COUNTRY REPORT

SUICIDE TREND IN SINGAPORE FROM 2005 TO 2009

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Abstract

Objectives: **Suicide is one of the top contributors to the mortality rate in Singapore. We study the suicide rate from 2005 to 2009 and comment on possible contributors towards the suicide rate.** *Methods:* **Data used in this paper was obtained from the Ministry of Health, Ministry of Manpower, Statistics Singapore and Samaritans of Singapore websites.** *Results:* **Overall, the suicide rate has been fairly stable ranging from 9.99 to 11.88 per 100,000 residents in Singapore. Suicide rates were highest in men in the age groups more than 65 years and 20-29 years. Although there is an increase in suicide rate from 2008 to 2009, the overall trend in the last 5 years appears to be fairly stable. The suicide rate among women appears to be low and stable, if not on the decline. The elderly (older than 65 years old), especially men, remain at the highest risk of suicide.** *Conclusion*: **Suicide rate in Singapore has remained fairly stable ranging from 9.99 to 11.88 per 100,000 residents. Among men in the 20-29 age group there was an increase in suicide rate that certainly warrants further investigation. Increasing suicide prevention efforts in Singapore may help reduce the loss of productive members of our society.** *ASEAN Journal of Psychiatry, Vol.12(2), July - Dec 2011: XX XX.*

Keywords: Suicides; Suicide trends; Singapore

Introduction

The subject of suicide is difficult to study due to varying definitions from country to country as well as from different fields of study such as in legal and medical or psychiatric terms [1]. Suicide is defined by the World Health Organisation as "an act deliberately initiated and performed by a person in the full knowledge or expectation of its fatal outcome" [2]. Deaths by suicide are often very tragic and disturbing events especially when it involves people who could otherwise be well and productive members of society. Suicides affect those surrounding the victim in the form of bereavement with an average of 5 people bereaved by 1 suicide death [3]. The fact that one of the earliest works that defined the field of sociology was on the topic of suicide indicates the significance of suicide deaths and its impact on society [4]. According to statistics by the World Health Organisation, the global burden of disease due to suicide in 1998 was 1.8% and is expected to increase to 2.4% by the year 2020 [5]. The rate of suicide deaths is sometimes also used as an indicator of social cohesion in a culture or civilisation hence monitoring of a nation's suicide rate can provide a glimpse into the stability of its social structure [6]. From a psychiatric point of view the majority of suicide victims had a psychiatric disorder at the time of death with up to 98% of victims were diagnosed with a psychiatric illness [5].

Although the suicide rate in Singapore is relatively low compared to other Asian countries such as Japan, Taiwan, Hong Kong and China, suicides are one of the leading causes of death in Singapore based on statistics released by the Ministry of Health and Statistics Singapore, deaths by suicide constituted 2.2% of all deaths in 2007 and

2.1% of all deaths in 2008 which placed death by suicide as the 9th leading cause of death in 2007 and the 8th leading cause of death in 2008 [7-9]. Past papers on suicide deaths in Singapore found that suicides were highest among young adults and the elderly; especially those who were elderly and of Chinese ethnicity [10-14]. In terms of gender, males are more likely to commit suicide than females in Singapore which is also the trend internationally [15]. There is also a suggestion that economic indicators are also influential in the rate of suicide in Singapore with the unemployed being at higher risk than the employed [14]. Unlike seasonal countries where there have been associations made between suicide rates with the month of the year, in Singapore there appears to be no such link [16]. Furthermore, contrary to international data on psychiatric disorders in suicide victims, with reports of up to 98% of suicide victims had psychiatric disorder. In Singapore, there appears to be a lower prevalence of psychiatric illness in suicide victims as reported by M Loh et al in 2007 with only 47 (17.2%) in 2001 and 74 (20.2%) in 2002 of suicide victims had a psychiatric diagnosis and in 1980 the prevalence was 25.7% as reported by E. H. Kua and W. F. Tsoi (1985) [13]. In this paper we hope to elucidate the suicide trend in Singapore over the last 5 years and comment on possible contributors to the trend in suicide rates.

Methods

Data used in this paper was obtained from the Ministry of Health (www.moh.gov.sg), Ministry of Manpower (www.mom.gov.sg), Statistics Singapore (www.singstat.gov.sg) and Samaritans of Singapore (www.samaritans.org.sg) websites. The data is freely available to the public over the internet through the websites mentioned. Past papers on suicide trends in Singapore were obtained by searching on Ovid and PubMed databases using the terms: Suicide, Suicide rate, Suicide rate Singapore, Suicide Singapore. An internet search for articles on suicide in general as well as suicide in Singapore was also performed with the internet search engine Google using the search terms: Suicide, Suicide rate, Suicide rate Singapore, Suicide Singapore. Suicide rates were calculated by total number of suicides by residents in a year divided by the

mid year resident population and multiplied by 100 000 to derive the suicide rate per 100 000 residents in Singapore.

Results

Table 1 shows the raw data and calculations based on the data from 2005 to 2009. The data in Table 1 is further divided to male and female total suicides and suicide rates. On examination of the total number of suicides and total suicide rate per 100 000 residents across 2005 to 2009, there did not appear to be any clear trend. There was a peak in the suicide rate in 2006 of 11.9 followed by a downtrend up to the year 2008 of 10.0 before increasing again in 2009 to 10.7. There appeared to be some moderate variation in the suicide rate as it ranged from 10 to 11.9. When examined from a gender based perspective there was an increasing suicide rate in the male suicide rate from 2007 (12.1) to 2009 (14.5). The female suicide rate has been relatively stable with minor variations from year to year. The suicide rate ranged from 7.1 to 8.9 for the female population. The ratio of male to female suicides was lowest at 1.3 in 2007 and was on an uptrend to 2.0 in 2009. The low change in ratio was mostly contributed by the changes in the total number of male suicides for those years as the female suicide deaths were fairly stable. Year 2007 saw a sharp decline in total male suicides being the lowest number (215) of the 5 years examined while 2009 showed the highest number of male suicides (267) of the 5 years examined. The large ratio of male: female suicides in 2009 were also contributed by the low number of female suicides (134).

Table 2 shows the breakdown of suicide data by year, age group, sex and includes gross domestic product (GDP), per capita GDP and resident unemployment rate of the corresponding year for comparison of macroeconomic status and its influence on suicide rates. Based on the suicide rates as stratified by age and sex, the group with the highest suicide rate would be in the elderly males who were 65 and older. Their suicide rate was 3-4 times that of the overall suicide rate of the country. In 2005 the suicide rate for this group was 44.6 compared to the national rate of 11.7. The rate decreased to 28.7 compared to the national rate of 10.7 in 2009 however that was still more than double the

national rate. Males in the age groups 40-49 and 30-39 had fairly high suicide rates in 2005 and 2006, however their suicide rates had since lowered and is now comparable to the national rate although still slightly higher. However, males in the age group 20-29 had an increased suicide rate in the last year almost doubling from 10.8 in 2008 to 20.1 in 2009. By comparison, the suicide rate for most female age groups was generally declining with the most dramatic drop in suicide rate in the 60-64 age groups from 14.1 in 2008 to 5.8 in 2009. The highest suicide rate for females was also in the group 65 and above as it was in the males.

Table 1 Raw data and calculated suicide rates and ratios

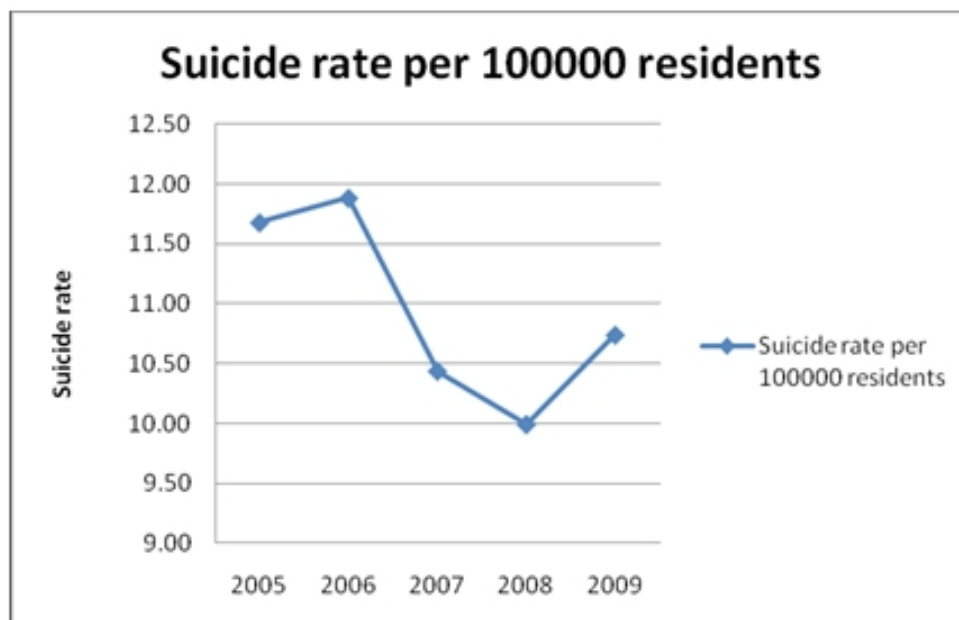| Year	2005	2006	2007	2008	2009
Total suicide	405	419	374	364	401
Total male suicide	263	260	215	232	267
Total female suicide	142	159	159	132	134
Total Population ('000)	4,265.80	4,401.40	4,588.60	4,839.40	4,987.60
Resident population ('000)	3,467.80	3,525.90	3,583.10	3,642.70	3,733.90
Resident male ('000)	1,721.1	1,748.2	1,775.5	1,803.0	1,844.7
Resident female ('000)	1,746.70	1,777.70	1,807.60	1,839.70	1,889.10
Suicide rate /100 000 (residents only)	11.7	11.9	10.4	10.0	10.7
Male suicide rate	15.3	14.9	12.1	12.9	14.5
Female suicide rate	8.1	8.9	8.8	7.2	7.1
Male: female ratio	1.9	1.6	1.3	1.8	2.0

Figure 1 Suicide rate per 100 000 residents from 2005 to 2009

Table 2 Suicide data by age group/sex and economic data from 2005 to 2009

Sucide rate (per 100,000)	Year				
Age and sex <20	*2005*	*2006*	*2007*	*2008*	*2009*
Male	1.5	1.9	1.5	1.7	2.1
Female	1.3	0.2	1.5	0.9	2.0
20-29					
Male	15.7	13.0	15.9	10.8	20.2
Female	11.4	10.4	10.4	10.5	8.0
30-39					
Male	17.7	18.1	12.5	12.8	16.8
Female	9.2	8.9	9.1	6.8	5.1
40-49					
Male	18.9	20.3	12.8	17.5	16.3
Female	8.7	10.5	9.5	6.7	5.7
50-59					
Male	17.6	21.1	17.5	17.3	17.4
Female	11.1	13.7	6.4	10.9	11.2
60-64					
Male	22.7	31.0	10.5	15.9	17.9
Female	11.6	10.0	13.1	14.1	5.8
65 and above					
Male	44.6	26..9	31.9	34.4	28.7
Female	14.1	20.7	25.8	11.9	19.0
Economic data					
GDP	208,763.7	230,509.2	266,405.1	273,537.2	265,057.9
Per capita GDP	48,939	52,466	58,243	55,369	53,464
Resident unemployment rate	4.1	3.6	3	3.2	4.3

In comparing the macroeconomic data available and the annual suicide rates from 2005 to 2009 there seems to be some correlation between changes in the levels of unemployment and GDP with the suicide rate. From the year 2006 to 2009, it is observed that low unemployment levels corresponded with relatively lower suicide rates. Similarly a rising GDP from 2006 to 2007 corresponded with a drop in suicide rates. A slight drop in GDP from 2008 to 2009 corresponded with a rather large rise in suicide rate. However, in 2005 to 2006, despite a large increase in GDP and decrease in unemployment there was an increase in suicide rates which would be contrary to expectations. GDP is a number that indicates the overall economic health of the country. Per capita GDP is a measure that results from GDP divided by the size of the nation's overall population. So in essence, it is theoretically the amount of money that each individual gets in that particular country. The GDP per capita provides a better determination of living standards as compared to GDP alone. With that in mind, we sought to examine the relationships between per capita GDP and unemployment and suicide rates. A correlation analysis revealed that there were no significant correlations between per capita GDP and unemployment rate [$r(5) = -0.77$, $p = 0.13$], as well as between per capita GDP and suicide rate [$r(5) = -.076$, $p = 0.14$].

We examined how the impact of per capita GDP differed in influencing the suicide rate of males and female. In particular, we were interested to explore the plausibility of a significant inverse relationship between male suicide rate and per capita GDP that would not be present for females. Male suicide rate and per capita GDP were indeed found to be negatively correlated [$r(5) = -0.94$, $p = 0.02$].

There was no correlation between female suicide rate and per capita GDP [$r(5) = 0.06$, $p = 0.93$].
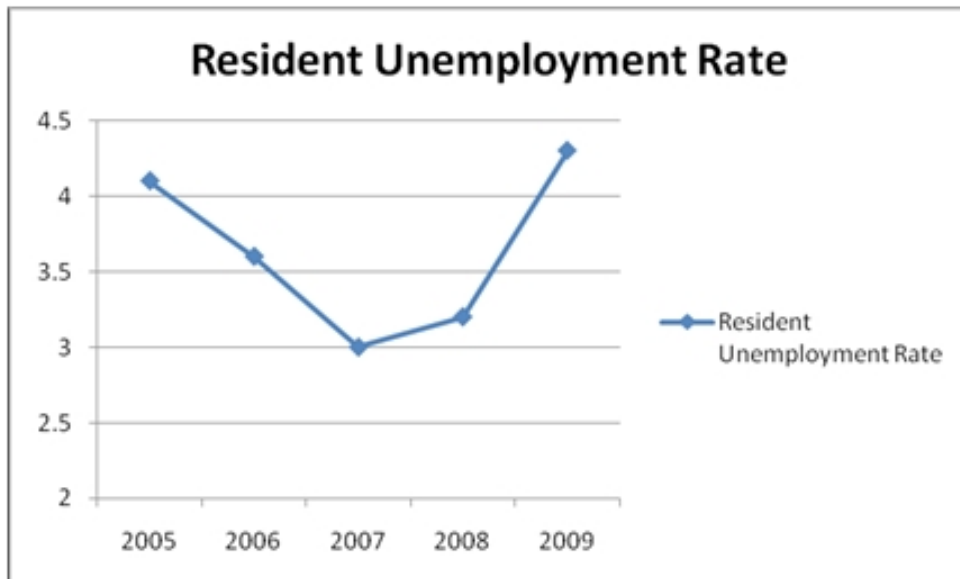

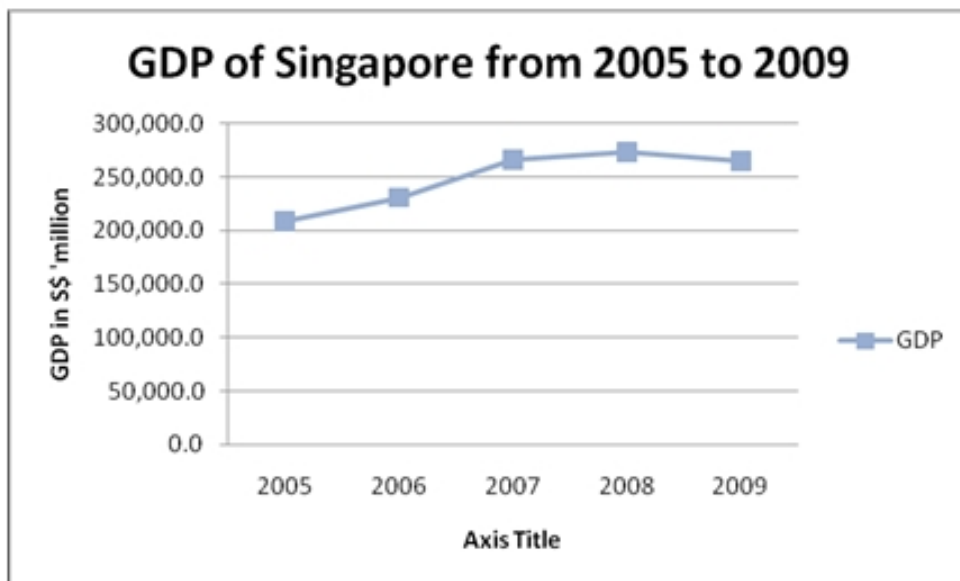**Figure 2 Resident unemployment rate from 2005 to 2009**

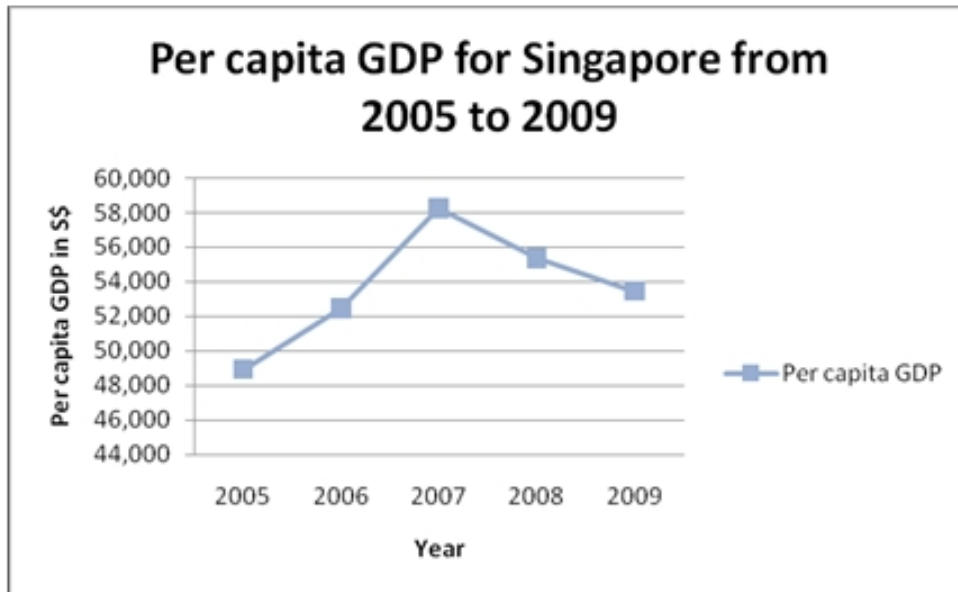**Figure 3 Singapore's gross domestic product from 2005 to 2009**

Figure 4 Singapore's per capita GDP from 2005 to 2009

According to data from the SOS, the number of callers to their helpline decreased from 2008 to 2009; the latest annual data shows the lowest total number of calls in the last 5 years. The total number of callers classified as high suicide risk fell from 233 to 202 from the period April 2008 - March 2009 compared to the period April 2009 - March 2010. Calls concerning debts increased from 2454 to 2673 while loan shark related calls remained similar at 217 to 218 and gambling related calls increased slightly from 123 to 132 for the same period.

Discussion

As was seen in previous studies on suicide in Singapore as well as internationally, suicide rates are highest among males in Singapore over the last 5 years. In terms of age, the suicide rates were the highest in the elderly population in Singapore which also corresponds to previously seen data [11]. Suicidal deaths among the elderly continue to be a problem in Singapore as can be seen in the data presented and with the aging population, one can only expect the problem to continue to persist. Further studies into the causes and circumstances leading to the high suicide rate among the elderly may help strategizing future public health policy in preventing suicide deaths within this population.

The sudden increase in suicide rate of males aged 20-29 is a worrying trend. This could just be a statistical aberration in view of the relatively lower suicide rates in the past for this age group. Further monitoring of this age group would certainly be warranted. One possible explanation of the increased suicide rate could be that of the poorer economic climate over the last 2 years. However, without detailed information of the social circumstances of each individual case we can only speculate as to the cause. Rapidly changing socioeconomic and cultural circumstances have previously been suggested as contributors to increased suicide rates. Thus it is possible that the sudden change in economic climate could have caused the increase in suicides in this group of young males [17].

Statistical analysis in our study has showed a negative correlation between per capita GDP and male suicide rates. This suggests that males were more affected by the economic climate than women. This is not surprising as in our Asian culture, males are typically seen as the provider for the family. Males, would therefore, understandably be under greater duress and stress in poorer economic climate and be more affected by the state of the economy than females. With this data in mind, we need to be more alert to diagnose depression and whenever possible, assess the

suicide risk in males, more so during times of economic hardship.

On a more positive note, the suicide rates for females showed a decline across almost all the age groups. If suicide rates were to be considered as an indicator of social cohesion, perhaps this is a reflection of Singapore as a more progressive society with women being able to further advance their social standing and gain access to more opportunities. Examining the progress made in reducing suicide rates in this population may assist in planning for interventions in higher risk populations. It would also have been informative to examine the prevalence of psychiatric disorders in the suicide victims of Singapore especially given the differences in the prevalence reported internationally and that which has been reported in Singapore. Our data was obtained from Statistics Singapore, which unfortunately did not provide an ethnic distribution of suicide rates. Further subdividing the suicide data among different religious and racial groups may have yielded additional information on protective and risk factors in the Singaporean population, and perhaps allowed mental health professionals to be more aware of at rsk groups, if any. Further studies are needed to look into this area.

Conclusion

Although there is an increase in suicide rate from 2008 to 2009, the overall trend in the last 5 years appears to be fairly stable. The suicide rate among women appears to be low and stable, if not on the decline. Among men in the 20-29 age group there is an increase in suicide rate that certainly warrants further investigation with the possibility that the change in economic circumstances contributing to the increase. Men have been shown to be more vunerable to economic downturn compared to women. The elderly (older than 65 years old, especially men) remain at the highest risk of suicide and one wonders if changing cultural and economic circumstances are again at play in increasing suicide rates.

Despite having one of the lowest suicide rates in the region, suicide in Singapore is still one of the top causes of death. Therefore, suicide prevention certainly deserves further efforts within the country especially when one of the highest rates is within the age group that has significant socioeconomic contributions to the country.

References

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