

1

2

3

4

## **Repetition of deliberate self-poisoning in rural Sri Lanka**

5

6 PHGJ Pushpakumara<sup>1\*</sup>, SUB Thennakoon<sup>2</sup>, TN Rajapakse<sup>3</sup>, Ranil Abeysinghe<sup>3</sup>, AH Dawson<sup>4</sup>

7 <sup>1</sup>Department of Family Medicine, Faculty of Medicine and Allied Sciences, Rajarata University of Sri

8 Lanka, Saliyapura, Sri Lanka.

9 <sup>2</sup>Department of Community Medicine, Faculty of Medicine, University of Peradeniya, Peradeniya, Sri

10 Lanka.

11 <sup>3</sup>Department of Psychiatry, Faculty of Medicine, University of Peradeniya, Peradeniya, Sri Lanka.

12 <sup>4</sup>Central Clinical School, University of Sydney, Sydney, Australia.

13

14 \* Corresponding author

15 E-mail: janakatechno@gmail.com

## 1 **Abstract**

2 Repetition of deliberate self harm is an important predictor of subsequent suicide. Repetition rates in  
3 Asian countries appear to be significantly lower than in western high income countries. The reason for  
4 these reported differences is not clear and has been suggested to due methodological differences or  
5 the impact of access to more lethal means of self harm. This prospective study determines the rates  
6 and demographic pattern of deliberate self-poisoning, suicide and fatal and non fatal repeated  
7 deliberate self-poisoning in rural Sri Lanka.

8 Details of deliberate self poisoning admission in all hospitals (n=46) and suicides reported to all the  
9 police stations (n=28) of a rural district were collected for 3 years, 2011-2013. Demographic details of  
10 the cohort of deliberate self-poisoning patients admitted to all hospitals in 2011 (N=4022), were  
11 screened to link with patient records and police reports of successive two years with high sensitivity  
12 using a computer program and manual matching was performed with higher specificity. Life time  
13 repetition was assessed in a randomly selected subset of DSP patients (n=438).

14 There were 15,914 DSP admissions and 1078 suicides during the study period. Within the study area  
15 the deliberate self poisoning and suicide population incidences were, 248.3/100,000 and  
16 20.7/100,000 in 2012. Repetition rate for four weeks, one-year and two-years were 1.9% (95% CI 1.5-  
17 2.3%), 5.7% (95% CI 5.0 to 6.4) and 7.9% (95% CI 7.1 to 8.8) respectively. The median interval between  
18 two attempts were 92 (IQR 10 - 238) and 191 (IQR 29 - 419.5) days for the one and two-year repetition  
19 groups. The majority of patients used the same poison in the repeat attempt. Age and hospital stay of  
20 individuals with repetitive events were not significantly different from those who had no repetitive  
21 events. The two-year rate for suicide following DSP was 0.7% (95% CI 0.4-0.9%). Reported life time  
22 history of deliberate self harm attempts was 9.5% (95% CI 6.7-12.2%).

23 The low comparative repetition rates in rural Sri Lanka was not explained by higher rates of suicide or  
24 access to more lethal means or differences in methodology.

25

## 26 **Introduction**

27 Deliberate self harm (DSH) is a major global public health problem. The World Health Organization  
28 (WHO) projects the worldwide yearly suicide mortality rate will increase to 1.53 million and it will be  
29 constitute 2.4 % of the total disease burden by 2020. (1). While there is significant variation of suicide  
30 rates between countries Sri Lanka's suicide rates have remained amongst the highest in the world, (2,  
31 3).

32 A recent meta-analysis estimated that one in 25 patients presenting to hospital for self-harm will  
33 suicide in the next 5 years. (4). Understanding factors that influence the rate and pattern of repetition  
34 of self harm has the potential to inform prevention strategies and optimal follow-up after a self-harm  
35 episode. There appears to be geographic differences in the 1 year non-fatal repetition rates. In  
36 European studies 1 year non-fatal repetition rates was estimated as 17.1% (95% CI 15.9-18.4) while it  
37 was lower in Asia (10.0%, 95% CI 7.3-13.6). (4). Possible proffered reasons for this included  
38 methodological weakness of the Asian studies, higher lethality of self-poisoning and longer hospital  
39 stay(4). It was suggested that identifying the reasons for this variation could provide insights into  
40 optimal configuration of health care services (4).

41 This prospective study determines the four weeks, one year and two year rates of fatal and non-fatal  
42 repeated self harm and estimates life-time repetition rate and pattern in deliberate self poisoning in  
43 the Kurunegala District (KD), of Sri Lanka, which was conducted as a part of comprehensive analysis of  
44 DSH and suicide in KD (5).

45

## 46 **Methods**

### 47 **Study Setting and Design**

48 This study was conducted in the predominately rural agricultural KD in Sri Lanka. The district has a  
49 population of 1.6 million(6) who have free access to 46 government hospitals; 45 District Hospitals  
50 and the tertiary Teaching Hospital Kurunegala (THK)(7). Both in-hospital and community deaths from  
51 suicides from any causes are reported to district police stations (n=28)

52 A prospective cohort of all hospital presentations following deliberate self-poisoning (DSP) to  
53 government hospitals within the KD was established between 1<sup>st</sup> January 2011 to 31<sup>st</sup> December, 2013  
54 as part of a study of use of treatment guidelines (Sri Lanka Clinical Trial Registry No. SLCTR/2010/ 008).

55 This study on self-harm repetition utilized this cohort for hospital data and in addition collected data  
56 on all suicides reported to district police stations, to identify fatal repetitions. A randomly selected  
57 subset of patients and their bystanders were interviewed to determine self-reported lifetime  
58 repetition rate and pattern.

### 59 **Study Recruitment Prospective Repetition Cohort**

60 Identification, demographic and clinical details of all DSP admissions were collected for the study. In  
61 THK all patients were enrolled into the cohort at the time of admission, by fulltime study doctors  
62 employed as clinical research assistants. Patients were seen at least daily until discharge or death. At  
63 the other 45 district hospitals data was extracted from patient medical record by tertiary postgraduate  
64 research assistants and entered into a study data base along with a scanned copy of the medical record  
65 of the patient's admission to facilitate audit. Hospitals were visited every 2-4 weeks depending upon  
66 the size of the hospital. Typically, all relevant admission records had been left aside at each hospital  
67 to facilitate case finding but in each hospital the admission ledgers were also reviewed to ensure all  
68 relevant medical records had been identified.

69 Details of all suicides reported to police stations were collected by visiting all 28 police stations in the  
70 district. Data was retrieved from suicide registers at each police station, by tertiary educated  
71 postgraduate research assistants, for the same period.

72 Within the cohort, the patients index admission was their first admission to any study hospital  
73 between 1<sup>st</sup> January 2011 to 31<sup>st</sup> December, 2011. Following the index admission, the study database  
74 was interrogated for repeat presentations for a period of two years to hospitals or police stations. As  
75 there is no unique patient medical record number within the provincial health system, identification  
76 of inter-hospital transfers and repeat presentations required individual identity linkage.

77 Initial linkage utilized surname, at least one of the other names, sex and age as mandatory fields and  
78 residential address as an optional field, for confirmation of the matching. A five step method, which  
79 has been adapted from a English-Sinhala transliteration system (8) and a process of matching names  
80 in Sinhala (9), was used in screening to generate possible spelling combinations of surname, other  
81 names and village/address; transliteration into Sinhala, decomposing Sinhala words, single and multi  
82 character replacements, generation of possible spelling combinations of Sinhala words by combining  
83 replaced characters and transliteration into English. Semi-automated stepwise data matching and  
84 filtering process was followed for record linking. Records were screened for links with high sensitivity  
85 using the computer, then subsequent manual confirmation of any screened results

#### 86 **Study Recruitment Lifetime Recalled Repetition Cohort**

87 Lifetime recalled previous self-harm was conducted in a randomly selected cohort of patients  
88 admitted to THK following DSP. Patients were randomly selected using a computer program from  
89 blocks of 7 consecutively admitted consenting DSP patients within a consecutive eighteen months  
90 from 1<sup>st</sup> July 2011. Immediately prior to discharge patients received a structured interview by medical  
91 graduates research assistants who were trained for the data collection. Patients were asked to recall

92 previous episodes of self-harm (e.g. poisoning, hanging, and drowning). Interview information was  
93 verified through a close relative or someone well aware about the patient.

#### 94 **Data analysis**

95 Data were entered onto a Microsoft Access database and analyzed using SPSS version 23.

#### 96 **Ethics statement**

97 Ethics approval was obtained from Ethics Review Committee, Faculty of Medicine, University of  
98 Peradeniya for 'A clustered RCT of educational interventions on treatment of patients with acute  
99 poisoning in rural Asian hospitals'. Ethical approval for additional data collection was obtained from  
100 the Ethics Review Committee, Faculty of Medicine and Allied Sciences, Rajarata University of Sri Lanka.  
101 The study was conducted with the support of the Provincial Department of Health Care and nutrition,  
102 of the North Western Province and Department of Police, Sri Lanka.

## 103 **Results**

### 104 **Prospective Cohort Study**

105 A total of 15,914 and 1,078 records were collected from hospitals and police stations respectively, for  
106 the 3 years. THK received 53% of all DSP cases of the district either as direct admission or following  
107 transfer. Follow-up cohort consisted of 4,022(50.8% males and 49.2% females) patients after  
108 removing double counting due to inter hospital transfers, with a median age of 23 years. The highest  
109 proportion of the cohort, 35.5% (95% CI 34.7 to 36.2), presented following ingestion of agro-  
110 chemicals. This was followed by overdose of medications, 32.9% (95% CI 32.1 to 33.6), and ingestion  
111 of oleander seeds, 15.2% (95% CI 14.6 to 15.7). In 2012 the DSP incidence in KD was 248.3/100,000  
112 (95% CI 240.6 to 255.9) and male:female ratio was 1.1 (Table 1).

113

	Age adjusted DSP Incidence in 2012 per 100,000 Population* (95% CI)			Male:Female Ratio
	Male	Female	Total	
10-14	80.7 (58.3 to 103.1)	188.9 (154.3 to 223.4)	134.3 (113.8 to 154.8)	0.4
15 - 19	634.4 (570.9 to 697.8)	1304.0 (1213.6 to 1394.3)	971.4 (916.1 to 1026.7)	0.5
20 - 24	769.6 (694.3 to 844.9)	760.2 (688.0 to 832.4)	764.7 (712.6 to 816.9)	1.0
25 - 29	414.4 (360.7 to 468.1)	371.3 (323.6 to 418.9)	391.5 (355.8 to 427.2)	1.1
30 - 34	317.2 (272.6 to 361.7)	231.5 (195.2 to 267.9)	272.4 (243.9 to 300.9)	1.4
35 - 39	292.2 (247.3 to 337.0)	144.0 (113.4 to 174.6)	216.0 (189.1 to 242.9)	2.0
40 - 44	243.3 (201.8 to 284.8)	88.8 (64.4 to 113.1)	163.8 (140.1 to 187.6)	2.7
45 - 49	231.2 (189.9 to 272.6)	56.7 (37.1 to 76.4)	140.4 (118.0 to 162.7)	4.1
50 - 54	175.4 (138.7 to 212.0)	54.2 (34.8 to 73.6)	111.8 (91.6 to 132.0)	3.2
55 - 59	146.2 (110.6 to 181.7)	23.5 (10.2 to 36.8)	80.6 (62.6 to 98.6)	6.2
60 - 64	118.0 (83.1 to 152.9)	36.2 (18.4 to 53.9)	73.6 (55.0 to 92.2)	3.3
65 - 69	125.6 (78.2 to 172.9)	36.3 (13.8 to 58.8)	75.5 (51.1 to 99.8)	3.5
70 - 74	128.6 (70.8 to 186.4)	15.3 (-2.0 to 32.7)	64.0 (37.3 to 90.8)	8.4
75 - 79	120.4 (49.3 to 191.6)	14.2 (-5.5 to 34.0)	56.1 (25.6 to 86.6)	8.5
80 & over	188.8 (99.0 to 278.6)	37.1 (4.6 to 69.6)	97.8 (56.9 to 138.7)	5.1
Overall	257.7 (246.4 to 269.0)	239.5 (229.1 to 249.9)	248.3 (240.6 to 255.9)	1.1

114 \*DSP incidences were calculated based on the 2012 DSP events

115 Table 1: Age standardized DSP incidences in 2012 in Kurnegala District among males and females, with  
116 male to female ratio.

117

118 A total of 77 (n=44, 57% were males) had a repeat self-harm event within the first four weeks from  
119 the indexed event. Repetition rate for the four week period was 1.9% (95% CI 1.5-2.3%). The median  
120 age of those who repeated within the first four weeks was 27 years (IQR 19 – 44 years).

121 There were 179 (56.3%) males and 139 (43.7%) females with repetition of self-harm within two years.  
122 One-sample binominal test showed that repetitive events were significantly common among males  
123 (p=0.03) and being a male carried a 1.3 fold excess risk for repetitive attempts (OR 1.3, 95% CI 1 to  
124 1.6).A majority, 290 (91.2%), had only one repetitive attempt, 24 (7.5%) had two, 3 (0.9%) had three  
125 and one (0.3%) had four during that period. One year and two year repetition rates were 5.7% (95%  
126 CI 5.0 to 6.4) and 7.9% (95% CI 7.1 to 8.8) respectively. The median age of males who repeated self-  
127 harm within the two year follow-up period was 28 years (IQR 20 – 40 years) and for females it was 19  
128 years (IQR 16 – 25 years). For more than one fifth (22.3%) of males and nearly half (48.9%) of the  
129 females repetition occurred in the 15-19 year age group, which is an over representation compared  
130 to the cohort, male 22% and female 37%. Mann Whitney test analysis showed that compared to the  
131 ages of males, females were younger,  $p < 0.0001$ . One sample chi-square test showed that  
132 probabilities of having a repetitive event among age categories were significantly different,  $p < 0.0001$ .  
133 Relatively higher repetition rates were reported among younger age groups in females and opposite  
134 pattern in males (Table 2, Figs 1 and 2). T-test analysis showed that the ages of individuals who had  
135 repetitive events and who had no repetitive events, do not differ significantly,  $p = 0.33$ .

136

137 Fig 1 shows the four weeks, one year and two year repetition rate of males by age group and sex.

138

139 Fig 2 shows the four weeks, one year and two year repetition rate of females by age group and sex.

140



141 The average intervals between two consecutive events were 246.8 days (SD 223.4) among males and  
142 238.5 days (SD 207.0) among females, and this difference was not significant,  $p=0.7$ . One-sample  
143 Kolmogorov-smirnov test showed that intervals between index event and the first repetitive event  
144 were not normally distributed,  $p < 0.0001$ . Fig 3 shows the cumulative probability of the first repetitive  
145 DSP events in first two years by sex. Median times to repetition within 1 year and 2 years were, 92  
146 (IQR 10 - 238) and 191 (IQR 29 - 419.5) days. The highest risk for repetition was observed in the initial  
147 one week period, where 17% ( $n=54$ ) repetitive attempts occurred. 9.1% ( $n=29$ ) had re-attempted on  
148 the following day of the indexed event.

149

150 Fig 3 shows the cumulative probability of the first repetitive DSP events during their first two years,  
151 by sex.

152

153 The first repetitive event was a fatal for 28 (8.8%) individuals. None of the second, third or fourth  
154 repetitive events were fatal. The two year rate for suicide following DSH was 0.7% (95% CI 0.4-0.9%).  
155 All fatal repetitive events were reported among males. The mean age for those who carried out fatal  
156 repetitive events was 49.7 (SD 15.3) and those who died were significantly older compared to those  
157 who had non-fatal outcome,  $p < 0.0001$ . Nearly 40% of fatal two year repetitive events occurred within  
158 the first week and 50% within first 3 weeks following the indexed event.

159 The pattern of type of poison used for the repetitive events was similar to the pattern of the cohort.  
160 60% of individuals who ingested agro-chemicals used the same method for the next consecutive  
161 event. Nearly half (47%) and more than half (55%) of individuals who overdosed medicines and  
162 ingested oleander seeds used the same method for the next consecutive event. A majority, 24  
163 (85.7%), of fatal repetitions were due to poisoning; two due to oleander and 22 agro-chemicals. One  
164 (3.6%) was due to hanging and 3 (10.7%) were not classified. More than three fourth (77%) of

165 individuals who ingested agro-chemicals at the fatal repetitive event used the same method at the  
 166 index event. Table:3 summarizes the findings.

Type of poison ingested	Individuals in Cohort	Individuals with Repetitive events			
		Use at the indexed Event	Same Method used in any two consecutive events	Used for the fatal events	Same Method used in the fatal and Indexed event
		% (95% CI)	n (%)	n (%)	n (%)
Agro-Chemical	35.5 (34.7 to 36.2)	127 (39.9)	76 (48.7)	22 (91.7)	17 (94.4)
Medicine	32.9 (32.1 to 33.6)	93 (29.2)	44 (28.2)	0(0)	0(0)
Oleander	15.2 (14.6 to 15.7)	60 (18.9)	33 (21.1)	2 (8.3)	1 (5.6)
Hydrocarbon	4.6 ( 4.3 to 4.9)	10 (3.1)	2 (1.3)	0 (0)	0 (0)
Alkali	0.1 ( 0.1 to 0.2)	1 (0.3)	0 (0)	0 (0)	0 (0)
Rodenticide	0.8 (0.7 to 1.0)	3 (0.9)	0 (0)	0 (0)	0 (0)
Fertilizers	0.6 (0.5 to 0.7)	1 (0.3)	0 (0)	0 (0)	0 (0)
Acid	0.2 (0.1 to 0.3)	0(0)	0 (0)	0 (0)	0 (0)
Other Chemical	0.9 (0.7 to 1.0)	3 (0.9)	0 (0)	0 (0)	0 (0)
Oleander & Medicine	0.1 (0.1 to 0.2)	1 (0.3)	0 (0)	0 (0)	0 (0)
Medicine & Agro-Che.	0.3 (0.2 to 0.4)	0 (0)	0 (0)	0 (0)	0 (0)
Combined Agro-Che.	0.07 (0.03 to 0.11)	0 (0)	0 (0)	0 (0)	0 (0)
Other Combination	0.5 (0.4 to 0.6)	0 (0)	0 (0)	0 (0)	0 (0)
Unknown	8.2 (7.8 to 8.6)	19 (6)	0 (0)	0 (0)	0 (0)
Total	100	318 (100)	155 (100)	24 (100)	18(100)

167 Table 3: Fatal and non-fatal repetitive events by the type of the poison and pattern of use at the  
 168 subsequent events.

169 The median hospital stay of DSP patients managed at peripheral hospitals, for both who had and did  
 170 not have repetitive attempts, were two days (Table 4). The duration of the hospital stay did not differ  
 171 significantly depending on the type the poison. Further, it did not show a significant association with  
 172 the occurrence of repetition of self-harm. It showed that 4.1% (95% CI: 3.2 – 5.2%) and 2.9 % (95% CI:  
 173 2.1-3.7%) of patients admitted to peripheral hospitals and THK were discharged at the same day.  
 174 23.6% (95% CI: 21.6 – 25.7%) and 17.2% (95% CI: 15.5 – 19.0%) of patients were discharged the  
 175 following day respectively.

176

Type of poison	Cases	Deaths	Case fatality ratio	Median Hospital stay (IQR) in days			
				Peripheral		THK	
				Non-repetitive	Repetitive	Non-repetitive	Repetitive
Agro-Chemical	5092	136	2.67%	2 (2-4)	3 (2-4.5)	2 (2-3)	2 (2-3)
Medicine	5014	8	0.16%	2 (1-3)	2 (1.75-3)	2 (1-2)	2 (1-2)
Oleander	2814	32	1.13%	2 (2-3)	3 (2-4)	2 (2-3)	3 (2-4)
Hydrocarbon	623	3	0.48%	2 (1-2)	2 (1.25-2.75)	2 (1-2)	2 (1-2)
Acid /Alkali	35	1	2.86%	1 (1-2)	-	2 (2-3)	-
Rodenticide	92	0	0%	2 (1-3)	-	2 (2-2)	2 (2-2)
Fertilizers	66	0	0%	2 (1-3)	3 (3-3)	2 (2-2)	-
Other/Combinations	139	0	0%	2 (1-2)	2 (1-2)	2 (2-3)	2 (2-2)
Unknown	2039	18	0.88%	2 (1-2)	1 (1-2)	2 (1-3)	3.5 (2.25-6.25)
Total	15914	198	1.24%	2 (1-3)	2 (2-3)	2 (2-3)	2 (2-3)

177 Table 4: Duration of hospital stay and case-fatality ratio by type of poison

178

179 There were 1,078 suicides in the district by all methods in 2011 to 2013 (Table 5). It showed that only  
 180 31.2% of male and 33.3% of female suicides by poisoning reported to hospitals. Suicide incidence in  
 181 KD was 20.7/100,000 (95% CI 18.5 to 22.9) and the male:female ratio was 4.4 (Table 6).

Methods	Male		Female		Total	
	N	%	N	%	N	%
Burning	5	0.6	7	3.9	12	1.1
Stabbing/Cutting with a sharp weapon	2	0.2	1	0.6	3	0.3
Drowning	24	2.7	18	10.1	42	3.9
Gun shot	2	0.2	0	0.0	2	0.2
Hanging	269	29.9	30	16.9	299	27.7
Jump to motor vehicle	1	0.1	0	0.0	1	0.1
Jump to Train	43	4.8	7	3.9	50	4.6
Oleander	35	3.9	27	15.2	62	5.8
Pesticide	499	55.4	84	47.2	583	54.1
Pesticide & Drowning	1	0.1	0	0.0	1	0.1
Other	11	1.2	4	2.2	15	1.4
Not Recorded	8	0.9	0	0.0	8	0.7
Total	900	100.0	178	100.0	1078	100.0

182 Table 5: Suicides in KD by method and sex

183

	Age adjusted Suicide Incidence per 100,000 population* (95% CI)			Male:Female Ratio
	Male	Female	Total	
10-14	0.0	4.9 (-0.6 to 10.5)	2.4 (-0.3 to 5.2)	-
15 - 19	13.2 (4.1 to 22.4)	14.7 (5.1 to 24.2)	13.9 (7.3 to 20.6)	0.9
20 - 24	40.3(23.1 to 57.5)	19.6 (8.0 to 31.2)	29.6 (19.3 to 39.8)	2.1
25 - 29	25.3 (12.1 to 38.6)	1.6 (-1.5 to 4.7)	12.7 (6.3 to 19.1)	15.9
30 - 34	26.0 (13.3 to 38.8)	17.8 (7.7 to 27.9)	21.7 (13.7 to 29.8)	1.5
35 - 39	25.1 (11.9 to 38.2)	6.8 (0.1 to 13.4)	15.7 (8.4 to 22.9)	3.7
40 - 44	47.9 (29.5 to 66.3)	5.2 (-0.7 to 11.1)	26.0 (16.5 to 35.4)	9.2
45 - 49	67.4 (45.1 to 89.8)	8.9 (1.1 to 16.6)	36.9 (25.5 to 48.4)	7.6
50 - 54	77.7 (53.3 to 102.1)	3.6 (-1.4 to 8.6)	38.9 (27.0 to 50.7)	21.5
55 - 59	45.0 (25.3 to 64.7)	0.0	20.9 (11.8 to 30.1)	-
60 - 64	75.1 (47.3 to 102.9)	11.3 (1.4 to 21.2)	40.5 (26.7 to 54.3)	6.6
65 - 69	74.4 (37.9 to 110.9)	10.9 (-1.4 to 23.2)	38.8 (21.3 to 56.2)	6.8
70 - 74	108.3 (55.2 to 161.3)	25.5 (3.1 to 47.9)	61.1 (34.9 to 87.3)	4.2
75 - 79	76.6 (19.9 to 133.4)	7.1 (-6.8 to 21.1)	34.5 (10.6 to 58.4)	10.8
80 & over	77.7 (20.1 to 135.3)	0.0	31.1 (8.1 to 54.2)	-
Total	34.6 (30.5 to 38.7)	7.8 (5.9 to 9.7)	20.7 (18.5 to 22.9)	4.4

184 \*Suicide incidences were calculated based on the suicides occurring in 2012

185 Table 6: Age standardized suicide incidences in KD in 2012 among males and females

186

187 **Lifetime Recalled Repetition Study**

188 Life time previous DSH was recorded in 433 (male 47% and female 53%) randomly selected cases.

189 Forty one (9.5%) had life time history of DSH attempts; 20 (48.8%) males and 21 (51.2%) females. The

190 average age of cases who had made previous attempts was 26.9 years (SD 13.1, 95% CI 22.8 - 31.1).

191 Of amongst the cases who had made previous attempts, a majority (32, 78%) had made only one

192 previous attempt. Eight (19.5%) had two previous attempts and one (2.3%) had four.

193

194

195

## 196 Discussion

197 The population based DSP incidence reported in our study area of 248.3/100,000 is considerably lower  
198 than that observed by Knipe et. al. (10). This difference is most likely due to double counting of DSP  
199 due to high rates of inter-hospital transfer(11)that artificially in inflates the incidence. When transfers  
200 were included and double counted DSP incidence increases to 347.4/100,000 (95% CI 338.3 – 356.4)  
201 in KD. In contrast to suicide incidence, DSP incidence among males was slightly higher than females,  
202 and the male to female ratio was 1.1:1 which, is exact opposite of the sex ratio of the district's  
203 population (12). This finding is compatible with the previous findings, that sixteen out of seventeen  
204 studies reported higher male to female gender ratio for DSH (13). The pattern observed for age  
205 standardized DSP incidents is different to the pattern of suicide. One third of DSP occurred in 15-24  
206 years age group, more than half less than 34 years. That follows national pattern (14) as well as pattern  
207 in South East Asian region (15, 16). This age, gender pattern can be partially explained by main six  
208 culture specific factors; (1) adolescents are often faced with stressful academic and familial  
209 expectations despite limited resources and opportunities (17) (2) socio-cultural concept related to the  
210 response towards suicidal behaviour based on sympathetic grounds (18), (3) it is a response to  
211 stressful events, which carries a powerful message to a specific person or to the society, or simply a  
212 way to conveying misgiving, anger, sadness, hopelessness, frustration, especially among  
213 adolescents(19), (4) a learned way of manipulating a situation to their own advantage, or  
214 communicating distress(19), (5) the blend of socio-economic demands and substance/alcohol misuse  
215 behaviour that associate with traditional male gender, especially after adolescence/marriage(20), and,  
216 (6) Societal attitude towards female adolescents and familial restrictions on behaviours of adolescent  
217 girls (21).

218 The findings of the present study indicate that self-reported recalled life-time repetition rate is  
219 9.5%(95% CI 6.7-12.2%). Examination of records confirmed that repetition rates at four weeks, one

220 year and two year were 1.9, 5.6 and 7.9 per hundred patients in KD, respectively. The life time  
221 repetition rate is higher compared to one year or two year repetition rate because repetitive attempts  
222 can occur at any point of life (22-24). Another potential reason for this is that the life time repetition  
223 rate was based on a referred hospital sample, which may have introduced a referral bias for patients  
224 with higher intent, whereas other rates were calculated for the entire KD, including patients  
225 presenting to primary rural hospitals many of who were not transferred to referral hospitals.

226 Almost all the previous studies conducted in SL were reported self-reported, life-time, recalled  
227 repetition rates. Though the method is different in this study, the self-reported life-time repetition  
228 rate of KD is close to the value reported from a socio-economically similar agricultural area published  
229 in a previous study, of 8.7% in North-Central Province (NCP)(25) and 7% in the Central and North  
230 Western Provinces(26). Two psychological autopsy studies conducted in the NCP (27) and Rathnapura  
231 (28) reported a higher lifetime value, of 26%. A telephone interview based study conducted at T.H.  
232 Peradeniya, SL, reported recalled one year repetition rate, 2.7% (29). Contextual and methodological  
233 difference partially explains the difference in rates.

234 Literature shows that repetition rate and excess risk carried by the previous attempt in a community  
235 differ on culture, geographical, location, outcome of suicidal behavior and the period of follow-up. A  
236 recent meta-analysis reported that, the estimated one year non-fatal repeat self-harm rate was  
237 considerably lower in Asian countries than in Western countries , 10% vs 16.3% (4). Similarly, lower  
238 repetition frequencies were reported among non-Western immigrants by a study conducted in seven  
239 European countries (30). Most of the Western countries reported higher repetition rates despite of  
240 their well developed medical, psychological and social services, compared to Asian countries including  
241 SL. It is possible that this is due to better ascertainment of cases gained through utilizing better medical  
242 records. However, with the robust methodology, our study's results reconfirms lower rates of  
243 repetition in Asia with considerable accuracy. Rates of repetition resulting in deaths are comparable  
244 in our study with those seen in the west.

245 Observed low rates of repetition may be partially explained through the synergistic effect of four main  
246 culture specific pillars; (1) characteristics of risk factors associated with suicidal behavior, (2)  
247 experiences faced at the initial post attempt period, (3) effect of attempt as a solution to the trigger,  
248 and, (4) continuing extended family support. However, in depth qualitative analysis is necessary to  
249 explain these cultural factors that are responsible for lower repetition rates compared to west.

250 1. Compared to the Western countries, involvement of risk factors in suicidal behavior may be  
251 different in Asian countries, including Sri Lanka(31). However, exact factors and their effect  
252 on lower repetition rate should be further explored.

253 2. Experiences faced at the initial post attempt period may have a robust effect on reducing  
254 repetitive attempts. A study reported that nearly half lost the wish to die after surviving the  
255 act (Hettiarachchi & Kodituwakku, 1989). A majority of the attempts take place at or around  
256 the victim's premises (32). Therefore, the situation is handled by the family members,  
257 relatives or other close individuals, up to the hospital admission. Moreover, the acts might  
258 improve the cohesion within the family at least for a short period and thus may prevent future  
259 events (33, 34). A significant proportion of all categories of health personnel expressed non-  
260 sympathy towards DSH patients (26). This non-sympathetic attitude may cause reluctance to  
261 seek health care. A significant proportion of those with DSH did not intend to end the life, but  
262 to change the situation on their advantage; therefore, they expect to seek medical  
263 interventions following attempts. In KD, 56% of patients thought that death would be unlikely  
264 if he/she received medical attention (5). Hence, the non-sympathetic attitude may discourage  
265 repetitive attempts. Though the repetitive attempts are lesser, repetitive suicidal ideation and  
266 threats may not be less.

267 3. A study conducted in Southern Sri Lanka revealed that, both boys and girls described suicidal  
268 attempt as a 'quick fix' to difficult interpersonal circumstances and visualized positive  
269 outcomes of it (35). Sri Lankan socio-cultural concept related to the response towards suicidal

270 behavior based on sympathetic grounds. And, 26% believed in solving the problem, arranging  
271 a marriage and fulfilling wishes, as the appropriate response (18). And, parents may change  
272 their parenting strategies to more supportive parenting strategies(36). Removal of the  
273 triggering factor may prevents repetitive suicidal behavior at least for a certain period.

274 4. Continuing extended family support may be a factor that helps to keep lifetime repetition rate  
275 at a lower level, which has been described as a potent psycho-therapeutic factor in Indian  
276 context (37, 38). Sri Lankan socio-cultural concept related to the response towards suicidal  
277 behavior based on sympathetic grounds. Examination of culture, gender and suicidal  
278 behaviour in Sri Lanka has suggested that both emotion focused and problem focused support  
279 is deemed needed for people who have attempted suicide, with a greater emphasis on  
280 emotion-focused support for females (18). Continuing family support throughout the  
281 adolescent years and after marriage through the extended family is an integral part of the Sri  
282 Lankan culture. Further, significant proportion give higher priority to family's requirements  
283 compared to their own needs. Therefore, majority of school adolescents perceived their  
284 families as intimate and close (60 %) and considered family as refuge (52%) for a problem (39).  
285 This may ensure the emotional warmth and bonds among the family member. Social support  
286 is well known protective factor for suicidal behavior. Hence, it might contributes to lower  
287 repetition rates.

288

289 A majority of the victims who had repetitive attempts were males, 56%. The opposite pattern was  
290 reported in NCP, female 61% (25). However, some authors reported that there was no significant  
291 difference across genders (40). Relatively higher repetition rates were reported among younger age  
292 groups in females and opposite pattern in males. Literature on psychological and socio-economical  
293 predictors of repetition showed that they are not different from the risk-factors of non-repetitive self-  
294 harm behavior (41).



295 The risk of repetition is higher in initial post event period. The median times to repetition within 1 year  
296 and 2 years were, 92 (IQR 10 - 238) and 191 (IQR 29 - 419.5) days respectively. The risk for repetition  
297 is highest in the first 3 to 6 months after a suicide attempt, but remained substantially elevated from  
298 the general population for at least 2 years (Bridge et al., 2006; Goldston et al., 1999; Lewinsohn,  
299 Rohde, & Seeley, 1996). The median time to repetition within 1 year was 105 days in Taiwan (Kwok,  
300 Yip, Gunnell, Kuo, & Chen, 2014).

301 The longer lengths of hospital stay in SL hospitals have been proposed by authors as a reason for  
302 observed difference with western countries (25). Similar to the current study findings, previous work  
303 has shown that the initial post attempt period carries the highest risk for repetition (42). Short hospital  
304 stay may expose the patient to the same environment that lead to the suicidal behavior. In England,  
305 half of the self-harm patients presenting to the emergency department were discharged without being  
306 admitted to hospital (43). In contrast, same day discharges were limited to 3% and 4% in THK and  
307 peripheral hospitals. The median hospital stay was reported as one day in western countries (4, 44,  
308 45), whereas it was 2 days in the KD. Hence, longer length of hospital stay can be considered as a valid  
309 argument for a lower repetition rate compared to western countries.

310 Higher case fatality of the first episode was a suggested explanation for the observed lower repetition  
311 rate (25). This explanation seems unlikely as there has been a significant reduction in case fatality rates  
312 over time whereas repetition rates have remained low. (10). If we assume all 221 suicides with  
313 poisoning, reported to police stations in 2011, survived following the initial event and had a repetitive  
314 event within a year, there would be 448 repetition cases within a year. Then, the one year repetition  
315 rate would be 11.1%, 95% CI: 10.2% to 12.1% and the value much lower to the one year repetition  
316 rate in Europe.

317 Suicide incidence of KD has been remained stable over the last decade, in 2012, 20.7/100,000 and the  
318 average value for 2001-2006 period, 21.3/100,000(14, 46) in the presence of rising trends of DSP(10).

319 This observation can be explained by three main mechanisms; (1) continuum of the reduction  
320 observed from 1996 with some of the actions taken in 1990s: such as restricting the import and sale  
321 of WHO Class I toxicity pesticides and decriminalization of suicide, (2) improvements of self-poisoning  
322 medical management, and, (3) shifting of methods from lethal pesticides to less lethal  
323 medicaments(10, 47). Male to female ratio of suicide incidences is similar to Europe and countries in  
324 American subcontinent, rather than Asian countries(15).Age standardized suicide incidence pattern is  
325 similar to national (14) as well as patter in most parts of the world (48-52).

326 Though there is a considerable amount of literature available to explain the risk factors that are  
327 responsible for higher rates of DSH in Sri Lanka, culture specific protective factors that leads to lower  
328 repetition rates are poorly explored. These protective factors should be further explored to explain  
329 the lower rates of repetition. These protective factors may provide a base to promising preventive  
330 strategies of DSH. Further, measures directed to prevention of repetition alone may not produce  
331 considerable impact on preventing suicidal behavior, in the presence of lower repetition rates.

332

### 333 **Limitations**

334 Data collection was conducted only in government hospitals. Less severe cases those may present to  
335 private-sector out-patient-care services might missed from data collection.

336 In calculating record based one and two year repetition rates; only the DSP admissions were  
337 considered for non-fatal events; not considering other methods of DSH, might have had an effect on  
338 lower rates. It has been suggested that individuals who attempt self-injury are more prone to  
339 repetitive attempts compared to those who attempt self-poisoning (53). However, this effect may not  
340 be be significant because more than 80% of DSH are due to poisoning and over dosage of medicines,  
341 and all fatal events were considered.

342 There are no unique patient identifiers in the provincial or national health system in Sri Lanka. The  
343 source of information, for the patient details, at the point of patient registration is the guardian and/or  
344 patient and there are no verifications or cross-checking. Because of the stigma, they might provide  
345 incomplete information to hide their identity. Therefore, validity and reliability of the identification  
346 details in health records may be limited. This may have affected the reliability of repetition matching  
347 process.

348

## 349 **Conclusion**

350 Repetition rate of DSH in Sri Lanka is very low, compared to Western countries and other countries in  
351 the region. Therefore, measures directed to prevention of repetition alone may not produce  
352 significant impact on preventing suicidal behavior. Culture specific protective factors that leads to  
353 lower repetition rates should be further explored and they may provide a base for promising  
354 preventive strategies of DSH.

355

## 356 **References**

357

- 358 1. Bertolote JM, Fleischmann A. A global perspective on the magnitude of suicide mortality. In:  
359 Wasserman D, Wasserman C, editors. Oxford textbook of suicidology and suicide prevention: a  
360 global perspective. illustrated ed: Oxford University Press; 2009. p. 91-8.
- 361 2. Bertolote JM, Fleischmann A. A global perspective in the epidemiology of suicide.  
362 Suicidologi. 2002;7(2):7-9.

- 363 3. La Vecchia C, Lucchini F, Levi F. Worldwide trends in suicide mortality, 1955-1989. *Acta*  
364 *Psychiatrica Scandinavica*. 1994;90(1):53-64.
- 365 4. Carroll R, Metcalfe C, Gunnell D. Hospital Presenting Self-Harm and Risk of Fatal and Non-  
366 Fatal Repetition: Systematic Review and Meta-Analysis. *PLoS ONE*. 2014;9(2):e89944.
- 367 5. Pushpakumara PHGJ. Epidemiological Pattern And Associates of Deliberate Self-Harm in  
368 Kurunegala District, Sri Lanka. Peradeniya, Sri Lanka: Faculty of Medicine, University of Peradeniya;  
369 2017.
- 370 6. Department of Census and Statistics Sri Lanka. Statistical Handbook: Kurunegala District -  
371 Population by Age groups and Gender within District - 2014 (Table : 2 .8). Colombo, Sri Lanka 2015  
372 [cited 2016]; Available from:  
373 <http://www.statistics.gov.lk/statistical%20Hbook/2015/Kurunegala/Table%202.8.pdf>.
- 374 7. Department of Census and Statistics Sri Lanka. Statistical Handbook: Kurunegala District -  
375 Information on Government Hospitals by Divisional Level - 2014 (Table : 8.1). Colombo, Sri Lanka:  
376 Department of Census and Statistics Sri Lanka; 2015; Available from:  
377 <http://www.statistics.gov.lk/statistical%20Hbook/2015/Kurunegala/Table%208.1.pdf>.
- 378 8. Hettige B, Karunananda AS, editors. Transliteration System for English to Sinhala Machine  
379 Translation. Second International Conference on Industrial and Information Systems (ICIIS 2007);  
380 2008 8-11 August 2007; University of Peradeniya, Sri Lanka.
- 381 9. Fernando SC, Dias G, editors. Inexact Matching of Proper Names in Sinhala. IEEE Region 10  
382 Colloquium and Th'ird International Conference on Industrial and Informat'ion Systems (ICIIS-2008);  
383 2007 December 8-10, 2008; Indian Institute of Technology, Kharagpur, India.
- 384 10. Knipe DW, Metcalfe C, Fernando R, Pearson M, Konradsen F, Eddleston M, et al. Suicide in  
385 Sri Lanka 1975–2012: age, period and cohort analysis of police and hospital data. *BMC public health*.  
386 2014;14(1):839.

- 387 11. Senarathna L, Buckley N, Jayamanna S, Kelly P, Dibley M, Dawson A. Validity of referral  
388 hospitals for the toxicovigilance of acute poisoning in Sri Lanka. Bull World Health Organ.  
389 2012;90(6):436-43A.
- 390 12. Department of Census and Statistics Sri Lanka. Chapter-2: Information related to Population  
391 Housing in District Statistical Hand Book Kurunegala. Colombo: Department of Census and Statistics-  
392 Sri Lanka, 2013.
- 393 13. Rajapakse T, Griffiths KM, Christensen H. Characteristics of non-fatal self-poisoning in Sri  
394 Lanka: a systematic review. BMC public health. 2013;13:133.
- 395 14. Sri Lanka Police. Sri Lanka Police: Crime Trends (Year 2005 to 2015). Colombo: Information  
396 Technology Division, Sri Lanka Police; 2016 [updated 19.3.2016; cited 2016 20.3.2016]; Available  
397 from: <http://www.police.lk/index.php/crime-trends>.
- 398 15. Varnik P. Suicide in the world. International journal of environmental research and public  
399 health. 2012;9(3):760-71. Epub 2012/06/13.
- 400 16. Khan MM. Suicide on the Indian Subcontinent. Crisis: The Journal of Crisis Intervention and  
401 Suicide Prevention. 2002;23(3):104–7.
- 402 17. Nastasi BK, Hitchcock JH, Burkholder G, Varjas K, Sarkar S, Jayasena A. Assessing  
403 Adolescents' Understanding of and Reactions to Stress in Different Cultures: Results of a Mixed-  
404 Methods Approach. School Psychology International. 2007;28(2):163-78.
- 405 18. Marecek J. Culture, gender, and suicidal behavior in Sri Lanka. Suicide and Life-Threatening  
406 Behavior. 1998;28(1):69-81.
- 407 19. Konradsen F, Hoek Wvd, Peiris P. Reaching for the bottle of pesticide—A cry for help. Self-  
408 inflicted poisonings in Sri Lanka. Social Science & Medicine. 2006;62(7):1710-9.
- 409 20. Marecek J. Young Women's Suicide In Sri Lanka: Cultural, Ecological, And Psychological  
410 Factors. Asian Journal of Counselling. 2006;13(1):63-92.

- 411 21. Houle J, Mishara BL, Chagnon F. An empirical test of a mediation model of the impact of the  
412 traditional male gender role on suicidal behavior in men. *Journal of Affective Disorders*. 2008;107(1-  
413 3):37-43.
- 414 22. Bridge JA, Goldstein TR, Brent DA. Adolescent suicide and suicidal behavior. *Journal of Child*  
415 *Psychology and Psychiatry*. 2006;47(3-4):372-94.
- 416 23. Goldston DB, Daniel SS, Reboussin DM, Reboussin BA, Frazier PH, Kelley AE. Suicide attempts  
417 among formerly hospitalized adolescents: A prospective naturalistic study of risk during the first 5  
418 years after discharge. *Journal of the American Academy of Child and Adolescent Psychiatry*.  
419 1999;38:660–71.
- 420 24. Lewinsohn PM, Rohde P, Seeley JR. Adolescent suicidal ideation and attempts: Prevalence,  
421 risk factors, and clinical implications. *Clinical Psychology Science and Practice*. 1996;3(25-36).
- 422 25. Mohamed F, Perera A, Wijayaweera K, Kularatne K, Jayamanne S, Eddleston M, et al. The  
423 prevalence of previous self-harm amongst self-poisoning patients in Sri Lanka. *Social psychiatry and*  
424 *psychiatric epidemiology*. 2011;46(6):517-20. Epub 2010/04/08.
- 425 26. de Silva HJ, Kasturiarachchi N, Seneviratne SL, Senaratne DC, Molagoda A, Ellawala NS.  
426 Suicide in Sri Lanka: points to ponder. *Ceylon Medical Journal*. 2000;45:17-24.
- 427 27. Abeyasinghe R, Gunnell D. Psychological autopsy study of suicide in three rural and semi-  
428 rural districts of Sri Lanka. *Social psychiatry and psychiatric epidemiology*. 2008;43(4):280-5. Epub  
429 2008/02/07.
- 430 28. Samaraweera S, Sumathipala A, Siribaddana S, Sivayogan S, Bhugra D. Completed suicide  
431 among Sinhalese in Sri Lanka: a psychological autopsy study. *Suicide & life-threatening behavior*.  
432 2008;38(2):221-8.
- 433 29. Rajapakse TN, Griffiths KM, Cotton S, Christensen H. Repetition rate after non-fatal self-  
434 poisoning in Sri-Lanka: a one year prospective longitudinal study. *The Ceylon Medical Journal*.  
435 2016(61):154-8.

- 436 30. Lipsicas CB, Mäkinen IH, Wasserman D, Apter A, Kerkhof A, Michel K, et al. Repetition of  
437 Attempted Suicide Among Immigrants in Europe. *Can J Psychiatry*. 2014;59(10):539-47.
- 438 31. Chen Y-Y, Chien-Chang Wu K, Yousuf S, Yip PSF. Suicide in Asia: Opportunities and  
439 Challenges. *Epidemiologic reviews*. 2012;34(1):129-44.
- 440 32. Mohamed F, Manuweera G, Gunnell D, Azher S, Eddleston M, Dawson A, et al. Pattern of  
441 pesticide storage before pesticide self-poisoning in rural Sri Lanka. *BMC public health*. 2009;9:405.  
442 Epub 2009/11/06.
- 443 33. Franic T, Dodig G, Kardum G, Marcinko D, Ujevid A, Bilušid M. Early Adolescence and Suicidal  
444 Ideations in Croatia: Sociodemographic, Behavioral, and Psychometric Correlates. *Crisis: The Journal*  
445 *of Crisis Intervention and Suicide Prevention*. 2011;32(6):334-45.
- 446 34. Lee AY, Pridmore S. Suicide and gender ratios in Tasmania (Australia) using the  
447 Operationalized Predicaments of Suicide tool, and negative experiences. *Australasian Psychiatry*.  
448 2014;22(2):140-3.
- 449 35. Senadheera C, editor. Deliberate self-harm of children and adolescents: a hospital based  
450 study. *Suicide in Sri Lanka: Past, Present and Future Transformations*; 2013; University of Colombo:  
451 Department of Sociology, University of Colombo.
- 452 36. Ferrey AE, Hughes ND, Simkin S, Locock L, Stewart A, Kapur N, et al. Changes in parenting  
453 strategies after a young person's self-harm: a qualitative study. *Child Adolesc Psychiatry Ment*  
454 *Health*. 2016;10(20).
- 455 37. Sethi B. FAMILY AS A POTENT THERAPEUTIC FORCE. *Indian Journal of Psychiatry*.  
456 1989;31(1):22-30.
- 457 38. Chadda RK, Deb KS. Indian family systems, collectivistic society and psychotherapy. *Indian*  
458 *Journal of Psychiatry*. 2013;55(Suppl 2):S299-309.
- 459 39. Thalagala N, Rajapakse L, Yakandawala H. National Survey on Emerging Issues among  
460 Adolescents in Sri Lanka. Colombo, Sri Lanka: UNICEF Sri Lanka, 2004.

- 461 40. Nordentoft M, Branner J. Gender differences in suicidal intent and choice of method among  
462 suicide attempters. *Crisis: The Journal of Crisis Intervention and Suicide Prevention*. 2008;29(4):209-  
463 12.
- 464 41. Larkin C, Blasi ZD, Arensman E. Risk Factors for Repetition of Self-Harm: A Systematic Review  
465 of Prospective Hospital-Based Studies. *PLoS ONE*. 2014;9(1):e84282.
- 466 42. Gilbody S, House A, Owens D. The early repetition of deliberate self harm. *J R Coll Physicians*  
467 *Lond*. 1997;31(2):171-2.
- 468 43. Gunnell D, Bennewith O, Peters TJ, House A, Hawton K. The epidemiology and management  
469 of self-harm amongst adults in England. *J Public Health (Oxf)*. 2005;27(1):67-73.
- 470 44. Carter GL, Whyte IM, Ball K, Carter NT, Dawson AH, Carr VJ, et al. Repetition of deliberate  
471 self-poisoning in an Australian hospital-treated population. *Med J Aust*. 1999;170(7):307-11.
- 472 45. Gunnell DJ, Brooks J, Peters TJ. Epidemiology and patterns of hospital use after parasuicide  
473 in the south west of England. *J Epidemiol Community Health*. 1996;50(1):24-9.
- 474 46. Registrar General's Department-Sri Lanka. *Bulletin of Vital Statistics*. Colombo: Registrar  
475 General's Department, Ministry of Public Administration & Home Affairs- Sri Lanka, Department RGs;  
476 2010.
- 477 47. de Silva VA, Senanayake SM, Dias P, Hanwella R. From pesticides to medicinal drugs: time  
478 series analyses of methods of self-harm in Sri Lanka. *Bulletin of the World Health Organization*.  
479 2012;90:40-6.
- 480 48. Vijayakumar L. *Suicide in Asia: Causes and Prevention*. Hong Kong, China: Hong Kong  
481 University Press; 2008.
- 482 49. Hawton K, Van Heeringen K. Suicide. *Lancet*. 2009;373(9672):1372-81.
- 483 50. De Leo D, Padoani W, Scocco P, Lie D, Bille-Brahe U, Arensman E, et al. Attempted and  
484 completed suicide in older subjects: results from the WHO/EURO Multicentre Study of Suicidal  
485 Behaviour. *International Journal of Geriatric Psychiatry*. 2001;16(3):300-10.



- 486 51. Dombrowski AY, Szanto K, Duberstein P, Conner KR, Houck PR, Conwell Y. Sex Differences in  
 487 Correlates of Suicide Attempt Lethality in Late Life. *American Journal of Geriatric Psychiatry*.  
 488 2008;16(11):905–13.
- 489 52. Wasserman D, Cheng Q, Jiang G-X. Global suicide rates among young people aged 15-19.  
 490 *World Psychiatry*. 2005;4:114-20.
- 491 53. Lilley R, Owens D, Horrocks J, House A, Noble R, Bergen H, et al. Hospital care and repetition  
 492 following self-harm: multicentre comparison of self-poisoning and self-injury. *The British Journal of*  
 493 *Psychiatry*. 2008;192(6):440-5.

494

495

## 496 Supplemental tables

497

Age	Repetition rate as a % (95% CI)								
	4 Weeks			1 Year			2 Years		
	Male	Female	All	Male	Female	All	Male	Female	All
10-14	2.4 (-2.2 to 7.0)	0 (0 to 0)	0.8 (-0.7 to 2.2)	2.4 (-2.2 to 7.0)	3.3 (-0.4 to 7.0)	3.0 (0.1 to 5.9)	2.4 (-2.2 to 7.0)	6.7 (1.5 to 11.8)	5.3 (1.5 to 9.1)
15 - 19	1.0 (0.0 to 2.0)	2.2 (1.1 to 3.3)	1.8 (1.0 to 2.5)	6.8 (4.3 to 9.3)	6.3 (4.6 to 8.1)	6.5 (5.0 to 7.9)	10.1 (7.1 to 13.0)	9.3 (7.2 to 11.5)	9.6 (7.9 to 11.3)
20 - 24	2.1 (0.7 to 3.5)	0.5 (-0.2 to 1.2)	1.3 (0.5 to 2.0)	5.2 (3.0 to 7.5)	5.1 (3.0 to 7.3)	5.2 (3.6 to 6.7)	7.9 (5.2 to 10.6)	6.9 (4.4 to 9.3)	7.3 (5.5 to 9.2)
25 - 29	1.1 (-0.1 to 2.3)	2.4 (0.5 to 4.3)	1.7 (0.6 to 2.9)	6.3 (3.4 to 9.2)	4.4 (1.9 to 7.0)	5.4 (3.4 to 7.3)	8.1 (4.9 to 11.4)	6.1 (3.1 to 9.0)	7.1 (4.9 to 9.4)
30 - 34	3.0 (0.6 to 5.4)	2.4 (0.1 to 4.7)	2.7 (1.1 to 4.4)	6.6 (3.1 to 10.0)	3.6 (0.8 to 6.4)	5.2 (2.9 to 7.5)	9.1 (5.1 to 13.1)	4.8 (1.5 to 8.0)	7.1 (4.5 to 9.7)
35 - 39	2.2 (0.1 to 4.3)	2.1 (-0.8 to 5.1)	2.2 (0.5 to 3.9)	8.8 (4.7 to 13.0)	5.4 (0.8 to 10.0)	7.7 (4.5 to 10.8)	11.0 (6.5 to 15.6)	5.4 (0.8 to 10.0)	9.1 (5.7 to 12.5)

40 - 44	0.8 (-0.8 to 2.4)	0 (0 to 0)	0.6 (-0.5 to 1.7)	2.5 (-0.3 to 5.2)	2.0 (-1.8 to 5.8)	2.3(0.1 to 4.6)	5.8 (1.6 to 9.9)	3.9 (-1.4 to 9.2)	5.2 (1.9 to 8.6)
45 - 49	2.7 (-0.3 to 5.7)	4.9 (-1.7 to 11.5)	3.3 (0.4 to 6.1)	7.2 (2.4 to 12.0)	4.9 (-1.7 to 11.5)	6.6 (2.6 to 10.5)	7.2 (2.4 to 12.0)	9.8 (0.7 to 18.8)	7.9 (3.6 to 12.2)
50 - 54	4.7 (0.7 to 8.7)	0 (0 to 0)	3.5 (0.5 to 6.5)	8.5 (3.2 to 13.8)	2.8 (-2.6 to 8.1)	7.0 (2.8 to 11.2)	12.3 (6.0 to 18.5)	2.8 (-2.6 to 8.1)	9.9 (4.9 to 14.8)
55 - 59	5.1 (-0.5 to 10.7)	0 (0 to 0)	4.0 (-0.4 to 8.5)	11.9 (3.6 to 20.1)	6.7 (-5.9 to 19.3)	10.8 (3.7 to 17.9)	18.6 (8.7 to 28.6)	6.7 (-5.9 to 19.3)	16.2 (7.8 to 24.6)
60 - 64	9.4 (-0.7 to 19.5)	0 (0 to 0)	7.3 (-0.6 to 15.3)	12.5 (1.0 to 24.0)	0 (0 to 0)	9.8 (0.7 to 18.8)	12.5 (1.0 to 24.0)	0 (0 to 0)	9.8 (0.7 to 18.8)
65 - 69	0 (0 to 0)	0 (0 to 0)	0 (0 to 0)	4.5 (-4.2 to 13.2)	0 (0 to 0)	2.9 (-2.7 to 8.6)	4.5 (-4.2 to 13.2)	0 (0 to 0)	2.9 (-2.7 to 8.6)
70 - 74	0 (0 to 0)	0 (0 to 0)	0 (0 to 0)	0 (0 to 0)	0 (0 to 0)	0 (0 to 0)	5 (-4.5 to 14.5)	0 (0 to 0)	4.2 (-3.8 to 12.2)
75 - 79	20 (-15.1 to 55.1)	0 (0 to 0)	11.1 (-9.4 to 31.6)	20 (-15.1 to 55.1)	0 (0 to 0)	11.1 (-9.4 to 31.6)	20 (-15.1 to 55.1)	0 (0 to 0)	11.1 (-9.4 to 31.6)
80 & over	50 (1 to 99)	0 (0 to 0)	22.2 (-4.9 to 49.4)	50 (1 to 99)	0 (0 to 0)	22.2 (-4.9 to 49.4)	50 (1 to 99)	0 (0 to 0)	22.2 (-4.9 to 49.4)
Total	2.2 (1.5 to 2.8)	1.7 (1.1 to 2.2)	1.9 (1.5 to 2.3)	6.4 (5.3 to 7.4)	5.0 (4.0 to 5.9)	5.7 (5.0 to 6.4)	8.8 (7.6 to 10.1)	7.0 (5.9 to 8.2)	7.9 (7.1 to 8.8)

498 Table 2: four weeks, one year and two year repetition rates by age and sex





