

Sex-Specific Suicide Trends and Patterns among Older Adults in East Asia: A Comparative Analysis of Japan, South Korea, and Taiwan

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Short abstract

Suicide remains a leading but preventable cause of death worldwide, claiming over 720,000 lives annually (WHO, 2025). While global suicide rates are highest among middle-aged men, older adults in East Asia – particularly Japan, South Korea, and Taiwan – exhibit elevated rates. This study examines temporal changes in suicide among adults aged 60+, focusing on sex-specific trends and cross-national differences.

Using data from Statistics Korea, the Taiwan Ministry of Health and Welfare, and the Human Mortality Database for Japan, we analyse years 2008–2021 for comparability across data sources. Age- and sex-specific mortality rates were calculated and age-standardised to the WHO World Standard Population. Trends were analysed using joinpoint regression to identify statistically significant shifts, estimating Annual Percent Change (APC) and Average Annual Percent Change (AAPC).

Older-age suicide rates declined in Japan, South Korea, and Taiwan, consistent with global trends. However, rates fell at different speeds: declines were faster for females than males in South Korea and Taiwan, but the opposite pattern was observed in Japan. Magnitude also varied; for instance, female rates in South Korea declined about 5% per year, whereas male rates declined more slowly (AAPC = 2.1%). Interestingly, these declines in South Korea coincided with expanding national suicide prevention efforts. Further analysis will examine whether declines in Japan and Taiwan are linked to their respective socio-economic policies.

This study provides cross-national evidence on the often-overlooked phenomenon of older-age suicide in East Asia, a region of high suicide rates, contributing to comparative demographic research on population ageing and well-being.

Extended abstract

Topic

Suicide remains a leading but preventable cause of death worldwide, claiming over 720,000 lives annually (WHO, 2025). While global suicide rates are highest among middle-aged men, recent evidence suggests a distinctive pattern in East Asia – elevated suicide mortality among older adults, particularly in Japan, South Korea, and Taiwan (Kim et al., 2011; Snowden, 2018). Although adolescent suicide tends to garner more attention due to its untimeliness, we argue through this work that older age suicide is crucial to examine in the context of rapidly ageing populations, where older adults grapple with longer life span living in frailty (Permanyer et al., 2023; Spiers et al., 2021). These three countries share comparable levels of economic development, are experiencing similar demographic challenges, and possess reliable long-term mortality data, making them well-suited for comparative analysis. Building on prior literature on older-age suicide in East Asia, this study focuses on identifying and characterising temporal changes in suicide mortality among older adults (aged 60+) in Japan, South Korea, and Taiwan. Specifically, it asks:

1. How have sex-specific suicide rates among older adults evolved over time in Japan, South Korea, and Taiwan?
2. When have statistically significant changes in suicide mortality trends occurred, and do these turning points align with major socio-economic or policy shifts?
3. To what extent do patterns and trends in suicide rates differ across these countries?

By addressing these questions, the study provides updated empirical evidence on older-age suicide in East Asia, highlighting cross-country trends and patterns relevant to population ageing and health inequalities.

Data

The study draws upon official mortality and population data for older adults (aged 60+) in Japan, South Korea, and Taiwan:

- Japan: Human Mortality Database (HMD), 1981-2021
- South Korea: Statistics Korea (KOSTAT), 1997-2023
- Taiwan: Ministry of Health and Welfare (MOHW), 2008-2024

For cross-country comparability, we limited the analysis to the overlapping period 2008-2021. Suicide deaths were identified using ICD-10 codes X60-X84, consistent with the HMD definition. The supplementary code Y87.0 (sequelae of intentional self-harm) was excluded to match HMD coding practices.

Age- and sex-specific mortality rates were calculated for 5-year age groups. All rates are age-standardised to the WHO World Standard Population to facilitate cross-national comparison.

Method

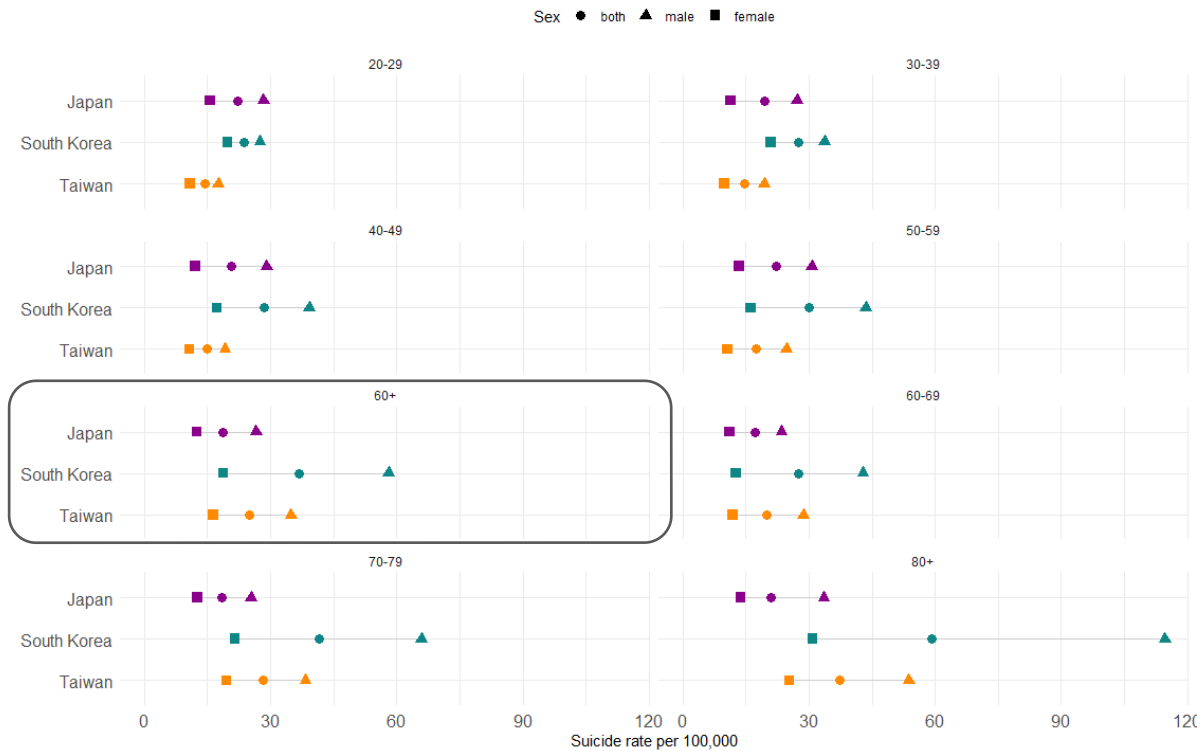
Suicide rates for males and females aged 60+ were analysed using the United States National Cancer Institute Joinpoint Regression Software (version 5.4.0.0). Joinpoint regression is a statistical method that identifies points in time – called *joinpoints* – where a trend significantly changes direction or slope. It does this by fitting lines through the points and testing whether adding breakpoints improves model fit compared to a simpler trend. This data-driven approach allows us to identify both the timing and magnitude of changes of suicide rates over time. Annual Percent Change (APC) was calculated by modelling the natural logarithm of the rates, providing a standardized measure of trend magnitude across countries. Meanwhile, Average Annual Percent Change (AAPC) summarises this average yearly change across the entire observation period.

Joinpoint regression has been widely applied in epidemiology and public health research (Zaino et al., 2025; Seaman et al., 2016), particularly in studies of cancer incidence and mortality (Sekar et al., 2024; Qiu et al., 2008), but also in suicide trends (Bertuccio et al., 2025; Puzo et al., 2016). Its ability to detect statistically significant shifts in the observed data makes it less susceptible to additional biases that could be introduced by imposing predefined breakpoints based on assumptions related to social, economic, or policy changes.

Findings

In 2021, suicide rates among older persons were 18.7 per 100,000 in Japan, 36.7 per 100,000 in South Korea, and 24.9 per 100,000 in Taiwan [Figure 1]. Unlike Japan which showed a relatively flatter pattern across age groups, rates increased with age in South Korea and Taiwan, with the highest rates observed among those aged 70-79 and 80+.

Figure 1. Suicide rate per 100,000 by age group and by country: 2021



Suicide rates among elderly males were higher than females across all three countries and the gap is large: male rates were twice as high as women in Japan (26.5 vs. 12.5 per 100,000) and Taiwan (34.8 vs. 16.4 per 100,000), and about three times as high as women in South Korea (58.1 vs. 18.8 per 100,000).

Preliminary joinpoint regression results over the study period indicate a general downward trend in older-age suicide rates [Figure 2]. Among females, suicide rates in South Korea declined more rapidly (AAPC = -5.2) than those in Japan (AAPC = -3.2) or Taiwan (AAPC = -2.9) [Table 1]. In contrast, among males, Japan saw a slightly faster decrease (AAPC = -4.4) compared to those in South Korea (AAPC = -3.9) and Taiwan (AAPC = -2.1).

To further elucidate these temporal trends, we looked at APC, which quantifies the average yearly change in suicide rates within each period. In South Korea, women's suicide rates fell by nearly 10% per year on average between 2010 and 2017 (APC = -9.67). Declines were also observed among the elderly in Japan (2013-2019, APC = -6.28) and Taiwan (2008-2021, APC = -2.88). Similarly, rates declined among men in Japan (2008-2017, APC = -5.22), South Korea (2010-2021, APC = -5.56), and Taiwan (2008-2021, APC = -2.10).

Figure 2. Suicide rates among (A) males and (B) females in Japan in purple, South Korea in teal, and Taiwan in orange (2008-2021)

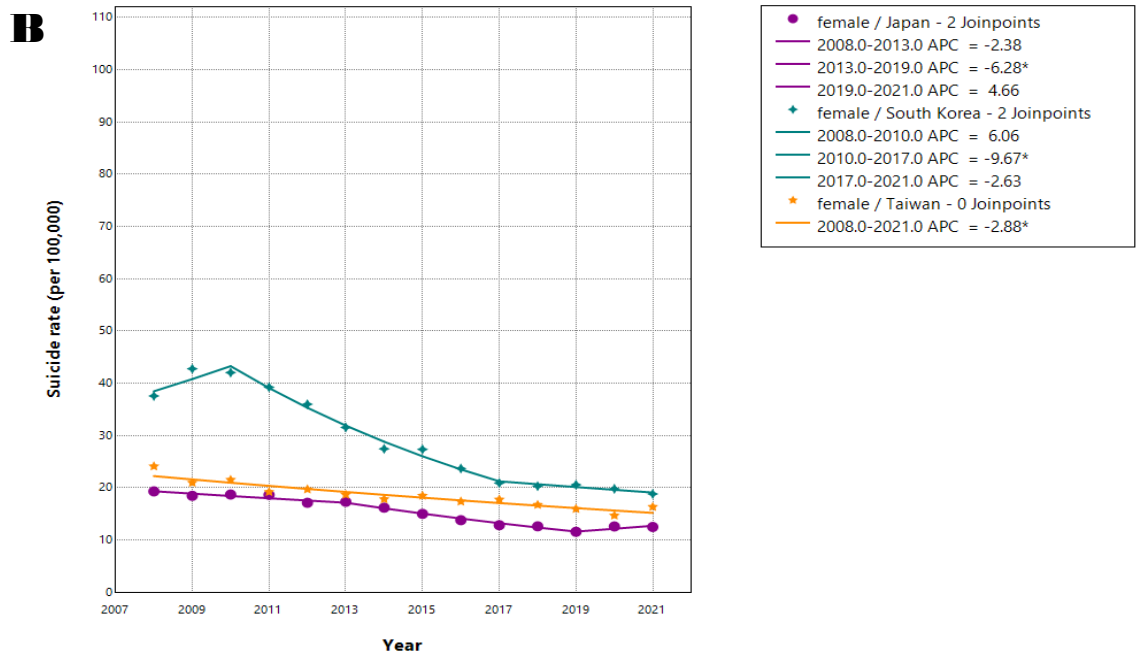
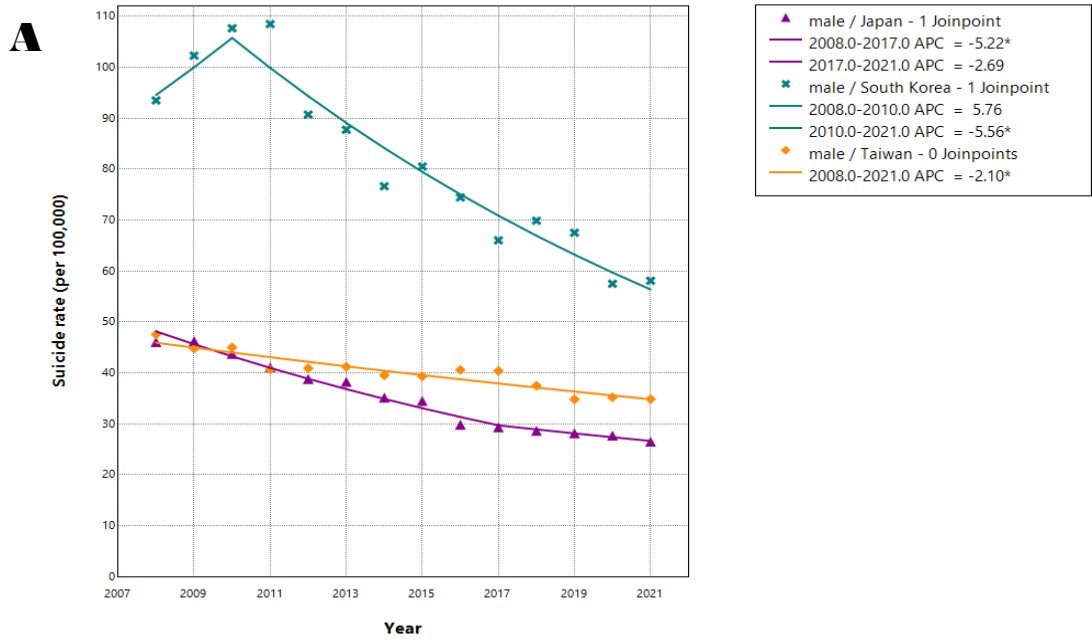


Table 1. Joinpoint regression analysis: changes in age-standardized suicide rates by sex and by country: 2008-2021

	Country	Period	APC (95% CI)	AAPC (95% CI)
Males	Japan	2008-2017	-5.2 (-7.3, -4.7)	-4.4 (-4.9, -4.0)
		2017-2021	-2.7 (-4.4, 0.9)	
	South Korea	2008-2010	5.8 (-3.8, 15.6)	-3.9 (-5.3, -2.7)
		2010-2021	-5.6 (-9.2, -4.7)	
Taiwan	2008-2021	-2.1 (-2.7, -1.5)	-2.1 (-2.7, -1.5)	
Females	Japan	2008-2013	-2.4 (-3.8, 1.9)	-3.2 (-4.0, -2.4)
		2013-2019	-6.3 (-10.6, -5.2)	
		2019-2021	4.7 (-2.6, 9.7)	
	South Korea	2008-2010	6.1 (-0.8, 12.0)	-5.2 (-5.9, -4.5)
		2010-2017	-9.7 (-12.4, -8.7)	
		2017-2021	-2.6 (-5.4, 3.3)	
Taiwan	2008-2021	-2.9 (-3.7, -2.0)	-2.9 (-3.7, -2.0)	

APC: annual percent change; AAPC: average annual percent change for 2008-2021; CI: confidence interval; **bold** indicates $p < 0.01$

Some of the decline in South Korea may reflect national suicide prevention efforts implemented since 2009, including regulatory measures to limit common means of suicide, gatekeeper training programs, and the establishment of legal and institutional frameworks such as the Suicide Prevention Act (2011) and the Korea Suicide Prevention Center (2012) (Kang et al., 2025).

In the next step, we will investigate whether the downward trend in suicide rates is unique to the older age group compared to the others, and whether similar policies or socio-economic factors explain trends in Japan and Taiwan. Alongside this, the study will examine whether this downward trend among older adults is unique compared to the younger age groups. Combined, this work seeks to unveil the unique attributes to suicide by sex and age group in a highly populated, high-income region.

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