates and the investigation of time trends in the deprived region of Epirus, north-west Greece, which is considered to be one of the least developed prefectures of the EU. Data selected demonstrated: (1) a mean age-standardized suicide rate per year of 4.00/100,000 for males, 1.29/100,000 for females and 2.65/100,000 for the total population; (2) a significant rising trend of male suicides in the 35-44 and 65-74 age groups; (3) a low female suicide rate in < 35 years age group and a relatively stable rate in the other age groups; (4) a significantly higher suicide rate in men than in women from both urban and rural areas and in older men from rural areas; (5) higher rates of suicide among widowed men and unmarried women; (6) the use of predominantly violent suicide methods, especially self-shooting, hanging and drowning; (7) a significant peak in the total suicide rate in the spring and summer months and a decreased rate in September; and (8) three out of four of the suicide victims had consumed alcohol and/or other drugs before the act. Data reported here shows some remarkable trends compared to previous reports on suicide in Greece and other countries, probably due to cultural and life style characteristics of the study population.