National Suicide Registry Malaysia (NSRM)

Annual Report 2009

With contribution from

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NATIONAL SUICIDE REGISTRY MALAYSIA (NSRM)
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MINISTRY OF HEALTH MALAYSIA
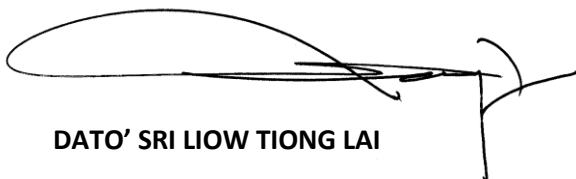
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FOREWORD

Suicide is a rare phenomenon with a high impact: Apart from the mental anguish and suffering experienced by families due to the sudden death to their loved ones, the healthcare costs needed to handle these cases may be tremendous and the public interest can be very acute. Thus, it is a worthwhile focus of investigations for health professionals in Malaysia.

However, the death investigation process requires intellectual and clinical integrity to ensure that false cases are not being reported. There are many types of self-destructive behaviour that may not involve a conscious wish to die; and deaths in these cases are actually 'accidental' or may even be undetermined. Thus, the National Suicide Registry Malaysia (NSRM) had strived to create a platform to facilitate the forensic medicine services – with assistance from the psychiatric fraternity – in the recognition, determination and reporting of deaths by suicide.

The Ministry of Health Malaysia had initiated the NSRM in 2007: its team members include officers from the Forensic Services, which is the main anchor of this project; and the Psychiatry and Mental Health Services for scientific and organisational inputs. Meanwhile the Clinical Epidemiology Unit of the Clinical Research Centre gave input on technical aspects, methodology and data analysis. The team had also received assistance from the Public Health Division and the Institute of Health and Behaviour Sciences during the initial phase.

The NSRM is a fairly 'young' registry: this report is the second full calendar-year of data collected by all forensic units under the purview of the Ministry of Health Malaysia. Under-reporting may still be an issue. Nevertheless, with capacity building of the forensic services and progress in information technology-assisted health documentation, it is hoped that the NSRM would be able to report with increasing accuracy the prevalence; identify the high-risk groups; and illustrate trends in suicidal behaviour over time in Malaysia. From a health-systems view, this exercise can also provide an insight into the efficiency of the healthcare services in managing suicide cases and the documentation of the cause of death. Hopefully, the identification of associated factors will lead to the development of prevention strategies that would be most appropriate for this country.

I invite you to reflect on the data presented in this report which will hopefully inspire some of you to do more research on death investigation. As the medical services in Malaysia progress, it would also be good for us to become more mindful of the population we are treating – and I believe that studies in suicidology can provide a lot of opportunities for that.

DATO' SRI LIOW TIONG LAI

ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

There were 328 cases of suicide deaths reported in 2009; which was a suicide rate of 1.18/ 100,000 population. The age range of the victims was 14 to 94 years, with a mean of 39.8 years. There were more men than women; the gender ratio was 3:1 (males: females). Eighty-nine per cent of suicide victims were Malaysian citizens. Among the foreigners, the Indonesians and Nepalese contributed the highest numbers with 4.3% or 14 deaths and 3% or 10 deaths respectively.

In terms of ethnicity, the Indians had the highest suicide rate at 3.67/100,000 Indian population (70 deaths); followed by the Chinese at 2.44/100,000 Chinese population (156 deaths). The Malays and the Bumiputera of Sabah and Sarawak had lower rates of 0.32/100,000 Malay population (44 deaths) and 0.37/100,000 Bumiputera Sabah and Sarawak population (11 deaths) respectively.

Estimated calculations for the different categories of marital status showed that the divorced or separated group contributed the highest rate at 18.33/100,000 population or 23 deaths. Suicide rates among the widowed were 1.92/100,000 population or 13 deaths; for married group it was 1.64 or 151 deaths and for the single it was 1.01 per 100,000 population or 134 deaths.

Sixty-eight % of the suicide victims (1.99/100,000 population or 168 deaths) had received secondary education. This was followed by those who did not have any formal education at 1.09/ 100,000 population or 23 deaths. By employment status, 52.8% or 69 cases were employed at the time of their suicide. Eighty-one cases or 25.3% were unemployed.

Most of the suicide cases (78.7% or 258 cases) were brought in dead. Meanwhile 18% or 59 cases died in ward and 3.4% or 11 cases died at the Emergency Department. It is difficult to comment on the time of suicide act because time could only be estimated for 43.6% or 143 cases. The most common place to commit suicide was the home (70.2% or 221 deaths); followed by the residential institutions at 10.2% or 32 deaths.

Special circumstances for suicide were quite rare: suicide pacts occurred in 9 deaths (2.7%) while homicide-suicides occurred in 5 deaths (1.5%). The rest of the victims committed suicide on their own. Suicide by hanging was the most common method for both men and women, accounting for 54% of all suicides. Other methods were pesticide poisoning which was used in 13.11% or 43 deaths and jumping from high places (10.37 % or 34 deaths).

Only 33.5% of victims expressed their suicidal intentions; usually verbally (55.1% or 65 cases) or through suicide notes (15.3% or 18 cases). For the majority of victims (78.6%) it was not known whether they had any previous suicide attempts.

History of substance abuse was present in 35.5% or 83 cases. Within this group, alcohol is the most common substance used (60.5% or 49 cases). Twenty-eight per cent or 70 cases have history of physical illness. The illnesses reported were hypertension (14.3% or 10 cases), asthma (12.9% or 9 cases); and cancer (11.4% or 8 cases).

Mental illness was present in 72 suicide deaths (22%). Of this number, 11.6% or 38 cases had depression and 7% or 23 cases had schizophrenia. Only 23 victims were reported to have had family history of mental illness or suicide.

Under-reporting may be ubiquitous in suicidal death investigation; and the NSRM will continue to audit and improve its processes so that data quality can be improved. This should move in tandem with other strategies carried out by the Ministry of Health to improve death documentation: e.g. capturing data from

non-certified deaths; equipping the forensic medicine services with the necessary information technology infrastructure and staffing; and in-service training for health professionals on diagnostic terminologies.

Nevertheless, suicidal behaviour covers a spectrum of thoughts, communications and acts. The NSRM is studying the least common form of suicidal behaviour: the completed suicides. Malaysia needs more data on non-fatal self-harm and suicidal ideations; and who among those cohorts will ultimately die by suicide. This will give a more holistic picture about the patterns of suicidal behaviour in Malaysia.

The WHO had outlined that the effective usage of registries includes: establishing records, following up cases, and providing data on frequency and trends.   Even in the absence of a defined population base, useful information may be obtained from registers on the natural course of disease (World Health Organization, 1967).   Thus, the NSRM hopes to gradually contribute to a strong death database, specifically for suicide.

INTRODUCTION

Dr Nor Hayati Ali, Dr Norhayati Nordin

ABOUT THE NSRM

The National Suicide Registry Malaysia (NSRM), officially launched in 2007, compiles the census of suicidal deaths that occur in Malaysia via a **nationwide** system of medical forensics units and departments. Due to the complex nature of suicide, development of the NSRM had required inputs and continued commitment from several agencies within the Ministry of Health Malaysia, as depicted in Figure 1. This is a rather unique arrangement, because clinical registries in Malaysia are usually supported by clinicians or administrators within the same discipline. The components of the project structure are as follows:
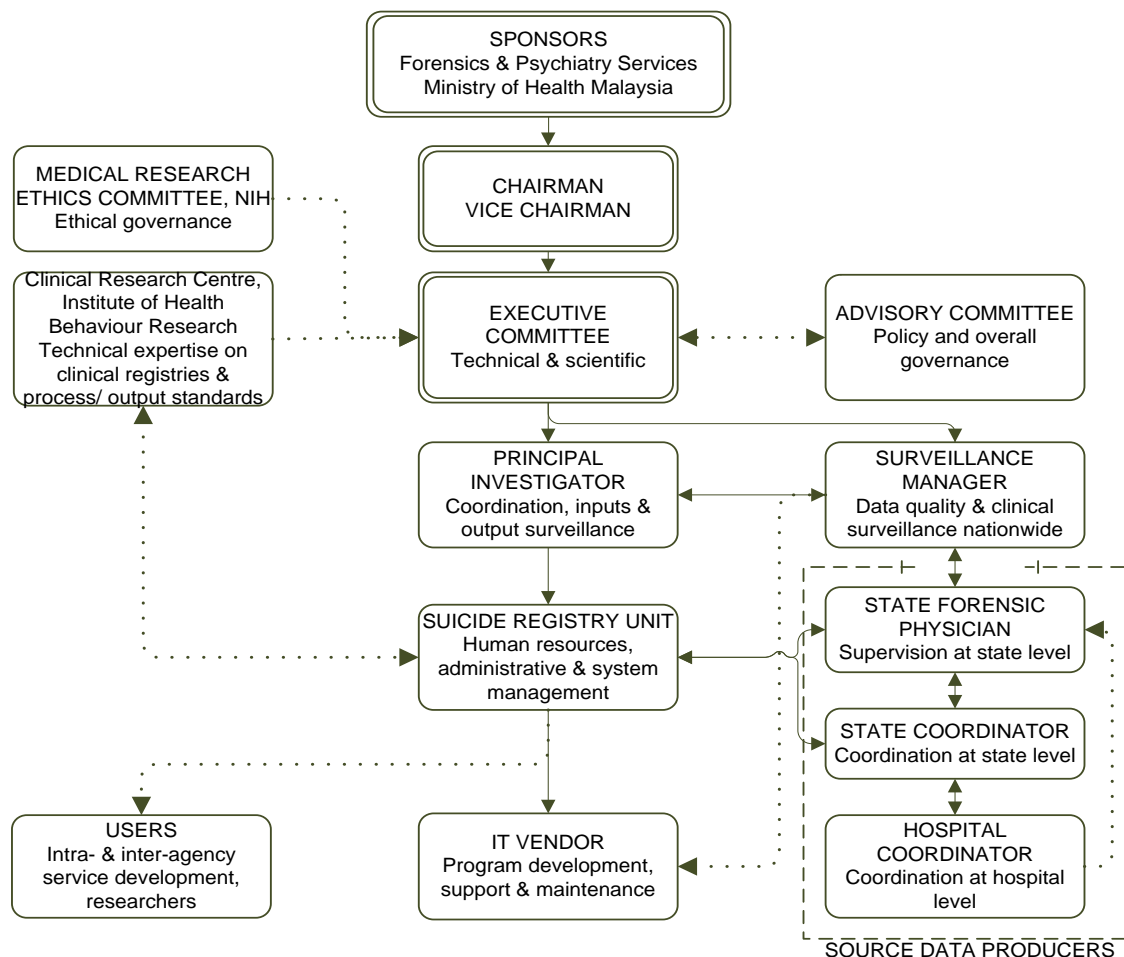
Figure 1: Project structure for NSRM

Sponsors refer to the agencies which developed and advocated for the National Suicide Registry Malaysia (NSRM). The NSRM is co-sponsored by the Psychiatry and Mental Health Services (via its National Mental Health Registry officers) and Forensic Medicine Services of the Ministry of Health Malaysia. It is supported and monitored by the Clinical Research Centre via its Clinical Epidemiology Unit in the areas of clinical epidemiology, biostatistics and technical aspects of the project. In view of this, the NSRM is affiliated with the Clinical Research Centre's (CRC) Network of Registries.

The NSRM is governed by an **Advisory Committee**, consisting of officers from the Ministry of Health agencies: the Medical Development Division, Non-Communicable Disease Department, CRC, IBHR,

Forensic Medicine Services, Psychiatry and Mental Health Services, Accident and Emergency Services; academicians; the Royal Malaysian Police and members of the NSRM Executive Committee. Its role is providing governance to ensure that the NSRM stay focused on its objectives and to assure the latter's continuing relevance and justification.

The **Executive Committee** combines the functions of the Expert Panel and the Steering Committee of the NSRM. It provides scientific and clinical input to the project; ensures good technical and scientific basis of the registry; interprets results and prepares report; ensures that the registry is run according to its stated aims, objectives and protocols; ensures that rights of patients are respected; oversees the progress of the project, provides leadership and takes on the decision-making responsibility for the registry.

The Suicide Registry Unit (SRU) is the central coordinating centre for collection and analysis of data. This unit will also handle the documentation and administrative needs of the NSRM.

Source Data Producers are the individuals or institutions that collect the required data i.e. the Forensic Units or Departments in Malaysian hospitals. The NSRM had prepared materials and had held trainings to ensure that the registry is systematic and uniform.

OBJECTIVES OF THE NSRM

The NSRM aims to:

1. Determine the incidence of suicide in Malaysia.

2. Determine the factors that are associated with suicide i.e. demographics, social factors and risk factors (psychiatric illness, physical illness, and life events).

3. Identify trends in methods of suicide and provide recommendations for intervention, promotion and prevention based on the above findings.

METHODOLOGY

In describing suicide, the World Report on Violence and Health cited a well-known definition by Encyclopaedia Britannica (1973) and quoted by Schneidman (1981), i.e.: ''the human act of self-inflicting one's own life cessation''. The intention to die is a key element. Unless the deceased have made clear statements before their death about their intentions, it is extremely difficult to reconstruct the thoughts of people who had already died (Cavanagh, Carson, Sharpe, & Laurie, 2003; World Health Organization, 2002). In many legal systems, a death is certified as suicide if the circumstances are consistent with suicide and if murder, accidental death and natural causes are all ruled out (Department of Health and Human Services, 2003).

The diagnosis will be based on a post-mortem examination of the dead body and other supporting evidence that shows a preponderance of evidence indicating the intention to die. It is classified according to Chapter XX of ICD-10[1] i.e. External Causes of Mortality and Morbidity (codes X 60-X 84) (World Health Organization, 2007).

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[1] **The International Statistical Classification of Diseases and Related Health Problems version 10**

INSTRUMENT

Data is collected via a structured Case Report Forms (CRFs) which has an accompanying instruction manual to ensure systematic and efficient data collection. The suicide rate per year is the number of residents' suicidal deaths recorded during the calendar year divided by the resident population – as reported in the official Malaysian National Statistics Department census figures – and multiplied by 100,000 (World Health Organization, 2009).

Regional and national-level training had been carried out periodically on recognition of cases, developing standard operating procedures to capture the data, interview techniques and practical sessions in filling out the CRF.

DATA FLOW PROCESS

The national-level data collection is coordinated by the Suicide Registry Unit (SRU). At the state level, there is a parallel data collection effort coordinated by the State Forensic Physician's office, which is managed by the "State Coordinator" for each state. The State Coordinator shall appoint staffs from the forensic unit of other hospitals under their jurisdiction to handle data collection at the district or satellite level.

All forensic departments or units that carry out data collection will be categorised as a Source Data Producer (SDP). They collect data via interviews with the family members, significant others, or police; as well as from the review of medical records or other official documents. The relevant variables were recorded in the paper-based CRF. The SRU will track data returns and prompt State Coordinators to submit data whenever they fall behind schedule in reporting data. Data protection procedure had been put in place, following standard disease registration practice, and in compliance with applicable regulatory guidelines.

STATISTICAL METHOD

This is a descriptive report using descriptive statistical analysis. All data were described in terms of frequency and percentages except for continuous data, like age and time of suicide. We calculated summary statistics like mean, standard deviation, median (50th percentile), mode and minimum & maximum value for age. Missing data was ignored and the analysis confined to available data. Therefore, no imputation was done. The analysis was done using STATA programme (version 9) and Microsoft Excel.

CHAPTER 1: PREVALENCE

Dr Nor Hayati Ali

This is the second full calendar year of data collection for the registry. As shown in **Table 1**, the number of cases registered during this period increased to 328 compared with 290 in 2008 (National Suicide Registry Malaysia, 2009). Given the estimated population of 27.8 million for 2009 (Department of Statistics 2009), suicide rate for the whole country was 1.18/ 100,000 population.

The suicide rates generated by this registry may seem low, especially when compared with some Asian countries that have very high rates of suicide e.g. South Korea (31.1/ 100,000) and Japan (24.4/100,000) (World Health Organization, 2009). Nevertheless, the WHO had reported that the average world suicide rate is 10.07/ 100,000 population. On the other hand, countries with a majority-Muslim population; e.g. Jordan (1.1/ 100,000) and Kuwait (2.0/100,000) do have low suicide rates (World Health Organization, 2009). Being a multi-racial country, the suicide rates in Malaysia may be between these two extremes.

The low rates may also be due to the fact that NSRM only captures data from deaths which are medically certified; which is approximately 57.5% of all deaths in Malaysia (Department of Statistics Malaysia, 2010). It is beyond the capacity of this registry to capture suicide data among deaths which were not medically certified; which involves lay certifiers – usually police officers. In addition, registration requires a preponderance of evidence showing that the deceased had indicated intent to die. Thus, deaths with "undetermined intent" had been excluded from this registry.

The distribution of cases according to states (please refer Table 1) showed that Johor had registered the biggest number of suicide deaths at the rate of 2.69/ 100,000 population or 88 deaths. This is followed by Penang at 2.41/ 100,000 or 38 deaths. Kelantan had the lowest rate with 0.18/100,000 population.

Table 1: Number, Percentage and Incidence Rate of Suicide by States. National Suicide Registry Malaysia (NSRM), 2009

No.	Items	N	%	Population*	Incidence Rate (per 100,000 population)
1	No. of Suicide Death	328	100.00	27,895,300	1.18
2	**Distribution of Cases by States**				
2.1	Johor	88	26.8	3,269,100	2.69
2.2	Kedah	30	9.2	1,942,600	1.54
2.3	Kelantan	3	0.9	1,639,000	0.18
2.4	Melaka	17	5.2	761,600	2.23
2.5	N. Sembilan	5	1.5	1,000,300	0.50
2.6	Pahang	20	6.1	1,516,700	1.32
2.7	Perak	47	14.3	2,427,600	1.94
2.8	Perlis	3	0.9	237,000	1.27
2.9	Pulau Pinang	38	11.6	1,580,000	2.41
2.10	Sabah	24	7.3	3,278,200	0.73
2.11	Sarawak	6	1.8	2,470,800	0.24
2.12	Selangor	25	7.6	5,033,500	0.50
2.13	Terengganu	4	1.2	1,035,800	0.39
2.14	W. P Kuala Lumpur	18	5.5	1,703,100	1.06
	Total	328	100.0	27,895,300	1.18

Population projection 2000 census, revised 2010, Department Of Statistics

CHAPTER 2: DEMOGRAPHICS

Dr Yushada Budiman, Dr Nor Hayati Arif, Dr Nor Hayati Nordin, Dr Sharifah Suziah Syed Mokhtar

2.1   GENDER DISTRIBUTION

The gender ratio was slightly lower for 2009 compared with 2008. Preponderance of males; with a male to female ratio of approximately 2.9:1 (N.H. Ali et al (2012). This finding was similar to the findings obtained in Thailand in 2002 and in Singapore in 2006 (World Health Organization 2010, Jose 2002)

2.2   AGE DISTRIBUTION

The highest rate of suicide was in the 35-44 age group (1.95) followed by the 75+ age group (1.93). The youngest case was 14 years of age and the oldest was 94 years old (N.H. Ali et al (2012).

2.3   ETHNIC GROUPS OF MALAYSIAN CITIZENS

The suicide rate was highest among Indians (3.67/100,000) followed by Chinese (2.44/100,000) and Malays (0.32/100,000) (N.H. Ali et al (2012). This was consistent with findings from other studies in Malaysia (Maniam 1995) and Singapore (World Health Organization 2010).

2.4   CITIZENSHIP

In 2009, 10.7% of suicides were by non-citizens. The citizens from two countries i.e. Indonesia and Nepal accounted for 68.6% of suicides among non-Malaysians (N.H. Ali et al (2012).

2.5   MARITAL STATUS

The highest rate of suicides was in the divorced/separated group (18.33/100,000) followed by the widowed group (1.92/100, 000) (N.H. Ali et al (2012). People who were divorced or separated were more likely to commit suicide than those who were married (Kposowa 2000, Schapira 2001)

2.6   EDUCATION LEVEL

Education level was not known for 24% (n=79) of cases. Most of the suicides had at least secondary education (1.99/100,000 population) (N.H. Ali et al (2012).

2.7   RELIGION

The highest rate of suicide was among the Hindus followed by the Buddhists. The ethnic distribution above showed highest rate of suicide in Indians and most Malaysian Indians are Hindus. The lowest rate of suicide was among the Muslims (0.53/100,000 population) (N.H. Ali et al (2012). In Muslim countries, where committing suicide is strictly forbidden, suicide rates were close to zero (Jose 2002).

2.8   EMPLOYMENT STATUS

Data on employment status were available in 320 cases. Slightly more than half of suicide victims (52.8%) were fully employed followed by the unemployed group (25.3%) (N.H. Ali et al (2012). This finding is contrary to most literature that shows that unemployment increases the risk of suicide (Glyn 1998)

CHAPTER 3: CHARACTERISTICS OF THE SUICIDAL ACT

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3.1   PLACE OF SUICIDE ACT

Table 2: Distribution of Place of Suicide Act

Place of Suicide Act	N	%
Farm / Plantation	16	4.9
Home	221	67.4
Industrial / Construction Area	2	0.6
Residential Institution	32	9.8
School/ Other Institution/ Public Administrative Areas	15	4.6
Street / Highway	6	1.8
Trade Service Areas	17	5.2
Others	6	1.8
Missing (Unspecified place)	13	4.0
TOTAL	328	100.0

The data obtained showed that, majority of suicides took place at the home of the deceased (67.4%; n=221), followed by residential institution 9.8% (n=32) and farm/plantation 4.9% (n=16) and trade service area 5.2% (n=17). It will be interesting to further analyse the data to determine whether those who committed suicide at home hanged themselves, although this is most likely to be the choice of suicide at home. Similarly, for those who took poisons; they did it at a farm/plantation, because of the accessibility of poisons such as herbicides at a farm/plantation.

3.2   CHOICE OF SUICIDE METHODS

Table 3: Distribution of Choice of Suicide Methods

	Methods of Suicide	N	%
X60	ISP by and exposure to nonopiod analgesic, antipyretics and anti rheumatics	3	0.91
X61	ISP by and exposure to antiepiliptics, sedative-hypnotic, antiparkinson and psychotropic drugs, not elsewhere classified.	2	0.61
X63	ISP by and exposure to other drugs acting on the automatic nervous system	1	0.30
X64	ISP by and exposure to other and unspecified drugs, medicaments and biological substances	1	0.30
X66	ISP by and exposure to organic solvents and halogenated hydrocarbons and their vapours	4	1.22
X67	ISP by and exposure to other gases and vapours (e.g. carbon monoxide)	12	3.66
X68	ISP by and exposure to pesticides	43	13.11
X69	ISP by and exposure to other an unspecified chemicals and noxious substances	20	6.10
X70	ISH by hanging, strangulation, and suffocation	176	53.66
X71	ISH by drowning and submersion	6	1.83
X72	ISH by handgun discharge	3	0.91
X73	ISH by rifle, shotgun and larger firearm discharge	2	0.61
X76	ISH by smoke, fire and flames	7	2.13
X78	ISH by sharp object	10	3.05
X80	ISH by jumping from a high place	34	10.37
X81	ISH by jumping or lying before moving object	5	1.52
X84	X84 ISH by unspecified means	1	0.30
	TOTAL	330	100.0

A person can have multiple methods, hence total % exceeds 100%

All the suicidal methods for this registry were reported according to the ICD-10 classification. This study shows, that the most favoured suicide method among Malaysian is classified as X70 (ISH by hanging, strangulation and suffocation). By referring to the Table 11, it shows that 53.6% (n=176) out of 328 cases were within the X70 classification. Similarly, according to the National Suicide Statistic at a Glance, Percentage of Self-harm Injuries 2002-2006, suffocation was the second highest method of suicide in the United States. A study of suicide in the northern part of Thailand showed similar results to ours; whereby the most common method of suicide was hanging, followed by pesticide ingestion (Lotrakul 2005).

The second widely chosen method was X68 (exposure to pesticide) at 13.1% (n =43) and followed closely by X80 (jumping from high places) which makes up 10.4% (n=34) of the suicide cases. These three common methods of suicide contribute to 77.1% of the total suicide cases. These may be attributed to the availability of hanging appliances, as well as accessibility to high-rise buildings and pesticides in Malaysia. This study also confirms the reported trend published in the NSRM Preliminary Report 2007 and NSRM Annual Report 2008.

The other suicide methods found in this study were exposure to X67 (gases and other vapours), X76 (smoke, fire and flames), X71 (drowning), X69 (exposure to unspecified chemicals & other noxious substance), X81 (jump/lying before moving object), X78 (sharp objects), X72 (handgun discharge), X73 (rifle, shotgun or other larger firearm) and X61 (exposure to antiepileptics, sedative, hypnotics, psychotropics).

3.2.1 SUICIDE METHOD VS. GENDER

No.	Methods of Suicide	Female			Male			Total		
		N	% Gender	% Method	N	% Gender	% Method	N	% Gender	% Method
X60	ISP by and exposure to nonopiod analgesic, antipyretics and anti rheumatics	3	100.0	0.9	0	0.0	0.0	3	100.0	0.9
X61	ISP by and exposure to antiepiliptics, sedative-hypnotic, antiparkinson and psychotropic drugs, not elsewhere classified.	1	50.0	0.3	1	50.0	0.3	2	100.0	0.6
X63	ISP by and exposure to other drugs acting on the automatic nervous system	0	0.0	0.0	1	100.0	0.3	1	100.0	0.3
X64	ISP by and exposure to other and unspecified drugs, medicaments and biological substances	0	0.0	0.0	1	100.0	0.3	1	100.0	0.3
X66	ISP by and exposure to organic solvents and halogenated hydrocarbons and their vapours	1	25.0	0.3	3	75.0	0.9	4	100.0	1.2
X67	ISP by and exposure to other gases and vapours (e.g. carbon monoxide)	1	8.3	0.3	11	91.7	3.3	12	100.0	3.6
X68	ISP by and exposure to pesticides	14	32.6	4.2	29	67.4	8.8	43	100.0	13.0
X69	ISP by and exposure to other an unspecified chemicals and noxious substances	5	25.0	1.5	15	75.0	4.5	20	100.0	6.1
X70	ISH by hanging, strangulation, and suffocation	40	22.7	12.1	136	77.3	41.2	176	100.0	53.3
X71	ISH by drowning and submersion	1	16.7	0.3	5	83.3	1.5	6	100.0	1.8
X72	ISH by handgun discharge	0	0.0	0.0	3	100.0	0.9	3	100.0	0.9
X73	ISH by rifle, shotgun and larger firearm discharge	0	0.0	0.0	2	100.0	0.6	2	100.0	0.6
X76	ISH by smoke, fire and flames	1	14.3	0.3	6	85.7	1.8	7	100.0	2.1
X78	ISH by sharp object	2	20.0	0.6	8	80.0	2.4	10	100.0	3.0
X80	ISH by jumping from a high place	12	35.3	3.6	22	64.7	6.7	34	100.0	10.3
X81	ISH by jumping or lying before moving object	3	60.0	0.9	2	40.0	0.6	5	100.0	1.5
X84	ISH by unspecified means	0	0.0	0.0	1	100.0	0.3	1	100.0	0.3
	TOTAL	84	25.5	25.5	246	74.5	74.5	330	100.0	100.0

*A person can have multiple methods, hence total % exceeds 100%

With reference to Table 12, it was shown that both male and female had opted for hanging, strangulation and suffocation (X70) as the favoured method of suicide. Out of 84 female cases, 47.6% chose hanging to end their life while 136 males (55.7 %) also chose this method. Additionally, the study showed that both genders chose exposure to pesticides and jumping from a high place as their second and third chosen methods of suicide respectively. The trend shows similar choice of suicide methods as in previous years. These observations further confirmed the fact that choices of suicide methods were based on ease of access.

Suicide by exposure to other gases and vapour (eg: carbon monoxide) was favoured by males more than females. For suicide by X76 (smoke, fire and flames), the victims in Malaysia were mainly males whereas

in India, Sri Lanka and Iran, the majority were females (Ahmadi et al. 2008, Laloe Ganesan 2002, Kanchan 2009).

3.2.2 SUICIDE METHOD VS. ETHNICITY

Based on Table 13, the highest numbers of suicide was among the Chinese, followed by Indians and Malays. The most preferred method of suicide among these major ethnic groups was hanging. The second most preferred method among the Malays and Indians was X68 (exposure to pesticides), however, among the Chinese the second most preferred method of suicide was X80 (jumping from high place). The third common method of committing suicide among the Chinese was X68 (exposure to pesticides), for the Malays, it was X78 (sharp object), for the Indians X69 (exposure to other unspecified chemicals and noxious substances). In this study, suicide by firearm and suicide by jumping or lying before moving object were rare (1.5% in each category). In contrast, the former was the most common method in United States of America (Centers for Disease Control and Prevention 2009).

Majority of the 35 non-Malaysians and 11 Bumiputera from Sabah and Sarawak chose hanging as their preferred method of suicide. The analysis on the method of choice for committing suicide amongst ethnic groups may not reflect the actual situation due to possible error in data collection.

Table 5: Distribution of Choice of Suicide Methods verses Ethnicity

Suicide Methods	Chinese			Indian			Malay			BumiS/S'wak			Others (M)			Others (NM)			Total		
	N	Eth %	Met %	N	Eth %	Met %	N	Eth %	Met %	N	Eth %	Met %	N	Eth %	Met %	N	Eth %	Met %	N	Eth %	Met %
X60	0	0.0	0.0	3	100	0.9	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	3	100	0.9
X61	2	100	0.6	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	2	100	0.6
X63	1	100	0.3	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	1	100	0.3
X64	1	100	0.3	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	1	100	0.3
X66	2	50	0.6	1	25	0.3	0	0.0	0.0	0	0.0	0.0	1	25.0	0.3	0	0.0	0.0	4	100	1.2
X67	10	83.3	3.0	0	0.0	0.0	1	8.3	0.3	0	0.0	0.0	1	8.3	0.3	0	0.0	0.0	12	100	3.6
X68	13	30.2	3.9	19	44.2	5.8	6	14	1.8	3	7.0	0.9	1	2.3	0.3	1	2.3	0.3	43	100	13
X69	10	50.0	3.0	7	35	2.1	2	10	0.6	0	0.0	0.0	0	0.0	0.0	1	5.0	0.3	20	100	6.1
X70	73	41.5	22.1	37	21	11.2	27	15.3	8.2	6	3.4	1.8	9	5.1	2.7	24	13.6	7.3	176	100	53.3
X71	3	50	0.9	0	0.0	0.0	2	33.3	0.6	0	0.0	0.0	0	0.0	0.0	1	16.7	0.3	6	100	1.8
X72	0	0.0	0.0	1	33.3	0.3	1	33.3	0.3	0	0.0	0.0	0	0.0	0.0	1	33.3	0.3	3	100	0.9
X73	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	2	100	0.6	0	0.0	0.0	0	0.0	0.0	2	100	0.6
X76	5	71.4	1.5	2	28.6	0.6	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	7	100	2.1
X78	5	50	1.5	0	0.0	0.0	3	30	0.9	0	0.0	0.0	0	0.0	0.0	2	20	0.6	10	100	3.0
X80	28	82.4	8.5	1	2.9	0.3	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	5	14.7	1.5	34	100	10.3
X81	3	60	0.9	0	0.0	0.0	2	40	0.6	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	5	100	1.5
X84	1	100	0.3	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	1	100	0.3
TOTAL	157	47.6	47.6	71	21.5	21.5	44	13.3	13.3	11	3.3	3.3	12	3.6	3.6	35	10.6	10.6	330	100	100

*A person can have multiple methods, hence total % exceeds 100%

3.3 EXPRESSION OF INTENT – SPECIFY MODE

Table 6: Distribution of Expression of Intent of the Deceased

Items	N	%
Expression of Intent		
No	131	39.9
*Yes	110	33.5
Unknown / Missing	87	26.5
TOTAL	328	100.0
(Refer below for Mode of Expression of Intent)		
Mode of Expression of Intent		
Effort to learn about means of death	2	0.6
Preparation for death e.g. suicidal method preparation	16	4.9
Rehearsing fatal behaviour	10	3.0
Verbal expression of farewell or desire to die	58	17.7
Suicide note-written expression of farewell or desire to die	16	4.9
Communication with health professional	0	0.0
Combination		
Effort to learn about means of death and preparation for death	1	0.3
Effort to learn about means of death and verbal expression of farewell or desire to die	1	0.3
Preparation for death and verbal expression of farewell or desire to die	2	0.6
Rehearsing fatal behavior and verbal expression of farewell or desire to die	1	0.3
Verbal expression of farewell or desire to die and suicide note-written expression of farewell or desire to die	2	0.6
Verbal expression of farewell or desire to die and communication with health professional	1	0.3
Missing / unknown	218	66.5
TOTAL	328	100.0
Distribution of Expression of Intent		
Effort to learn about means of death	4	1.2
Preparation for death e.g. suicidal method preparation	19	5.8
Rehearsing fatal behaviour	11	3.4
Verbal expression of farewell or desire to die	65	19.8
Suicide note-written expression of farewell or desire to die	18	5.5
Communication with health professional	1	0.3
Missing / unknown	218	66.5
TOTAL	336	102.4

A person can have multiple modes, hence total % exceeds 100%

Among the total 328 suicide cases, 33.5% cases had expressed their intention to commit suicide. Out of the 110 victims who expressed their intention to commit suicide, 52.7% (n=58) expressed it verbally. The other more common modes of expression of intent to commit suicide include suicidal method preparation (14.5%, n=16), writing suicide notes (14.5%, n=16), rehearsing fatal behaviour (9.1%, n=10) and making efforts to learn about the means of death (1.8%, n=2). However, there are individuals who expressed multiple modes of intention to commit suicide.

CHAPTER 4: FACTORS ASSOCIATED WITH SUICIDE

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The risk factors for suicide include:
- 4.1 Previous suicide attempts
- 4.2 Family history of suicide or psychiatric illness
- 4.3 Substance abuse including alcohol
- 4.4 Physical illness
- 4.5 Life events prior to suicide
- 4.6 Mental illness and admission to psychiatric wards

4.1 PREVIOUS SUICIDE ATTEMPTS

Table 7: Distribution of Previous Attempts

Attempted Suicide Previously	N	%
No	191	58.2
Yes	52	15.9
Unknown / Missing	85	25.9
TOTAL	328	100.0

A retrospective study by Cosar et al in 1997 showed that 43.3% of the subjects had more than one previous suicide attempt. A Hong Kong study by Law et al. (2010) found that 59.6% of the victims had previous suicide attempts.

In our study of the 243 suicide victims, 21.4% (n=52) had history of previous suicide attempts. The result of this is similar with the psychological autopsy among the Indonesian population in Bali by Kurihara et al (2009) where they found that 20% of their suicide victims had previous suicidal attempts. According to Kurihara et al., this was their first successful psychological autopsy study carried out in a developing country's setting with a high participation rate for both suicide cases and controls, face-to-face direct interviews with key informants, consisting of close relatives instead of nonfamily members such as friends and visiting nurses.

In a suicide prevention study by Vijayakumar et al in Asia, it was found that a country's socio-economic, cultural, and religious characteristics can influence a person suicidal behavior and their families' acknowledgment of the behaviour.

4.2   FAMILY HISTORY OF SUICIDE OR PSYCHIATRIC ILLNESS

Table 8: Distribution of Family History

Family History of Suicide or Psychiatric Illness	N	%
No	211	65.1
Yes	23	7.1
Unknown / Missing	90	27.8
TOTAL	324	100.0

Attempted and completed suicides among first degree relatives of suicide victims have been well studied and documented (Cheng, 1995; Brent and Mann, 2005; Vijayakumar, 2008; Li et al, 2008, Sorensen HJ et al 2009, Nakagawa et al 2009). Qin et al (2002) noted that a family history of completed suicide and psychiatric illness significantly and independently increased suicide risk. Previous reports by Runeson et al (1996) showed that 38% of the suicide victims had a parent or sibling who attempted suicide and 5% of the victims had family history of completed suicide. Runeson and Asberg (2003) in their study among the Swedish population found 9.4% of suicide victims had a family history of suicides. Kurihara et al (2009) in their psychological autopsy study of risk factors for suicide found 16.7% of them had a positive family history of suicide.

The findings in our study showed 9.8% (n=23) of 234 suicide victims had a positive family history of suicide or psychiatric illness. This small percentage explained that the family members were not aware of the presence of any psychiatric illness in their family. Moreover, the sample size was much smaller compared with other psychological autopsy studies.

4.3   SUBSTANCE ABUSE INCLUDING ALCOHOL

Table 9: Distribution of History of Substance Abuse

History of Substances Abuse	N	%
No	151	46.0
* Yes	83	28.7
Unknown / Missing	94	25.3
TOTAL	328	100

Our findings showed that 35.5% of our victims had history of substance abuse which included alcohol, stimulants, opiates, cannabis, sedatives and inhalants. Because information was obtained from informants who may not be aware of the full history of abuse in the victims, we were unable to differentiate social use, abuse and dependance of alcohol. However, the 'use of illicit substances' other than alcohol can be considered at least to the level of abuse in this study.

Distribution of History of Substance Abuse	N	%
X71 Cocaine and crack	1	0.3
X72 Sedative of sleeping pills (valium, dormicum)	4	1.2
X73 Hallucinogens (LSD)	2	0.6
X74 Alcoholic beverages (beer, samsu)	62	18.9
X75 Stimulants/ Amphetamine	6	1.8
X76 Heroin, Morphine, Methadone or Pain Medication (codein, tramado)	10	3.0
X77 Marijuana (cannabis, hash)	6	1.8
X78 Inhalants (glue, paint thinner)	8	2.4
Missing	247	75.3
TOTAL	346	105.5

The same person can have multiple substance abuse and hence total % exceed more than 100% in the table above

4.3.1 *Alcohol*

In this study, the most common substance of abuse was alcohol (62.6%). Alcohol use is frequently studied in association with suicide. In previous meta-analysis studies, the lifetime risk of suicide was found to be 7% for alcohol dependence (Inskip et al 1998). In the Northern Ireland suicide study, which was a case-control psychological autopsy, the estimated risk of suicide in the present of current alcohol misuse or dependence was eight times greater than its absence (Foster et al 1999).

Kendall (1983) concluded that there were multiple factors, which were associated with alcohol leading to a higher risk of suicide. Among them were marital break ups, loss of job and social isolation and loss of self esteem which may propel them towards depression. Furthermore, alcohol intoxication could also lead to increased impulsivity and weakening of normal restraints against dangerous behavior.

4.3.2 *Other substances*

Besides alcohol, opiates (10.1%), inhalants (8.1%), stimulants (7.1%) and marijuana (6.1%) were the other commonly used substance among our study subjects.

Many studies related opiate use to suicide. Louisa Degenhardt et al (2010) concluded that mortality rate and risk of death are higher among the heroin dependants compared with the general population.

4.4   PHYSICAL ILLNESS

Table 11: Distribution of Physical Illness

Physical Health Problems	N	%
No	179	54.6
*Yes	70	21.3
Unknown / Missing	79	24.1
TOTAL	328	100.0

Our study showed 28.1% (n=70) of 249 suicide victims had history of physical illness. Of these, 11.4% (n=8) had been diagnosed with cancer, 12.9% (n=9) with asthma and 14.3% (n=10) with

hypertension. Vijayakumar (2008) in their review on suicide in Asia showed that 23% of suicide victims in India suffered from physical illness. Kurihara et al (2009) found 23.3% (n=4) of their suicide victims had serious physical illness.

4.5   LIFE EVENTS PRIOR TO SUICIDE

Table 12: Distribution of Life Events

Life Events of the Deceased	N	%
No	75	22.9
*Yes	135	41.2
Unknown	118	36.0
TOTAL	328	100.0

In this study, the predominant preceding life events were financial problems and difficulties with intimate partner. Our findings were found to be similar with findings in a psychological autopsy study by Toshiyuki et al which found that suicide cases were noted to have more negative life events such as severe interpersonal and financial problems.

Our present findings showed 64.3 % (n=135) of 210 suicide victims had significant life events prior to suicide. Interestingly, the three prominent life events which were noted were similar with our previous study. The negative life events in our study population were financial crisis, intimate partner problems and employment problems. The economic crisis may have resulted in an increase in dealing with illegal money lenders (locally known as 'Ah Long'). These illegal money lenders take advantage of people desperate for financial assistance by offering unsecured loans with high interest rates to individuals. Number of suicide deaths related to this illegal money lending had made headlines in the local media.

4.6   MENTAL ILLNESS AND ADMISSION TO PSYCHIATRIC WARDS

Table 13: Distribution of History of Mental Illness

History of Mental Problems	N	%
No	179	54.6
*Yes	72	22.0
Unknown / Missing	77	23.5
TOTAL	328	100.0

Studies have shown higher incidence of mental illness among suicide victims. Kurihara reported as high as 80% had at least one current diagnosis of Axis 1 of DSM IV psychiatric disorder. Other retrospective psychological autopsy studies found that 60-90% of the suicide cases had history of psychiatric illness prior to their deaths. (Law et al. 2010, Cavanagh et al. 2003, Chen et al. 2006, Cheng et al. 2000, Phillips et al. 2002).

Using DSM-IV criteria, Yang et al (2005) found 62.9% (n=563) of the 895 of their suicide victims in China had mental illness at the time of suicide. Affective disorders were present in 33.24% (n=117) of all suicide victims.

Our findings showed 28.7% (n=72) of 251 suicide victims had history of mental illness. The most common was depression (47.2%) followed by Schizophrenia (26.4%). This result was similar to our previous study.

Studies have shown that the risk of suicide was higher among those with history of psychiatric admissions (Qin et al 2003). Qin and Nordentoft 2005 in another study found 37% of males and 56.9% of females who committed suicide had a history of admission to psychiatric hospitals. Our findings revealed 12.6% (n=32) of 253 suicide victims had history of psychiatric admissions to the wards.

CHAPTER 5: CONSIDERATIONS FOR FUTURE STUDIES AND SERVICES

Dr Nor Hayati Ali

LIMITATIONS

Omission of **notification** is a real issue not only for this registry but also for registries of other forms of non-natural deaths. This is partly because about 45% of deaths in Malaysia are "non-certified"(Department of Statistics Malaysia, 2010), meaning that the cause of death/ burial permit is issued by lay certifiers. Although the law dictates that all cases of "sudden death" (non-natural) must be fully investigated - which includes an examination by a registered medical practitioner - this discretion lies largely on the attending police officer. Furthermore, suicidal deaths are culturally sensitive and had shown to be systematically under-recorded (Morrel, 2009).

Cases might also be missed at the hospital level. At highest risk of omission are those who died due to the sequelae of the suicidal act in the wards. For example, the causes of death were documented as "respiratory failure" or "septicaemia" without mentioning the external cause of that condition – i.e. intentional paraquat ingestion or intentional self-harm using flames. This can only be overcome if medical officers are familiar with the two-tier diagnostic coding system advocated by the ICD-10. Apart from that, performance of individual states may vary due to the strength of forensic services –manpower and infrastructure - that is available there. However, the NSRM is looking at ways on how to support and facilitate data collection for those hospitals.

The NSRM only register cases that have a preponderance of evidence for the presence of intent; and excluding equivocal cases (those with undetermined intent). This should not be misconstrued as cases being "misclassified". The issue of undetermined manner of death can be very real, and our enthusiasm to gather data on suicides should not lead us to registering false positive cases.

Another limitation is omission of data or 'missing data'. Data for this registry is collected in a naturalistic manner; specifically when relatives came to collect the remains of the deceased at the respective forensic units or departments. It might not be the ideal time for information gathering; and the relatives that turned up may not be the closest to the deceased. This had resulted in missing data especially in the section pertaining to life events, past illnesses and substance use; where most respondents reported "don't know". The option is to limit data collection to demographics and death history only. In-depth investigation on risk factors of suicide would require a separate research group that meets the closest next-of-kin at a later date. This is supported by studies of families' reaction to interviews after a suicide; which showed that they preferred to have it 8 – 12 weeks after the death (Hawton, Houston, Malmberg, & Simkin, 2003).

Having an on-line registration system had greatly helped data recording – the system will prompt user if they had left out any of the compulsory data. Standardised synoptic coding systems also enable quick entry and retrieval of relevant information. However, the CRF consists of 4 electronic pages. With the limited hardware and internet connectivity, SDPs do face difficulties in downloading or submitting each page.

RECOMMENDATIONS

After three years of operations, the NSRM may need to consider some modification to its Case Report Form (CRF). It needs to seriously consider the practicality of having detailed questions to which the informants usually responded with "don't know". Meanwhile there are important data that should not be hidden within categories, e.g. the place of death and written methods of expression of intent. For the former, NSRM had used the format proposed by the ICD-10, coding locations such as prisons and police lock-ups as "public buildings" or "residential building"(World Health Organization, 2007). This resulted in loss of data on suicide in custodial settings. Meanwhile, for the expression of intent, more victims are resorting to IT-savvy methods of announcing the intent i.e. using text and social network messages, rather than the traditional pen and paper. This would represent a new angle to suicide prevention strategies – the CRF need to be enhanced to capture these data.

Other modifications that may be useful is to have the CRF in both English and Malay languages, because majority of the paramedical staff are more proficient in Malay than in English. Another necessary enhancement would be adding the code X87.0 for cases that died due to the complications of suicidal act several days later, which is useful in calculations of costs.

There is a need for a concerted effort in standardising death documentation in Malaysia. With the advent of information technology now, there is surely a way to make ICD-10 more accessible and user-friendly to medical practitioners and record officers. Regular training and updates should be given to all relevant parties so that the cause of death can be documented accurately.

The NSRM is fully aware that its data is acquired 'by proxy' – because the index person had already died. However, health professionals need to be aware that suicidal behaviour has a wide spectrum: i.e. ideations, plans and attempts. Instead of lamenting on the lack of data from this registry, we encourage researchers who are interested in suicidology to complement our efforts with their own research using 'living' respondents i.e. those with suicidal ideations and non-fatal intentional self-harm. Data merging of those research endeavours with the NSRM will be able to illustrate the profile of patients who will ultimately die of suicide and give important clues for developing suicide prevention plans.

Another strategy to identify an underlying mental or physical illness among suicide victims is by doing data-merging with other registries e.g. schizophrenia or the cancer registries. The National Institutes of Health via the Clinical Epidemiology Unit of CRC may be able to preside on these data processing systems with the assistance of the ministry's Information Technology Division for data security measures.

From a human resource angle, it is hoped that the staffing in forensics and mental health services can be increased. If clinical staff is not available, administrators may consider other forms of staffing e.g. the Science Officer or Information Technology Officer –they can also contribute towards more efficient data collection. Apart from that, there may be a need for liaison mental health staff to provide bereavement services to families of the deceased.

Prevention-wise, the NSRM had shown increasing numbers of suicide victims with psychiatric illness. Thus, it is important for policy-makers to emphasise early detection and treatment of mental illnesses and problems of substance use disorders with regards to suicide prevention strategies. Systems-wise, the NSRM need to carry out feedback and system modification continuously to ensure that data quality can be maximised. This effort will need regular funding and support from the authorities.

CONCLUSION

In conclusion, we believe that the NSRM can provide a platform to educate and alert healthcare workers about death documentation and management of dead bodies. There are ubiquitous challenges in public hospitals such as inadequate manpower and limited space to carry out interviews: but a competent and caring healthcare team can really make a difference for the relatives of the deceased.

Nevertheless, completed suicides are the least common component of suicidal behaviour. There are other forms of behaviour i.e. suicidal ideations, plans and non-fatal attempts that warrant more in-depth investigations to holistically illustrate the magnitude of this phenomenon in Malaysia. The NSRM certainly hopes that other researchers in suicidology can come up with other projects to explore suicidal behaviour in Malaysia and create data linkages to identify those who will most likely die by suicide.

The WHO had outlined that the effective usage of registries includes: establishing records, following up cases, and providing data on frequency and trends. Even in the absence of a defined population base, useful information may be obtained from registers on the natural course of disease (World Health Organization, 1967). Thus, the NSRM hopes to gradually contribute to a strong death database, specifically for suicide.

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