

Suicide in Sri Lanka

ABSTRACT

Background: About 400,000 Sri Lankans each year experience a serious mental problem. [2] Suicide has become a major concern in the country and with 100,000 people trying to commit suicide each year, Sri Lanka is home to one of the highest suicide rates in the world. [5]

Aims: The study aims to highlight the burden of suicide in Sri Lanka, looking at particular into trends, population, method of suicide, risk factors, causes and interventions.

Methods: The Ovid MEDLINE® In-Process & Other Non-Indexed Citations and Ovid MEDLINE®(1948-) database was searched and WHO publications were used.

Results & Discussion: The search returned 123 results, 24 of which were deemed relevant as well as 3 WHO reports. Sri Lanka's suicide rate rose 8-fold between 1960-1995, before then halving by 2005, which was due to pesticide bans. [8] The highest proportion of suicides were found in young males (25-29yrs) and females (15-24yrs). [12] The majority of suicides were carried out by self-poisoning, mainly due to pesticides [11]. Alcohol abuse, pre-existing psychiatric illness and a family history of suicide are key risk factors for suicide. [12,15,21] The greatest cause for suicide were relationship/marital or familial problems, highlighting the importance of the family in Sri Lankan culture. [21] Regulations on the sales of pesticides have had the greatest effect on suicide rate, however, other interventions such as safe storage, repackaging into non-lethal doses and integrated pesticide management are growing in popularity.

Conclusion: The suicide rate in Sri Lanka, although, very high, has been reduced since its peak in the 1990s. [8] Decentralisation of mental health services, development of outreach clinics and training of community health workers must continue to address this matter. [29] We must continue to understand the role of the family in those who commit suicide and provide effective mental support to high-risk groups in order to reduce this rate furthermore.

BACKGROUND

Sri Lanka, formerly known as Ceylon, is located to the south of the Indian subcontinent. This small, predominantly fishing and agricultural, island has been home to great conflict, with two decades of civil war coming to an end in May 2009. This affected much of the northern and eastern parts of the country, widening the gap in infrastructure and socioeconomic development even further between the urban and rural areas. At the end of 2004, much of the southern and western coast of the country was destroyed by the tsunami.

Sri Lankans enjoy an above-global average life expectancy at birth (figure 1). [1] The country has achieved the United Nations (UN) Millennium Development Goals (MDGs), however, there are great variations between regions, especially between areas of vast socioeconomic difference. [2] Healthcare is free, however, this is increasingly difficult to support as the country faces a double burden of disease; Sri Lanka is facing an increasing incidence of non-communicable diseases (NCDs) whilst still having to address its infectious disease burden as it advances in development. [3] According to the World Bank, "NCDs have already become the largest contributor to disease burden in Sri Lanka, accounting for 85% of ill health, disability and early death" despite the government only allocating 4% of its GDP towards this. [4]

Mental health is generally neglected in Sri Lanka. This is a global issue too, as mental disorders account for 4 of the 10 leading causes of disability, worldwide. [2] The turmoil of drought in 2002, the tsunami in 2004 and civil war over the last 20 years will have undoubtedly had great effects on the mental health of thousands of people. Close to

400,000 individuals per year express a serious mental complaint, with as many as 25% being diagnosed with depression in certain areas. [2]

Behind this country's high life expectancy and relatively successful healthcare system, hides a dark secret. Sri Lanka has one of the highest suicide rates in the world as nearly 100,000 people will attempt to take their lives every year; accounting for close to 6000 deaths/year. [5] Self-poisoning kills more people in rural areas of Sri Lanka than ischaemic heart disease and tropical diseases put together. [6] Suicide is now one of the top five causes for death in the world, amongst young adults. [7]

Selected indicators (2009)					
		Country	Regional average	Global average	
General	Total population (thousands)		20 238	...	
	Population living in urban areas (%)		15	33	
	Gross national income per capita (PPP int. \$)		4 720	3 330	
Mortality and burden of disease	Life expectancy at birth (years)	Male	65	64	
		Female	76	67	
		Both sexes	71	65	
	Adult mortality rate (per 1000 adults 15-59 years)		Both sexes	182	209
	Under-5 mortality rate (per 1000 live births)		Both sexes	16	59
	Maternal mortality ratio* (per 100 000 live births)			39	240
	Prevalence of HIV** (per 1000 adults 15-49 years)			1	3
	Prevalence of tuberculosis (per 100 000 population)			101	278

Figure 1: Indicators of Health in Sri Lanka in 2009¹

AIMS

This study aims to further investigate suicide in Sri Lanka and look into the burden of disease it imposes onto the people. Research will be conducted into historical & current trends, at-risk population, methods, risk factors as well as causes of suicide. The study will finish by looking at interventions used, before concluding all the information and suggesting ideas for further thought.

METHODS

The Ovid MEDLINE® In-Process & Other Non-Indexed Citations and Ovid MEDLINE®(1948-) database was accessed, using OVIDSP. Here, under the Medical Subject Headings, “suicide” was combined with an exploded search for “Sri Lanka”. After returning results, each abstract was read to view their relevance to the aims of the study, and were selected if deemed appropriate. If citations made were of relevance to this study, they would be also selected for further reading. In addition to this, WHO publications on Sri Lanka, NCDs and suicide from 2005- were also included.

RESULTS AND DISCUSSION

The search outlined above returned 123 results. 24 results were identified as relevant on top of the 2 relevant WHO reports.

Historical & Current Trends

Data collected from Sri Lanka’s Registrar General shows suicide rates in Sri Lanka from 1940-2005 (figure 2). [8] Sri Lanka shows a relatively stable suicide rate from 1940-1960. This rate then rises hugely from about 8 to 47 suicides per 100,000 in 1995; a massive 8-fold increase in only 35 years. It is the start of this rise that is associated with the first report of pesticide-related death in Sri Lanka in 1962. [9,10] Between 1995 and 2005, rates astonishingly, halved to about 23 suicides per 100,000. It was thought that the ban on the remaining class I methamidophos and monocrotophos pesticides in 1995 and the class II pesticide endosulfan in 1998 led to this rapid decrease in suicide rates. [8] However, it was found that even though the suicide rate dropped after 1995, there was a 16% increase in those using pesticides between 2003-2005 compared to 1993-1995. [8] This shows that there even though there has been a decline in suicide rates, nationally, there appears to be an increase in the use of pesticide poisoning as a means for suicide.

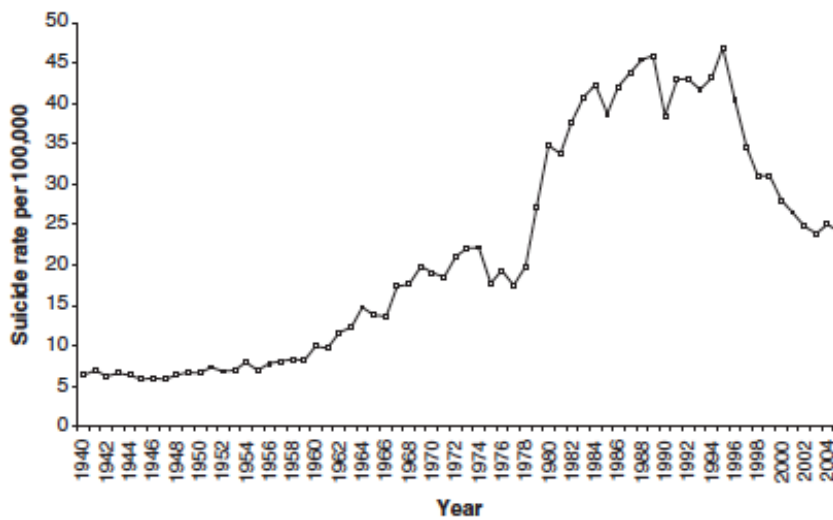


Figure 2: Suicide in Sri Lanka 1940-2005⁸

Population

Understanding the people that are at risk of suicide is key to reducing the high suicide rate. Figure 3 illustrates the age groups of suicide victims during 2006 in Colombo. [11] Figure 4 shows the age and sex distribution of suicides in 3 districts during 3 months in 1997. [12] Both studies show the highest proportion of suicides in the younger age group, 20-29/15-24. Looking at gender, 79% of the suicides in figure 4 were male. Combining gender and age, it is seen that over half of the female suicides were between

15-24 years. In males, there is a much wider distribution of suicides amongst age, with the largest proportion lying in the 25-34 year age group.

It has been shown that the majority of suicide victims have been young, married men who have not been able to cope with family/relationship problems. [11] Having said this, young females (15-24 years) should not be ignored, as they are a very high-risk group within the female population. There has also been an increase in elderly Sri Lankans committing suicide. Older Sri Lankans were found to ingest more oleander seeds (poisonous seeds that slow the heart), such that the risk of death increased with age. [13] An explanation put forward, suggests that the elderly are more intent on dying, as they have to cope with chronic illness and social isolation. [13]

Age group (years)	No.	%
0-19	20	13.2
20-29	47	31.1
30-39	25	16.6
40-49	34	22.5
50-59	14	9.3
60-69	6	4.0
70-79	3	2.0
80-89	1	0.7
>90	1	0.7
Total	151	

Figure 3: Age group of suicide victims¹¹

Age group	No. of male suicides (% total) ^a	No. of female suicides (% total)	Total suicides (% total)
10-14 years	5 (1.7)	4 (5.1)	9 (2.4)
15-24 years	56 (19.2)	41 (51.9)	97 (26.1)
25-34 years	63 (21.6)	12 (15.2)	75 (20.2)
35-44 years	56 (19.2)	7 (8.9)	63 (17.0)
45-54 years	42 (14.4)	5 (6.3)	47 (12.7)
55-64 years	39 (13.4)	5 (6.3)	44 (11.9)
65 years and over	31 (10.6)	5 (6.3)	36 (9.7)
All ages	292 (100)	79 (100)	371 (100)

Figure 4: Age & sex distribution of suicides¹²

Methods of Suicide

Figure 5 shows the method of suicide in Colombo during 2006. [11] The leading method, consistent with many studies, is poisoning. Nationwide, poisoning accounted for 60% of deaths with 90% of these due to pesticide self-poisoning. [14] Of the 66 who died from poisoning in figure 5, 70% of these were due to pesticides, mainly paraquat [11]. This relates to Sri Lanka's hugely agricultural background and easy access to pesticides. Of more than 60 different pesticides used by farmers, it is endosulfan (insecticide) and paraquat (herbicide) that has caused almost half of the deaths. [15] In a different study, conducted in Polonnaruwa, 45% of suicides were found to have ingested insecticides, the most popular being organophosphorus compounds and carbamates, and 36% were found to have ingested herbicides; mainly glyphosate and propanil. [16] Looking into what affected people's choice of poison, a surprising 85% stated that easy availability was the reason for their choice of suicide. [17]

Self-immolation or burning was the second leading method of suicide, with simple access to kerosene being a major contributor to this. [11] Globally, and in concordance to Sri Lanka, young women make up the majority of this group. [18] Hanging was the 3rd leading method of suicide, a technique that was the leading cause of suicide until 1961, when self-poisoning took over. [19] In 2006, an emerging epidemic of laundry detergent poisoning was brought to light; the number of cases has doubled in 2 years and regulation in sales will be needed to tackle this new problem. [20]

Method of suicide	No.	%
Poisoning	66	43.7
Self-immolation	51	33.8
Hanging/suffocation	17	11.3
Jumping in front of a train	10	6.6
Drowning in a river/lake/well	4	2.7
Firearms/gunshots	2	1.3
Explosives	1	0.7
Total	151	

Figure 5: Method of suicide¹¹

Risk Factors

van de Hoek & Konradsen, in 2005, showed that socioeconomic status and type of occupation were not risk factors in committing suicide, however, poor education and being unemployed were. [15]

Alcohol has been a very complex component of suicide in Sri Lanka. Alcohol consumption per head has quadrupled in just over 20 years from 1.81l/capita in 1981 to 7.37l/capita in 2003. [8] Alcohol dependency is either on *kasippu* (illegal home-made brew, drunk by two-thirds of abusers), or *arrack* (a spirit derived from coconut, sold in liquor stores). [12,15] Alcohol abuse of the father of the household is a common problem and leads to a breakdown of the family, due to lower productivity, reduced income, and increased debt. The father, unable to provide for his family and ashamed of himself, often then resorts to suicide. As much as 50% of men who self-harmed were under the influence at the time. [21]

Reports of depression in those who take their lives vary considerably from about a third to almost a fifth. [12,15] The major problem with the diagnosis of depression is poor understanding of the condition amongst healthcare workers in Sri Lanka, thus leading to varying reported rates in different regions. A history of self-harm puts patients in a high-risk group for suicide. [22] Having said this only 8.7% of suicides admitted to Polonnaruwa General and Peradeniya had self-harmed before. High first-time case fatality, poor mental health follow-up and longer lengths of hospital stay (as the risk of suicide is greatest immediately after a major self-harm episode and being in care reduces this chance), are thought to be behind this. [23] A family history of suicide was found in almost 17% of those who committed it, reflecting the high incidence of suicide, nationwide. [12]

Causes

As much as 46% committed suicide in Colombo, 2006 due to problems with their marriage/relationship, family or parents, which highlights the huge importance the family has in Sri Lankan culture (figure 6). [11] Female suicides were triggered by dwindling romance, illegitimate pregnancy and perceived loss of virginity whereas male suicides were due to infidelity of spouse followed by poverty, unrequited love and illness. [21]

Physical, sexual or psychological abuse in the household attributed to 12% of suicide cases, where more than often, self-harm was used by the victim as punishment towards the perpetrator. [21] 8% were found to have committed suicide due to life-threatening disease, mental disorder or permanent disability, as they found themselves inadequate in the upbringing of the family. [21] In adolescents, education expectations of families, bullying and exam stress resulted in 7% of suicides. [21] There remains very high competition to enter the best schools and universities that the country has to offer and this can put undue stress on the younger population. In a random selection of 2 schools, as many as 36% were screened positive for depression. [24] A small proportion of <5% of suicides were due to financial struggles. [21]

Impulsivity has been an interesting personality trait in those who committed suicide. The fact that only 9% had left suicide notes implies that the majority of suicides were done under impulse. [11] This is further augmented by the easy accessibility of pesticides; in 90%, these were in their house, fields close by or in neighbour's homes. [21]

Reason for suicide	No.	%
No clear reason	29	19.2
Dispute with husband	20	13.3
Dispute with wife	16	10.6
Dispute with parents	12	8.0
Financial matters	11	7.3
Organic disease	11	7.3
Alcohol dependence	10	6.6
Marital unhappiness	9	6.0
Psychiatric illness	9	6.0
Disputes in love affair	8	5.3
Unemployment	4	2.7
Grief reaction	4	2.7
Dispute with brother/sister	2	1.3
Problems at work	3	2.0
Dispute with children	3	2.0
Total	151	

Figure 6: Reason given at the inquest for committing suicide¹¹

Interventions

Figure 7 shows the effectiveness of bans on pesticides in Sri Lanka. [8] As we can see from the graph, banning WHO class I pesticides led to a significant decrease in the suicide rate. However, endosulfan, a class II organochlorine insecticide became the most common pesticide used in suicides. Once endosulfan was banned in 1998, deaths from suicide fell from 27 in 1998 to 3 in 2001 in Anuradhapura. [25] Even though agronomists argue that bans decrease agricultural output, there is no good evidence to support this claim. [26] Integrated Pest Management which involves the use of natural predators against pests instead of using pesticides has been in operation over the last 10 years, however, this is still in its early days so the effects of this alone are yet to be seen. [27] Training of vendors to become more selective of who they sell pesticides to has proven effective in reducing suicide rates, regionally. [21] Studies looking at storage of pesticides have shown interesting results; even though it is still primitive, it has been found that after seven months of using a lockable box for pesticide storage, 66% kept the pesticides safe from adults and children. [28] Whilst this proportion may seem low, regulations could be passed to ensure all those that bought pesticides kept them in a locked container. Figure 8 summarises many interventions that are being considered and their level of preference as selected by an academic panel in Sri Lanka. [27]

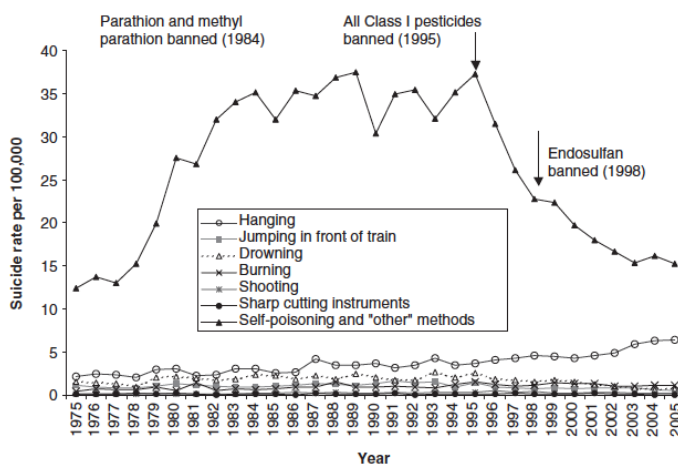


Figure 7: Method specific suicide rates: Sri Lanka 1975-2005⁸

Restriction in access through bans	1
Repackaging of pesticides into non lethal doses	2
Reduce use of pesticides through promotion of IPM	3
Regulation of advertising/marketing	4
Safe storage of pesticides at community level	5
Reduce use through promotion of bio-pesticides	=6
Training pesticide retailers	=6
Alter price through taxation or other methods	8

Figure 8: Final ranking of options²⁵

CONCLUSION

Suicide has been highlighted as an important issue in Sri Lanka. Whilst bans on pesticides have been an effective measure against self-poisoning, suicide remains a much more difficult task to tackle. There is only limited literature available on the situations faced by those that take their lives. It is by understanding the psychosocial role that these people have within the wider context of the family that will help address this issue better. Mental health services need to expand beyond the large psychiatric hospitals of Colombo; there is only one psychiatrist for every half a million people, and these are rarely found in rural settings. [5] Since 2006, more effort has been put into decentralising central services, establishing outreach clinics and training community support workers, but increased effort is required for this to be successful. [29] In defining high-risk individuals, and providing them access to appropriate mental support, we can hope to reduce the suicide rate further.

1. World Health Organisation. (2009) *Country Health Profile*. [Online]. Available from: <http://www.who.int/countries/lka/en/> [Accessed 1st Dec 2011]
2. World Health Organisation. (2009) *Country Cooperation Strategy*. [Online] Available from: http://www.who.int/countryfocus/cooperation_strategy/ccs_lka_en.pdf [Accessed 1st Dec 2011]
3. Gunawardene, N. (1999) Sri Lanka's double burden kills rich and poor alike. *Health Millions*, 25 (4), 27
4. The World Bank. (2011) *Tackling Non-Communicable Diseases in Sri Lanka*. [Online]. Available from: <http://www.worldbank.lk/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/SRILANKAEXTN/0,contentMDK:22839556~menuPK:232812~pagePK:2865066~piPK:2865079~theSitePK:233047,00.html#dual> [Accessed 1st Dec 2011]
5. Siva, N. (2010) Sri Lanka struggles with mental health burden. *Lancet*, 375 (9718), 880-881
6. De Silva, H., Kasturiratchi N., Seneviratne S., Senaratne, C., Molagoda, A., Ellawala, N. (2000) Suicide in Sri Lanka: points to ponder. *Ceylon Medical Journal*, 45 (1), 17-24
7. Bertolote J., Fleischmann A., De Leo D., Bolhari J., Botega N., De Silva D., Tran Thi Thanh H., Phillips M., Schlebusch L., Varnik A., Vijayakumar L., Wasserman D. (2005) Suicide attempts, plans, and ideation in culturally diverse sites: the WHO SUPRE-MISS community survey. *Psychological Medicine*, 35 (10), 1457-65
8. Gunnell D., Fernando R., Hewagama M., Priyangika WD., Konradsen F., Eddleston M. (2007) The impact of pesticide regulations on suicide in Sri Lanka. *International Journal of Epidemiology*, 36 (6), 1235-42
9. Jayewardene, C., Saravanabavanathan N. (1966) Insecticide Poisoning. *Ceylon Medical Journal*, 11 (4), 143-52
10. Vethanayagam, A. (1962) Folidol Poisoning. *Ceylon Medical Journal*, 7 (1), 209-11
11. Fernando, R., Hewagama, M., Priyangika, W., Range, S., Karuratne, S. (2010) Study of suicides reported to the Coroner in Colombo, Sri Lanka. *Medicine, Science & the Law*, 50 (1), 25-8
12. Abeyasinghe, R., Gunnell, D. (2008) Psychological autopsy study of suicide in three rural and semi-rural districts of Sri Lanka. *Social Psychiatry & Psychiatric Epidemiology*, 43 (4), 380-5
13. Eddleston M., Dissanayake M., Sheriff M., Warrell D., Gunnell D. (2006) Physical vulnerability and fatal self-harm in the elderly. *British Journal of Psychiatry*, 189 (1), 278-79
14. Manuel, C., Gunnell, D., van der Hoek, W., Dawson, A., Wijeratne, I., Konradsen, F. (2008) Self-poisoning in rural Sri Lanka: small variations in incidence. *BMC Public Health*, 8 (1), 26
15. van der Hoek, W., Konradsen, F. (2005) Risk factors for acute poisoning in Sri Lanka. *Tropical Medicine & International Health*, 10 (6), 589-96

16. Mohamed F., Manuweera G., Gunnell D., Azher S., Eddleston M., Dawson A., Konradsen F. (2009) Pattern of pesticide storage before pesticide self-poisoning in rural Sri Lanka. *BMC Public Health*, 9 (1), 405
17. Eddleston, M., Karunaratne, A., Weerakoon, M., Kumarasinghe, S., Rajapakshe, M., Sheriff, M., Buckley, N., Gunnell, D. (2006) Choice of poison for intentional self-poisoning in rural Sri Lanka. *Clinical Toxicology*, 44 (3), 283-6
18. Laloë, V. (2004) Patterns of deliberate self-burning in various parts of the world. A review. *Burns*, 30 (3), 207-15
19. Dissanayake, S. (1974) Suicide and attempted suicide in Sri Lanka. *Ceylon Medical Journal*, 23 (1), 10-27
20. Gawarammana, I., Ariyananda P., Palangasinghe C., De Silva N., Fernando K., Vidanapathirana M., Kurupparachchi M., Munasinghe M., Dawson A. (2009) Emerging epidemic of fatal human self-poisoning with a washing powder in Southern Sri Lanka: a prospective observational study. *Clinical Toxicology*, 47 (5), 407-11
21. Konradsen, F., Hoek, W., Peiris, P. (2006) Reaching for the bottle of pesticide – A cry for help. Self-inflicted poisonings in Sri Lanka. *Social Science & Medicine*, 62 (7) 1710-9
22. Taylor, S., Kingdom, D., Jenkins, R. (1997) How are nations trying to prevent suicide? An analysis of national suicide prevention strategies. *Acta Psychiatrica Scandinavica*, 95 (6), 457-63
23. Mohamed F., Perera A., Wijayaweera K., Kularatne K., Jayamanne S., Eddleston M., Dawson A., Konradsen F., Gunnell D. (2011) The prevalence of previous self-harm amongst self-poisoning patients in Sri Lanka. *Social Psychiatry & Psychiatric Epidemiology*, 46 (6), 517-20
24. Rodrigo, C., Welgama, S., Gurusinghe, J., Wijeratne, T., Jayananda, G., Rajapakse, S. (2010) Symptoms of anxiety and depression in adolescent students; a perspective from Sri Lanka. *Child & Adolescent Psychiatry & Mental Health*, 4 (1), 10
25. Eddleston, M., Manuweera, G., Roberts, D. (2003) Pesticide regulations in Sri Lanka. *Lancet*, 361 (9369), 1657-8
26. Manuweera, G., Eddleston, M., Egodage, S., Buckley, N. (2008) Do targeted bans of insecticides to prevent deaths from self-poisoning result in reduced agricultural output? *Environmental Health Perspectives*, 116 (4), 492-5
27. Pearson, M., Anthony, Z., Buckley, N. (2010) Prospective policy analysis: how an epistemic community informed policymaking on intentional self poisoning in Sri Lanka. *Health Research Policy & Systems*, 8 (10), 19
28. Konradsen, F., Peiris, R., Weerasinghe, M., van der Hoek, W., Eddleston, M., Dawson, A. (2007) Community uptake of safe storage boxes to reduce self-poisoning from pesticides in rural Sri Lanka. *BMC Public Health*, 7 (1), 13
29. World Health Organisation. (nd) *Mental Health Factsheet*. [Online] Available from: http://www.whosrilanka.org/LinkFiles/WHO_Sri_Lanka_Home_Page_Mental_Health_Factsheet.pdf [Accessed 2nd Dec]