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Prevalence of Suicidal Ideation, Attempts, and Completed Suicide Rate in Chinese Aging Populations: A Systematic Review

Melissa Simon, MD, MPH[1], **E-Shien Chang, MA**[2], **Ping Zeng, MD**[3], and **XinQi Dong, MD, MPH**[2]

[1]Feinberg School of Medicine, Northwestern University, Chicago, Illinois

[2]Rush University Medical Center, Chicago, Illinois

[3]Peking Union Medical College Hospital, Beijing, China

Abstract

Background—As one of the leading causes of death around the world, suicide is a global public health threat. Due to the paucity of systematic studies, there exist vast variations in suicide ideation, attempts and suicide rates between various regions of Chinese aging communities.

Objectives—Our systematic study aims to 1) identify studies describing the epidemiology of suicidal ideation, suicide attempts and behaviors among global Chinese communities; 2) conduct systematic review of suicide prevalence; 3) provide cross-cultural insights on this public health issue in the diverse Chinese elderly in China, Hong Kong, Taiwan, Asian societies and Western countries.

Data sources—Using the PRISMA statement, we performed systematic review including studies describing suicidal ideation, attempts, and behavior among Chinese older adults in different communities. Literature searches were conducted by using both medical and social science data bases in English and Chinese.

Results—Forty-nine studies met inclusion criteria. Whereas suicide in Chinese aging population is a multifaceted issue, culturally appropriate and inter-disciplinary approach to improve the quality of life for the Chinese older adults is critical.

Conclusions—Future research is needed to explore the risk and protective factors associated with suicidal thoughts, attempts and behaviors in representative Chinese aging populations.

Keywords

Suicidal ideation; psychological distress; older adults; Chinese population

Corresponding Author: XinQi Dong, MD, MPH, Director, Chinese Health, Aging and Policy Program, Associate director of the Rush Institute for Health Aging, Associate professor of medicine, nursing, and behavioral sciences at Rush University, Medical Center, Chicago, Illinois, 1645 West Jackson, Suite 675, Chicago, IL 60612, Phone: 312 942 3350, Fax: 312 942 2861, xinqi_dong@rush.edu.

Conflict of Interest Statement

None.

1. Introduction

Suicide is a global public health issue. It was estimated that suicide is the 13th leading cause of death worldwide (Yip, Liu, & Law, 2008). Data from World Health Organization suggest that almost one million people die from suicide every year, with a global mortality rate of 16 per 100,000. As suicide rates in the last half century increased by 60% worldwide, it is estimated that by 2020, suicide would account for 1.53 million deaths (Bertolote & Fleischmann, 2009). These projected deaths could lead to serious socioeconomic burden on the society, especially increasing the burden on health care.

Further, data suggested that suicide rate is extremely high among the elderly. The highest suicide rates in most countries are reported to be among persons over 75 year old (Diego D.L., Marirosa D.B., & Jonathan D., 2002; World Health Organization, 1999). For those left behind, losing a loved one to suicide is one of the most devastating losses of all to bear. It has long been reported that survivors of a loved one's suicide anguish in feelings of blame, anger, responsibility, guilt, and abandonment (Knieper A., 1999; Ellenbogen S. & Gratton F., 2001). Due to the increasing trend in worldwide elderly population, a corresponding increase in completed suicide is projected.

Chinese has the largest population in the world and represented about 24% of the Asian population. In recent years, vast economic growth, improvement in medicine and sanitation, also led to increased life expectancy, such that the population as a whole was aging rapidly.

Since 1999, China has become an aging country. Currently, Chinese older adults account for the world's largest aging population with 143 million people aged 60 years and older in 2004 (Leng, Tian, & Durso, 2008). By 2050, close to a third of China's population would be over 60 years, accounting for a quarter of the world's aging population. Despite the increasing awareness on elderly suicide among physicians, geriatricians and social work practitioners, there was no systematic study done on suicide among Chinese older adults. In addition, China did not have a comprehensive system to report vital statistics; there were varied ranges of report suicide rates. The studies with recorded data used mortality rates reported by local health official, such that the exact number may be underestimated (Samuel L. & Pozi L, 2008).

In addition, due to the paucity of systematic studies, there exist vast variations in suicide ideation, attempts and suicide rates between various regions. To fill the knowledge gap, our systematic study aims to 1) identify studies describing the epidemiology of suicidal ideation, suicide attempts and behaviors among global Chinese communities, 2) conduct systematic review of suicide prevalence, 3) provide a cross-cultural insights on this urgent public health issue among diverse Chinese elderly in China, Hong Kong, Taiwan, Asian societies and Western countries. Directions for future research and ways to improve care for the Chinese aging population are also discussed.

2. Materials and Methods

The study design was developed according to the PRISMA guidelines.

2.1 Eligibility Criteria

Studies eligible for inclusion were studies assessing suicidal thoughts, suicide attempts, and suicide behaviors among Chinese older adults in diverse communities, including Chinese elderly in China, as well as overseas Chinese communities. Studies that included older adults aged 60 and over who self-identified as ethnic Chinese were eligible for the review. Suicidal ideation was defined as self-reported thought that life is not worth living, or

thoughts to commit suicide. Suicide attempts were defined as a potential behavior to harm oneself without fatal outcome. We also included studies that assess the death by suicide rate. We included original research articles related to Chinese aging populations globally. The search was limited to studies available in full-text, written either in English or in Chinese. Manuscripts published over 2 decades ago were excluded.

2.2 Identification of Studies

Comprehensive literature research was conducted by searching both medical and social science data bases, including MEDLINE, PubMed, China journals full-text database (www.cnki.net), Wan Fang data (in Chinese). Search terms used included “Chinese,” “suicide and elderly,” “suicide and older people,” “suicide” in English, and “zì sha” (“suicide”) in Chinese. Secondary searching was performed by reviewing reference lists of eligible paper. Titles, abstracts, and full text articles where necessary, were screened by two bilingual reviewers. The opinion of the third independent reviewer was sought if agreement could not be achieved.

3. Results

Among the studies identified by the search strategy, 72 required further full-text screening. Forty-nine studies met inclusion criteria. The studies were conducted in different countries and regions, including: Mainland China, Hong Kong, Taiwan, Malaysia, USA, Canada, Australia, and England. In total, 8 studies on suicidal ideation were included (5 on Mainland China, 1 on Hong Kong, 2 on Taiwan), 6 studies on suicide attempts (4 on Mainland China, 1 on Hong Kong, 1 on Taiwan) and 35 completed suicide studies (21 on China, 5 on Hong Kong, 1 on Taiwan, and 8 on overseas Chinese). Findings are presented according to suicidal ideation, suicide attempts, and death by suicide rate assessed.

3.1 Prevalence of Suicidal Ideation

Suicide ideation was measured by asking respondents if they had ever had any suicidal thoughts, or feeling miserable, or feelings that life was not worth living, at the point of the survey (Chan, Liu, Chau, & Chang, 2011; Yen Y.C. et al., 2005). Suicidal ideation rate are synthesized by the region, study population studied as well as methodology used in Table 1.

Due to the lack of large-scale studies on both rural and urban areas in Mainland China using standardized assessment tools, studies among rural and urban community-dwelling older adult in China suggest that suicidal ideation rate ranges from 2.2–16.7% (Tao R.Q., Zen Z., Zhong G.L., Cha W.T., & Liang W., 2011; Ma X. et al., 2009; Gong Y., Zhang L., Wang Z., & Liang Y., 2011; Fu, Feng, Zhou, Tang, & Xiao, 2007; Zhang J., Stewart R., Phillips M., Shi Q., & Prince M., 2009; Yip, 1997). A rural and urban comparison study in Beijing, China, reported that the urban sample reported 2.3% of overall lifetime prevalence suicidal ideation, which was higher than their rural counterpart sample (Ma X. et al., 2009). In other studies on rural community-dwelling older adults, women group and older age reported higher ideation rate (Fu et al., 2007; Jun, 2006). Compared to other samples of community-dwelling older adults with no mental disorder diagnosis, suicidal ideation rate among was extremely high among elderly patients with mental health illness, with 41.2% estimate of prevalence reported in an inpatient sample in Shanghai, China(Zhang, Feng, Wu, & Su, 2006).

The prevalence of suicidal ideation in Hong Kong is reportedly similar or higher among older adults to that in the Western countries. Research in Hong Kong community-dwelling older adults found 6% of the sample ever had suicidal ideation (Yip et al., 2003). Similarly, in Taiwan, large-scale investigation on elderly suicidal ideation showed the point prevalence varies from 6.1% to 16.7%. Women and seniors with depressive symptoms were cautioned

about the risk of suicidal ideation (Chan et al., 2011; Yen Y.C. et al., 2005). However, most studies concurred that the association of suicidal ideation to self-destructive acts remains to be determined.

3.2 Prevalence of Suicide Attempts

Suicidal thoughts and attempts are among the strongest risk factors for completed suicide. Despite its public health significance, there has been limited information on attempted suicide in the elderly, especially among Chinese populations (Table 2). Studies on suicide attempts across all regions in Chinese populations report that compared to older adults without mental disorders, older adults who were diagnosed with mental disorders exhibited higher rates of suicide attempt, ranging from 60% among women with depression in a clinical setting in Nanjing(Qin & Wu, 2002), to 25% among patients diagnosed with depression in Shanghai, China (Zhang et al., 2006). Riskof suicide attempts also increased with age, and may decrease only after 85 years old (Chiu, Lam, Pang, Leung, & Wong, 1996).

Concerning methods employed for attempted suicides, in contrast to attempters in western societies, self-injury was more common than self-poisoning which is possible due to cultural differences or sample populations. Incision and drug over-dose had been most commonly reported among attempters in Chinese populations (Yang C.H., Tsai S.J., Chang J.W., & Hwang J.P., 2001; Chiu et al., 1996).

3.3 Prevalence of Suicide Completion Rate in China, Hong Kong, Taiwan

We presented our review according to national and regional data in Mainland China, Hong Kong and Taiwan (Table 3).

Evidence suggested that the prevalence of suicide among Chinese adult with the completion suicide rate of 13/100,000 in 1999 approached or even surpassed those in Western countries (World Health Organization, 1999). In a national sample presented in 2011 China's Health Statistics Yearbook, the average suicide rate in 2010 was 6.86/100,000 in urban and 10.01/100,000 in rural areas (Ministry of Health of the People's Republic of China, 2011). Various studies document that elderly population had much higher prevalence rate than that of general population. Phillips et al reported the mean annual suicide rate was 23/100,000 (incidence 0.02%) in 1995–1999, with approximately 330,000 suicide deaths per year significantly higher than the mean, suicide rate among elderly aged 60–84 was 68/100,000 (Phillips, Yan, Li, Hui, & Mai, 2002; Phillips, 2002).

The elderly suicide rate among rural samples is also higher than that of their urban counterparts (Hendin et al., 2008). It is reported to range 11.54–89.46/100,000 in urban and 17.7–191.7/100, 000 in rural areas (Ministry of Health of the People's Republic of China, 2011). In addition, suicide completers in rural areas shared 90% of total years of life lost (Yip et al., 2008).

Regarding socio-demographic characteristics, suicide completion in mainland China shows unique demographic patterns with age and female gender, that the older age group and female group is associated with higher suicide mortality (Li X., Xiao Z., & Xiao S., 2009; Rebholz C.M. et al., 2011; Pritchard C. & Baldwin D.S., 2002).

Differences and similarities were examined of suicide in Hong Kong, China and Taiwan, the populations of which are all ethnically Chinese and share some characteristics of culture but which have very different social and political environments. In Hong Kong, suicide rate in elderly was 25–30/100,000, in 1997–2001(Yip P.S.F., Law C.K., & Law Y.W., 2003), although suicide rate among the general population was comparable to that of other

countries. Similarly elderly suicide rate and female suicide rate were higher relative to those rates in many Western countries (Tsoh et al., 2005; Yip P.S.F., Iris C., & Gabriel K.K.Y., 1998). In Taiwan, the suicide rates in adult aged 45–64y were 15.2–45.2/100,000 in male and 7.5–18/100,000 in female, 1971–2005(Jin J.L. & Tsung H.L., 2008). Despite the rapid economic growth in all three regions in a cross-region study, the differences in suicide trends suggest that the social and political environments may be more important than the economic environment in suicide (Yip P.S.F., 1996).

3.4 Prevalence of Suicide Completion Rate in Overseas Chinese Population

Due to the diversity of overseas Chinese populations, researchers have began to investigate suicidal behavior among Chinese older residents in the context of migration in Asia, North America, Europe, and Australia (Shah, Lindesay, & Dennis, 2011; Ide, Kõlves, Cassaniti, & De Leo, 2012; Hayati, Salina, Abdullah, Eusni, & Mansar, 2004; Burville P.W., 1995) (Table 4). In the U.S. Chinese elderly were found to have the highest suicide rate among all the racial/ ethnic groups(Tsoh et al., 2005; Reza A., Mercy J.A., & Krug E., 2001). Suicide rate among older Chinese women was 4–5 fold higher of death compared to the general population's(Centers for Disease Control and Prevention, 2010; Foo, 2003).

In Singapore, where Chinese made up the majority of its diverse population of Chinese, Malay, Indians, and Eurasians, suicide rates for ages above 65 ranged 26.9–44.6 in male, 14.1–25.8 in female in 2005–2009 (Lai G.K.D., Beng Y.N., Tih S.L., & Huei Y.L., 2011). In other reports, Chinese elderly suicide rates were 23/100,000 in Malaysia(Hayati et al., 2004).

4. Discussion

4.1 Contribution to Existing Literature

The graying of Chinese elderly community in the world warrants the attention of health professionals and policy makers to provide linguistically and culturally sensitive quality care to improve the quality of life of Chinese older adults. First, the role of culture as a contextual factor in influencing the relevance of stressors for predicting suicidal thoughts and behaviors should be taken into consideration, both in Chinese communities in Asia as well as abroad. Strongly influenced by Confucian teachings, Chinese culture prescribes one's role and responsibility in relation to others. The "five relationships" not only strictly prescribes one's social behaviors, but also, these social relationships provide a supportive network that bind individuals together, and nurture filial intergenerational relationships (Mencius & Lau D.C., 2005). However, in the face of social-cultural changes brought about by rapid industrialization, modernization and immigration, family structures and social support may undergo significant transformations. Older adults may receive insufficient filial support and care, which in turn provide fertile ground of psychological distress leading to suicide behavior. Therefore, elderly suicide prevention needs to be a coordinated effort from family members, community members, and medical professionals. Strengthening the culture of filial piety by giving the elderly the care and respect they needed.

Second, a better understanding on the relationship between suicidal thoughts, attempts, to completed suicide, is much needed for suicide prevention and intervention program. Features that distinguish suicide completers from suicide attempters may highlight implications for the secondary prevention of suicide in Chinese older adults. Whereas one studies show that the socio-demographic and health profiles of suicide attempters and completers in Chinese community were similar, there were still a number characteristics that are reported, including differences in suicide intent, hospitalization and functional health (Tsoh et al., 2005). From the practitioners' perspectives, early identification of suicide

ideation and devising targeted prevention and intervention strategies could prevent further suicide ideation into further suicide attempts.

Moreover, we should better our understanding the linkage between mental health and suicidal thoughts, attempts and ideations. Community education programs are needed to be conducted to improve understanding of mental illness and the availability of treatment for the issues is also necessary. In addition, we should advocate caring for the elderly through respect. Medical professionals and caregivers should also be mindful of assisting older Chinese immigrants with appropriate cultural sensitivity while being aware of the importance of early detection of suicide ideation.

Fourth, in the future, medical professionals should consider screening older patients for suicidal risk factors by integrating questions on suicidal thought into routine medical history taking for older adults. Close monitoring of older adults who has suicide ideation could help clinicians and social agencies involved to monitor them more closely and set the basis for future intervention studies to examine the effectiveness of such preventative measures in the community population. These findings could have important implications not only for geriatricians, but also for multiple disciplines that work with older adults with suicide risk. Other relevant disciplines such as nursing, social workers, and social services agencies, who work with older adults with suicide ideation or risk for suicide, could be in unique positions to identify and intervene on predisposing factors that might lead to completed suicide. In addition, it is important for all relevant disciplines to monitor the progression of suicide behaviors in older adults.

4.2 Limitations

There are limitations in our present review. Despite suicidal phenomena are described as completed suicides, suicide attempts or ideation, there are variations of scales used in measuring suicidal ideation, as well as attempts. In addition, we only included publications from the past 2 decades and may not be able to provide the trend in growing suicidal behaviors. More systematic research is needed to provide and explain the complex psychosocial issue of suicide, as well as cultural context by which suicide may take place also warrants further exploration.

4.3 Implications

This study has wide implications for healthcare professionals, social services agencies and policy makers. Early detection and prevention of elder suicide is critical. Specifically, mental health and health professional at the front line levels should consider outreach programs particularly designed to increase familial, social and community support for vulnerable older adults.

In addition, whereas some prevention programs on elderly suicide exists, very few follow-up projects that investigates the effectiveness of the programs. Longitudinal studies on the risk and protective factors, consequence, and the effect of existing prevention programs. Moreover, direct suicide prevention strategies with culturally and linguistically sensitive services including hotlines and counseling programs should be expanded.

5. Conclusion

In this review study, we discussed the prevalence rates of suicidal ideation, attempts, and completed suicides among diverse Chinese populations. Our review shows that the prevalence rates vary by regions, methodology as well as population studied. Culturally sensitive and inter-disciplinary approach to improve the quality of life for the diverse

Chinese older adults is critical. Continued research to assess the casual mechanism and consequences associated with suicidal thoughts is warranted.

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Table 1

Results from Key Studies on Suicidal Ideation in Chinese Aging Populations

Author, Year	Study Design	Study Population	Key Findings
Chan, 2011	CS	3,853 community-dwelling older adult ≥ 65 years in Taiwan	Point prevalence of suicidal ideation: 6.1%
Tao, 2011	CS	670 community-dwelling older adults ≥ 60 years in rural China	Suicidal ideation: 13%
Ma, 2009	CS	1,159 community-dwelling older adults ≥ 65 years in Beijing China	Lifetime ideation: 2.2%
Fu, 2007	CS	851 community-dwelling older adults ≥ 55 years in rural China	12-month ideation: 17.8% among age group >65, 16.8% among age group 55–64 years
Jun, 2006	CS	915 community-dwelling older adults ≥ 60 years in rural China, 153 controls	Suicidal ideation rate 16.72%, male: 12.50% (9.26–15.73%), female 20.00% (16.55–23.45%)
Zhang, 2006	CS	131 elderly inpatients aged 60–85 years with depression in Shanghai Mental Health Center	Suicidal ideation: 41.2%
Yen,2005	CS	1,000 community-dwelling older adults aged 65–74 years in Taiwan	Suicidal ideation within the past week: 16.7%
Yip, 2003	CS	917 community-dwelling older adults ≥ 60 years in Hong Kong	Lifetime suicidal ideation: 6%

CS: Cross-sectional study

Table 2

Suicide Attempts in Chinese Aging Populations

Author, Year	Study Design	Study Population	Key Findings
Wu, 2011	CS	1,042 patients with suicidal behaviors being treated in emergency room in Shanghai, China	Patients age > 60 years old account for 8.93% of all suicide attempts
Ma, 2009	CS	5,926 community-dwelling adults sample, in which 1,159 are aged over 65 years in Beijing, China	Suicide plans among older adults age >60 years: 1.3%; Suicide attempts: 1.2%
Zhang, 2006	CS	131 patients with depression aged 60–85 years in Shanghai Mental Health Center, China	Suicide attempts : 25.2%
Qin, 2002	CS	80 depression female patients aged > 60 years, discharged from a mental disorder hospital in Nanjing, China	Suicide attempts : 60% Suicide methods: poison, gas 64.46%; jumping or electric shock and railway 36.54%
Yang, 2001	CS	722 patients aged > 65years in a hospital in Taiwan	Suicide attempts : 7.6% Suicide methods: incision (40%), drug overdose (27.3%), poisoning (10.9%), propelling into wall (9.1%), hanging (7.3%), jumping (7.3%), drowning (3.6%)
Chiu,1996	CS	55 patients age > 65 years with suicidal attempts in a psychiatric unit in Hong Kong	Suicide methods: drug over-dose (27.3%): psychotropic drugs (60%, with benzodiazepines accounting for 77.8%); antihypertensive drugs(20%); nonopiate analgesics (paracetamol, 13.3%); self-injury (72.7%); ingestion of corrosive or detergent (32.5%), jumping (16.3%), wrist-cutting (11.6%), hanging (9.3%), and drowning (7.0%)

CS: Cross sectional study

Table 3

Completed Suicide in Chinese Aging Populations in China, Hong Kong, Taiwan

Author, Year	Population and Setting	Key Findings (Suicide rate per 100,000)					
China, National Data							
Ministry of Health of the People's Republic of China, 2011	Community data from China's Health Statistics Yearbook 2011	SR(per 100,000)	Average	Age			
				60–69y	Over 85y		
		Area			Mean	Male	Female
		Rural	10.01	17.67	191.74	256.81	159.7
		Urban	6.86	11.54	89.46	117.48	71.95
		Large city	6.42	9.93	68.41	84.22	58.23
		Middle-small city	8.37	17.41	217.27	348.35	149.01
Rebholz, 2011	169,871 community-dwelling adults age 40 years and older in China	After 8 years follow-up, Total: 14.1, ≥ 70 years (yrs): 32.6, Male/Female 25.0/36.3; Aged 60–69: 11.7, Male/Female 8.7/14.2					
Heldin, 2008	CDC data, China community	Total: 13.9. Rural: 16.8, Urban 4.0					
Yip, 2005	Community data, China 1991–2000	In urban areas, significant decrease in suicide rates: Age above 70y: M: b= −1.37, p=0.006; F: b= −1.40 p=0.000. 60–69y: M: b= −0.66, p=0.003; F: b= −0.66, p=0.012.					
Phillips, 2002	Community-dwelling adult mortality data in China, 1995–1999	Total: 23 Aged 60–84: 68.0.					
Qin,2001	Community data in China	Total: 20.5, Age > 75: 104.4, Male/Female: 120.7/88 Aged 60–75: 70.8, Male/Female 79.8/61.8					
Pritchard, 1996	Community data in China	Male/female: 15.0/19.5, Aged> 75: 90.1/71.0; Aged 65–74years: 49.9/44.3, Aged 55–64 years: 27.7/26.5; 1990 rural: Male/female 20.3/23.6, Aged> 75: 139.5/74.3; Aged 65–74: 80.0/51.0, Aged 55–64: 46.3/32.5; 1990 urban: Male/female 8.1/9.1, Aged> 75: 58.9/46.3; Aged 65–74: 25.2/20.1, Aged 55–64: 13.1/12.2					
Yip, 1996	Community data in Hong Kong and Taiwan, 1981–1994; Beijing 1987–1994.	Hong Kong: men aged above 75 years: 39 (in 1981)-68(in 1994); Taiwan: women aged 65–74 years: 37(in 1981) – 13(in 1994); Beijing: men aged 75 years and above: 80 (in 1987)-61(in 1994); women aged 75 years and above: 56 to 32.					
China, Regional data							
Lan, 2010	23,161 urban community-dwelling inhabitants in Harbin city, China	Aged ≥ 65: 14.91					
Hu, 2008	Community data in Zhejiang, China	Aged ≥ 65: Total 34.69; Urban: 18.38; Rural: 45.09 Aged 55–64: Total 17.53; Urban 10.9; Rural 21.81					
Li,2006	Community data in Zhuhai, China	Total: 6.61. Aged ≥ 80: 74.41. Aged 70–79: 38.26. Aged 60–69: 13.48					

Author, Year	Population and Setting	Key Findings (Suicide rate per 100,000)
Xie, 2006	Community data in Ningbo, China	Total: 32.08. Aged ≥ 85: 53.21. Aged 80–84: 56.06. Aged 75–79: 42.07. Aged 70–74: 28.88. Aged 65–69 years: 20.96
Xu,2004	Community data in Shanghai, China	Aged ≥ 60: 6.9–12.7.
Lu, 2004	134 rural community suicide elderly age >60y, Chang Sha, 1996–2000	Total: 103.69, Male: 116.37, Female: 90.74
Cheng, 2003	Community data in Ningbo, China, 1987–2001	Male/Female above 85 years: 83.9/70.74. Aged 80–84: 73.39/32.25. Aged75–79: 51.86/25.4. Aged 70–74 years:51.04/31.37. Aged 65–69: 25.84/19.05, Aged 60–64: 22.45/12.67
Dong, 2002	Community data in Hubei, China, 1978–1999	Total: 15.67, Aged > 60: 59.48,
Qi, 2001	Community data in Nantong, China, 1995–2000	Male/Female total: 3.76/3.62 Male/ Female age ≥ 60 years:11.86/10.13
Xiao, 2001	Community data in Shanghai, China, 1997–1999	Age ≥ 65 years: 20.3
Xu, 2000	Community-dwelling older adults in Urban and Rural Hunan, China	Urban: 33.5, Male/Female 1:1 Suicide methods: poison (29.4%), hanging(28.4%),, jumping(16.1%), drowning(12.3%) Rural older adults: 110, Male/Female 1.4:1, Suicide methods: poison (68.2%), hanging (23.7%), jumping(0.3%), drowning(5.8%);
Xu,1999	Community data in Hunan, China 1987–1997	Total : 5.5 Aged ≥ 65: 18.3
Liu,1995	69 community suicide adult aged >60 in Si Chuan province	Total: 44.34, Male/Female 57.77/29.16 Above 80 years old: 66.7 Aged 75–79: 39.93 Aged 70–74: 23.7 Aged 65–79: 41.43 Suicide methods: hanging(49.3%), poison(39.1%) and drowning
Hong Kong		
Cheung, 2008	Community-dwelling older adults over 65 years old in Hong Kong	Pre-SARS: 39.19 in 1994, to 28.44 in 2002; Peri-SARS: 40.35 in 2003, Post-SARS 33.95 in 2004
Yip, 2003	Community data of Hong Kong residents from 1981–2001	Aged> 60: from 30 in 1997, to 25 in 2001
Chi,1998	279 community suicide elderly over 60 years old inHong Kong	Total:36.6; Aged > 75: 67.3, Aged 70–74: 42.5, Aged 65–69 :22.9; Aged 60–64: 21.5
Yip,1998	Community data in Hong Kong and Singapore	Age > 75y: Singapore:78; Hong kong:54;

Author, Year	Population and Setting	Key Findings (Suicide rate per 100,000)
Yip,1998	Community –dwelling older adults over 60 years old in Hong Kong	in 1995: Aged 75>:50, 60–74y:23; Methods: Hanging: 59% (in 1981) – 36% (1995); Jumping: 29% (in 1981) – 52% (in 1994); Poisoning: 10% (in 1981) – 6% (in 1995).
Taiwan		
Jin, 2008	Community data in Taiwan, 1971–2005	From 1993–2005: Male:12.8–34.6, Female: 6.9–15.7
Ruo, 2007	Community data in Taiwan, 1993–2005	Male/ Female:49.3/ 29.6

Table 4

Completed Suicide in Chinese Aging Population in Overseas Chinese Communities

Author, Year	Population and Setting	Key Findings (Suicide rate per 100,000)
Ide,2012	The first-generation immigrants over 15 years old in Australia, 1974–2006	From 2001–2006: China-born immigrant: Male:10.7, Female:5.5, Hong Kong-born immigrant: Male:5.7, Female:3.4
Shah, 2011	Community data on suicides in England and Wales, 2001–2005	China-born immigrantes aged 85: M/F: 0/59.7, Aged 80–84: M/F: 0/50.8, Aged75–79: 0/105, Aged 70–74: 13.2/82.7, Aged 65–69: 16.8/35.5, Aged 60–64: 7.6/0.
Hayati, 2004	Among 76 suicide cases in a hospital in Malaysia, 40 cases are Chinese	The suicide rate for the Chinese is 8.6 per 100,000, but it increased to 23 per 100,000 among the elderly Chinese. Suicide methods: poisoning (39%), hanging (34%) and jumping (22%)
Singh, 2004	Community data in District of Columbia, US	SR (per 100,000): Chinese: Men Suicide 8.06, woman 6.37. and China-born Chinese had 125%, and 95% higher SRs than their US-born counterparts.
Malenfant, 2004(Malenfant E.C., 2004)	Community-dwelling immigrants in Canada	From 1995–1997: Chinese immigrant aged 65–74: 8.7, Canadian: 13.9
Hunt, 2003	282 sample of suicides in England and Wales over 4 years	Suicide methods in Chinese sample: hanging 58%, burning 17%, self-poisoning 8%, drowning 8%
Burvill, 1995	2,345 males and 895 females age 65 years and older in Australia, 1979–1990	China-born older immigrants: M /F 57.1/ 27.0, Australian: 28.2 / 7.4
Lester, 1994	Epidemiological patterns of suicide in USA	Chinese >65 years: 25.9, aged 55–64: 9.7. Suicide method: hanging 43.3%, poison 10.4%, firearms 10.4%, gas 4.5%