IC-008

Patterns of Suicide Mortality in Southern Thailand: Insights from 2019 Verbal Autopsy Data

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ABSTRACT

Suicide deaths is a global issue which resulted from mental health problem. Understanding the pattern of deaths is benefit for setting up prevention strategies and allocate the proper resources. This study aimed to investigate pattern of suicide death by demographic and place of death in southern of Thailand. VA data in 2019 were obtained from the International Health Policy Program (IHPP), Ministry of Public Health, Thailand. Deaths less than ten years were excluded. A logistic regression was used to find the patterns of suicide death by demographic factor and place. This study results were found that suicide deaths increased with age, except for individuals aged 60 years and older. Specifically, suicide deaths among those aged 50-59 years were significantly higher than the overall average. The deaths were reported in the vital registration database significantly aligned with those verified by the verbal autopsy method. In conclusion, the study confirmed the reliability of the verbal autopsy method in accurately verifying suicide deaths, as shown by its alignment with data from the vital registration database. These findings highlighted the need to concentrate suicide prevention efforts on middle-aged populations in southern Thailand while continuing to refine and employ effective methods for verifying mortality.

Keywords: Suicide Mortality, Verbal Autopsy, Southern Thailand, Vital Registration

Introduction

Suicide is a significant public health issue globally. The World Health Organization (WHO) estimates that around 700,000 people die by suicide each year, making it one of the leading global causes of death (Fleischmann et al., 2021). Suicide rates differ significantly across various regions, countries, and demographic groups, influenced by a range of socio-economic, cultural, societal, substance use, psychological, and environmental factors (Lari & Sefiddashti, 2023; Milner et al., 2012; Stack, 2021). Suicide rates tend to rise with age, peaking among individuals aged 70 and older. Additionally, suicide remains a leading cause of death among young adults (Case & Deaton, 2015; McKeown et al., 2006). Men are at a greater risk of suicide compared to women, often opting for more lethal methods, which underscores this gender disparity (Canetto & Sakinofsky, 1998; Kanchan et al., 2009; Möller-Leimkühler, 2003).

Southern Thailand's multicultural environment complicates public health issues like suicide due to its diverse population, including Malay-Muslim, Thai Buddhists, and other ethnic groups (Joll, 2015). These cultural differences influence perceptions and responses to mental health issues, affecting the approach to mental health risks within communities (Choudhry et al., 2016). Suicide is a critical concern in this region that has not been extensively researched. Understanding the patterns and risk factors associated with suicide is essential for developing effective prevention strategies. Traditional data collection methods, such as death certificates and vital registration systems, may not always provide an accurate representation due to issues like misclassification or incomplete reporting (AbouZahr et al., 2012; Mahapatra et al., 2007). Verbal autopsy (VA) has become an important tool for determining causes of death, particularly in regions where vital registration is limited or unreliable. This study aims to examine the patterns of suicide deaths in Southern Thailand using verbal autopsy data collected in 2019.

Purposes

1) To examine the patterns of suicide deaths in Southern Thailand using verbal autopsy data collected in 2019

Research Methodology

For this study, data on VA mortality in southern Thailand that were gathered in the provinces of Surat Thani and Songkhla in 2019 were chosen. These VA data were obtained from the International Health Policy Program (IHPP), Ministry of Public Health. Deaths occurring in individuals under the age of ten were not included in this study. A total of 1,092 deaths were included for further analysis. The variables in the VA data include age group, gender, province, suicide mortality based on reported VR, and suicide mortality verified through the VA method. The gender variable is coded as male and female. Age was divided into five categories: 10-29, 30-39, 40-49, 50-59, and 60 or older. The causes of death listed in the VR were classified into two categories: suicide and other. The causes of death, as classified by the International Statistical Classification of Diseases and Related Health Problems (ICD-10), were organized into 19 groups.

The cross-tabulation of causes of death specified in the Vital Statistics (VA) and Vital Records (VR) is illustrated using a bubble plot. Logistic regression was conducted to identify patterns in suicide mortality based on gender, age group, and VR cause group. The findings from the logistic regression analysis are displayed using a 95% confidence interval plot. Statistical analyses and graphs were performed using R programming (R Core Team, 2025).

Results

The results from the cross-tabulation of causes of death in VR and VA are presented in Figure 1. In VR, there were 20 reported suicide deaths, while the VA recorded 21 suicide deaths. Sixteen deaths showed correspondence between VR and VA, accounting for 76% (16 out of 21).

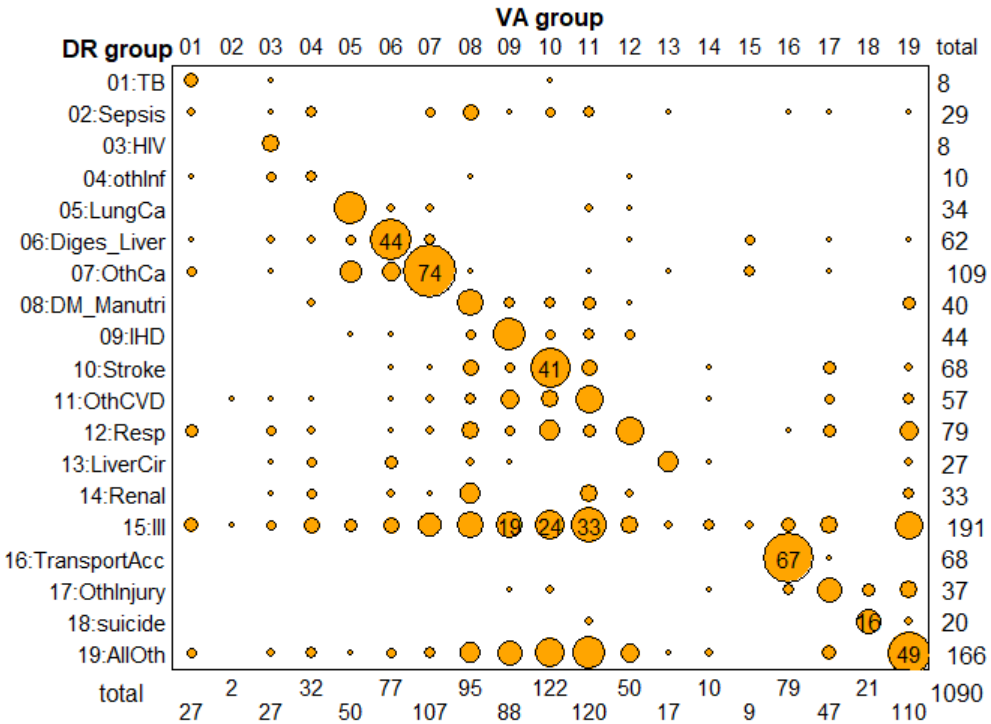

Figure 1 Crosstabulation of cause of death in VR and VA

The percentage of suicide deaths is shown in Figure 2. Among all deaths, suicide deaths accounted for 1.8% in Surat Thani and 2.0% in Songkhla provinces. For males and females, suicide deaths comprised 2.7% and 0.9% of total deaths, respectively. The age group with the highest percentage of suicide deaths was 30-39 years, at 6.6%, followed by the 40-49 age group at 3.4%, the 50-59 age group at 2.6%, and the 10-29 age group at 2.4%.

Figure 2 The percentage of suicide deaths by province, gender, age group and VR cause group

Results from Table 1 indicated a significant association between suicide deaths and factors such as gender, age group, and VR cause group. Among the recorded suicide deaths in VA, 81% were males. Additionally, there was an equal percentage of deaths (23.8%) in the age groups of 30-39, 40-49, and 60 and older. The correspondence rate of deaths between VA and VR was 76.2%.

Table 1: The distribution of suicide deaths in each gender, age group, province and VR cause group.

Variable	Suicide death in VA		P value
	Yes (%) n = 21	No (%) n = 1,069	
Gender			0.025
Male	17 (81.0)	603 (56.4)	
Female	4 (19.0)	466 (43.6)	
Age group (years)			0.003
10-29	2 (9.5)	80 (7.5)	
30-39	5 (23.8)	71 (6.6)	
40-49	5 (23.8)	140 (13.1)	
50-59	4 (19.0)	148 (13.8)	
60+	5 (23.8)	630 (58.9)	
Province			0.817
Surat Thani	8 (38.1)	434 (40.6)	
Songkhla	13 (61.9)	635 (59.4)	
Reported cause of death in VR			< 0.001
Suicide	16 (76.2)	4 (0.4)	
Other cause	5 (23.8)	1065 (99.6)	

The results from the logistic regression model are shown in Figure 3 with a logarithmic scale on the Y-axis. The horizontal line illustrates the overall percentage, which comprised 1.9% of total deaths. The percentage of deaths by suicide generally increased with age, except for individuals aged 60 years and older. The rate of suicide deaths among individuals aged 50 to 59 years was significantly higher than the overall average.

Additionally, the deaths confirmed through the verbal autopsy method closely matched those recorded in the vital registration database.

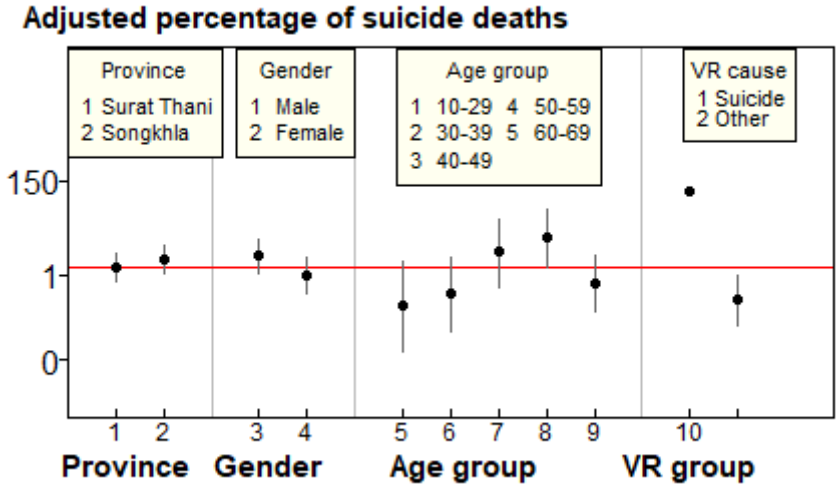

Figure 3 The percentage of suicide deaths by province, gender, age group, and VR cause group

Discussion

In southern Thailand, suicide deaths accounted for 1.9% of total deaths. The rate of suicide deaths generally increased with age, except for those over 60. Individuals aged 50-59 had a higher rate compared to the average. Deaths recorded in the vital registration database closely matched those confirmed through the verbal autopsy method.

Our study found that suicide deaths in southern Thailand comprised 1.9% of total deaths, which is significantly higher than the global suicide death rates of 1.3% in 2019 (Fleischmann et al., 2021) and 1.1% in 2021 (WHO, 2024), according to the World Health Organization. This difference indicates that suicide mortality may represent a more serious public health concern in this region compared to the global average, underscoring the necessity for targeted interventions.

The percentage of suicide deaths in Southern Thailand was observed to increase with age, except for individuals aged 60 years and older. However, individuals aged 50-59 years were found to have a significantly higher suicide rate than the overall average. Our finding is consistent with several studies (Garnett & Curtin, 2023, 2024), which found suicide deaths increase with age. However, the drop in the age group 60 and older in our study might be due to the effect of a small sample size of suicide deaths. A larger sample size might make the results more stable and reliable, which needs to be confirmed by further studies.

The reported suicide deaths in VR in Southern Thailand correspond with suicide death data obtained through the VA. This suggests that while social stigma may influence suicide reporting, it does not substantially affect the overall findings, as the data from both the vital registration and verbal autopsy methods are in strong agreement.

A notable limitation of our study is no data on psychological, substance use, social, and cultural factors in the verbal autopsy (VA) data. These factors are crucial for understanding the multifaceted nature of suicide. The lack of such data may result in an incomplete picture of the factors contributing to suicide deaths in southern Thailand. Future studies should aim to incorporate these variables to provide a more comprehensive analysis.

Conclusions

This study contributes significantly to the understanding of suicide patterns in Southern Thailand, highlighting the higher suicide rates among middle-aged individuals and the effectiveness of the verbal autopsy method in confirming the cause of death.

Recommendations

These findings should inform both targeted suicide prevention strategies and the development of more comprehensive data collection systems to improve the accuracy of mortality statistics.

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