PostScript

RESEARCH LETTERS

Demographic risk factors in pesticide related suicides in Sri Lanka

Suicide rates in Sri Lanka (40 per 100 000) greatly exceed those of the United Kingdom (7.4/100 000), United States (12/100 000), and Germany (15.8/100 000).[1 2] A leading method of committing suicide in Sri Lanka is ingestion of pesticides, which are readily available in rural farming households. Self poisoning kills more people in rural Sri Lanka than ischemic heart disease and tropical diseases combined.[3] Although acute pesticide poisoning occurs at alarmingly high rates in Sri Lanka, it is also a major problem throughout the developing world. The worldwide incidence is three million cases and 220 000 deaths each year.[4]

Suicide attempts tend to be fatal, especially in the rural areas where rescue facilities are seldom available.[4] Further reasons for high mortality rates include the toxic nature of the substances involved, lack of antidotes, distances between hospitals and patients, and overburdened medical staff.[4]

This study analyzed raw data on pesticide related deaths in search of demographic risk factors contributing to these suicides in Sri Lanka during 2002.

Methods

Data were extracted from the Department of Police in Colombo, Sri Lanka, which reports total suicide case numbers and causes.[5] Population health data were provided by the Ministry of Health in Sri Lanka, Population Division.[6] Age standardized rates were calculated by multiplying the total case number for a given age group by 100 000 population, using numbers of actual population figures as the denominator.

Results

Age standardized rates showed differences in pesticide related suicides by gender and age (fig 1). Among Sri Lankan males the rates peaked between 60–64 years and males demonstrated higher pesticide related suicide mortality risk than females (rate ratio = 1.20, 95% confidence interval 1.10 to 1.31).

Discussion

Pesticide related suicide is a major problem in Sri Lanka where it is the cause of many deaths, particularly among males 40–54 years and in the elderly. Prevention strategies should target this population.

It is well known that most victims poison themselves with pesticides and herbicides, which are easily available because they are widely used on plantations.[7] Few protective measures are taken against ingestion as local populations tend to have the misguided belief that herbicides, pesticides, and toxic seeds do not cause pain when ingested.[2 7] The public must be educated about the long and short term effects of pesticides on health, particularly in these high risk populations. Mass media campaigns informing the public of the dangerous after effects of pesticides and proper pesticide handling procedures and storage may help.

Restrictions on pesticide availability are necessary for further prevention of these suicides. Eddleston *et al* suggested a model minimum pesticide list for use in developing countries to prevent mortality related to pesticides.[8] To be effective on a global level, the World Health Organization and Food and Agriculture Organization of the United Nations need to intervene to motivate local governments to implement this list.[8] In addition, governments should use pricing policies and differential taxation policies such as higher taxes and prices for potentially harmful pesticides to control their easy availability.

Given the complexity of the mechanisms involved in pesticide related suicide, it is likely that no single prevention strategy will combat this critical problem. Rather, a comprehensive and integrated effort involving many domains—the individual, family, agrochemical industry, community, media, and health care system—is needed.

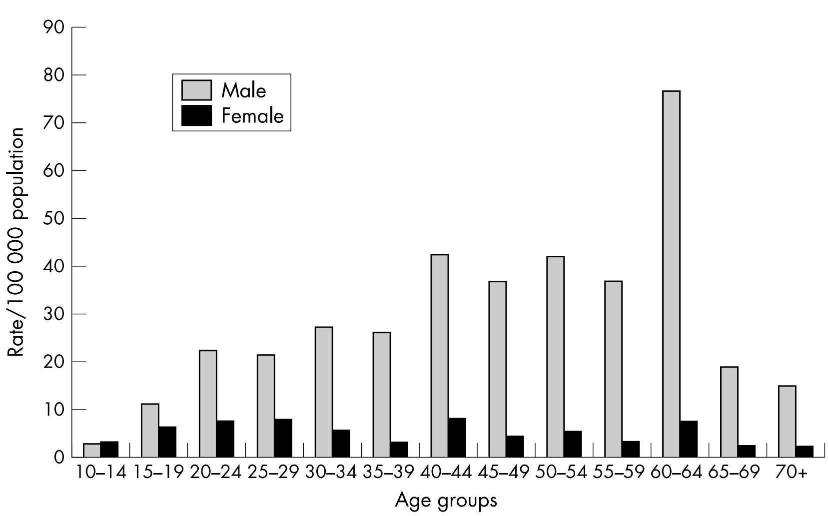

Figure 1 Age standardized rates for pesticide related suicides in Sri Lanka in 2002.

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Drowning deaths among Japanese children aged 1–4 years: different trends due to different risk reductions

Drowning, once by far the most important external cause of child deaths in Japan,[1] has reduced more rapidly than other injuries. Drowning mortality of children aged 1–4 years decreased from 45.4 per 100 000 in 1955, 4.5 times higher than that of traffic injuries, to 1.6 per 100 000 (ranking next to traffic injuries) in 2000. We could have achieved this by two main approaches: (1) environmental modification to reduce exposure to open water where most outdoor drownings occur[2] and (2) health education to reduce risk of bathtub drowning, which causes most of the domestic drownings.[2 3]

To know how these approaches contributed to the mortality reduction, we separately examined the trends of outdoor and domestic drowning mortality among children aged 1–4 years.

Data on drowning deaths were obtained from Vital Statistics compiled by the Ministry of Health, Welfare, and Labour. Drowning was classified as E code 910 in the eighth and ninth revision of the *International Classification of Diseases* (ICD-8 and 9) for the period 1967–94 and classified as code W65-74 in the 10th revision (ICD-10) for the period 1995–2001.

Population data, denominators of mortality rates, were from the national censuses for the years 1970, 1975, 1980, 1985, 1990, 1995, and 2000; and from the population estimations compiled by the Ministry of Public Management, Home Affairs, Posts and Telecommunications (MPHPT) for other years. Data on the proportion of houses equipped with a bathroom were from the Housing and Land survey by MPHPT. We analyzed the trends using Poisson regression.

Until the mid-1970s, domestic drowning mortality among children aged 1–4 years did not change whereas their outside mortality declined steadily (fig 1). Consequently, outdoor mortality, three times higher than domestic mortality in the late 1960s, became lower in the late 1980s. Annual change of domestic drowning mortality after 1975 was −5.6% (95% confidence interval (CI) −5.8 to −4.9%) and that of outdoor drowning mortality was −9.1% (95% CI −9.5 to −8.6%). The proportion of households with a bathroom, 65.6% in 1968, increased rapidly in the 1970s reaching 82.8% in 1978; it increased slowly thereafter reaching 95.4% in 1998.

A difference in risk reduction between outside and inside environments is a possible explanation of the different trends. Children's exposure to open water was reduced mainly through passive protections accompanying urbanization, such as fencing or covering rivers, ponds, lakes, and ditches.[2] Population shifts from rural to urban areas, and shift of children's play from outside to inside[4] might also have contributed to the exposure reduction.

In contrast, exposure control at home depends mostly on educational approaches that require vigilance or behavior change, such as continuous child supervision, emptying the bathtub, and locking the bathroom (children frequently drown when unattended in bathtub water reserved for laundry use.)[3 5] However, changes in customary behaviors are slow; short lapses of supervision are usual; and lock installation is uncommon.[5] Further, the rapid increase of domestic bathrooms, especially in the 1960s and 1970s, might have increased exposure as most bathrooms in Japan are equipped with a bathtub.

If improvement in medical or pre-hospital care contributed to the mortality reduction, it would not bring more benefit to outdoor drowning. Outdoor drowning involves longer rescue time and transportation to hospital. A hospital based study in Japan indicated higher case fatality of child drowning in ditches or ponds.[6]

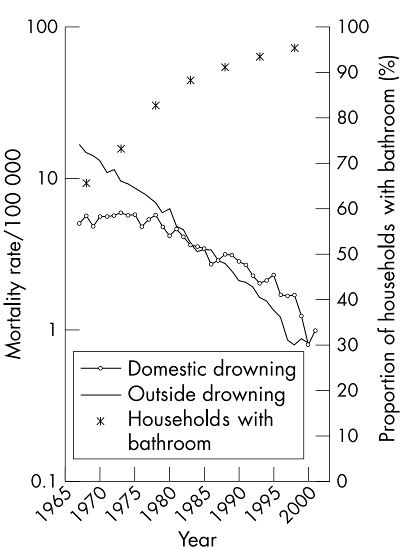

Figure 1 Drowning mortality rate (per 100 000 persons) of children aged 1–4 in Japan, 1967–2001; proportion of households with bathroom.

Although the mortality reduction at home was quite good, further reduction would be possible with other passive measures like lock installation on bathroom doors. This will decrease children's exposure to risk at home just as fencing does around domestic swimming pools.[7] However, legislative measures will be needed because one of the main reasons for not installing locks is living in rented property and the difficulty of getting permission for installation from the owner.[5]

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Reasons for trends in cyclist injury data

Cook and Sheikh discuss trends in percentages of hospital admissions involving head injury (%HI).[1] For pedestrians, %HI declined from 26.9% in 1995/96 to 22.8% in 2000/01 and for cyclists from 27.9% to 20.4%. Did increased helmet wearing (%HW, 16.0% in 1994, 17.6% in 1996 and 21.8% in 1999) cause the larger fall for cyclists?

Another explanation is that more cycle lanes and traffic calming measures (intended to lower the risk of collision with motorised traffic, and hence the proportion of total accidents involving motor vehicles (%MV)), reduced head injuries more than other injuries. Head injuries are 3–5 times more likely in motor vehicle crashes than bike only crashes.[2 3] Thus if %MV declines, as in New Zealand (fig 1),[4] so should %HI. In South Australia, %HI also declined progressively, as did %MV: 24.6%, 23.6%, 21.3%, 19.7%, and 18.3% over the years 1988 to 1992.[5]

The risk of head injury decreases with impact speed. When dummies on bikes were hit by imitation vehicles, lowering impact speed from 40 to 30 km/h reduced head injury criterion by 79%, maximum head acceleration by 50%, but maximum chest, pelvis, and knee accelerations by only 30%, 16%, and 21%.[6] Traffic calming aims to reduce impact speed, and therefore %HI.

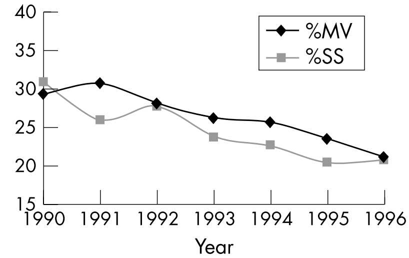

Figure 1 Percent of New Zealand cyclist admissions due to collisions with motor vehicles (%MV) and percent of all bike only collisions to secondary school age cyclists (%SS).

Cyclist injuries contain other trends. In New Zealand, the proportion involving secondary school age children fell from 31% in 1990 to 21% in 1996 (fig 1). Risk of head injury varies with age.[7] So %HI will vary with age composition of injured cyclists, within the age ranges (<16, ⩾16 years) considered.

Little can therefore be concluded from datasets with small gradual changes in %HW. The effect cannot be separated from other gradual changes, including overall rider experience, amount of off-road riding, campaigns for drivers to look out for cyclists, or those discussed above.

Differences in %HI of wearers and non-wearers in case-control studies can also be explained by other factors. The two groups often have different riding patterns and attitudes to risk, making it very difficult to correctly adjust for all relevant confounders.

However, when %HW changes dramatically but %HI does not, only one conclusion is possible—that helmets are largely ineffective. In New Zealand, %HI for primary schoolchildren and adults followed almost identical trends, even though adult %HW increased dramatically (43% to 92%) with the law, but not primary schoolchildren (fig 2). Head injury and helmet wearing data have been compiled for New Zealand (fig 2), South Australia,[5] Western Australia,[8] Victoria,[7] Queensland, and New South Wales.[9] In every case, helmet laws produced enormous changes in %HW, but little noticeable effect on %HI, just relatively smooth, gradual trends as in fig 2.

The claim that helmets prevent 60% of serious head injuries is simply not plausible if all data (case-control studies, trends in cyclist injuries, and effects of helmet laws) are considered together.

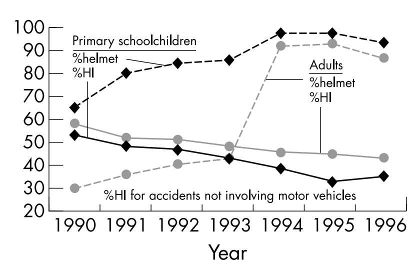

Figure 2 Percentages of New Zealand cyclists (adults and primary schoolchildren) wearing helmets (%helmet) and with head injury (%HI, from Robinson 2001).

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LETTER

International Classification of External Causes of Injury

Leff *et al* report on the results of a telephone survey in Colorado that used the NOMESCO classification to code activity at time of injury, place the injury occurred, and the events that caused the injury.[1] We would like to point out that a new classification known as the International Classification of External Causes of Injury (ICECI) was recently adopted as a related classification into the family of classifications by the World Health Organization (WHO) in October 2003 at the annual meeting of the WHO Center Heads for Classification in Cologne. By way of background, in the 1980s and early 1990s efforts including NOMESCO were identified to improve upon the *International Classification of Diseases* classification of external causes of injury for the purposes of injury prevention. Under the auspices of the WHO, injury professionals from all over the world have worked to develop ICECI, an improved tool for capturing injury data. Version 1.1a is the most recent. Complete documentation on the ICECI can be found at www.iceci.org.[2]

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CORRECTION

Safety in numbers: more walkers and bicyclists, safer walking and bicycling

In the above paper published in September (*Inj Prev* 2003;**9**:205–9) the author inadvertently listed an incorrect exponent for growth in injuries for bicycling in 14 European countries, in table 1, calculated results. The correct exponent is 0.40 (not 0.58 as provided). The 95% confidence interval of 0.38 to 0.42 is correct as published.