

Suicide in Older Adults in Long-Term Care: 1990 to 2005

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OBJECTIVES: To describe the characteristics associated with suicide in older persons residing in long-term care (LTC) facilities, to compare the characteristics of suicide cases in LTC with those of cases in the community, and to evaluate trends in suicide in these settings over the past 15 years.

SETTING: The New York City (NYC) Office of the Chief Medical Examiner (OCME).

PARTICIPANTS: Suicide deaths in NYC from 1990 to 2005.

MEASUREMENTS: Location and method of suicide death reported by OCME.

METHODS: Suicides in older persons in LTC and community-dwelling older adults were compared in terms of demographic characteristics and method used. Trends in suicide rate ratios (RRs) were examined using zero-inflated Poisson regression.

RESULTS: Over the study period, there were 1,771 suicides among NYC residents aged 60 and older: 47 in LTC and 1,724 in the community. Cases in LTC tended to be older ($P < .02$) but did not differ from community cases in terms of race or sex. Suicides in LTC were significantly less likely ($RR = 0.05$, $P < .002$) to be due to firearms and 2.49 times as likely to be due to a long fall ($P < .002$) as community cases. Over the 15-year period, there was a significant decrease in the relative rate of suicide in community-dwelling adults ($RR = 0.97$, $P < .001$) but no change in residents of LTC ($RR = 1.05$, $P < .17$).

CONCLUSIONS: Suicide risk in community-dwelling older adults has declined over the past 15 years but has not changed in LTC facilities. This suggests that prevention efforts may not be reaching this population effectively. *J Am Geriatr Soc* 56:2107–2111, 2008.

Key words: suicide; long-term care; epidemiology; older adults

Seventeen percent of the U.S. population is currently aged 60 and older, and that proportion is expected to increase substantially over the next few decades.¹ Older adults have the highest risk of suicide in the nation.² Important risk factors for suicide in this group include psychiatric disorders, physical health problems, life events and social stressors (i.e., financial strain during retirement), and disability.³ A prominent health concern of aging adults is the need for long-term care (LTC) as medical advances extend years of life, particularly years living with a chronic health condition. According to the 2004 National Nursing Home Survey, nearly 1.5 million adults reside in LTC.⁴ Prominent predictors of admission to LTC include disability, cognitive impairment, living alone, lower socioeconomic status, and older age.⁵

Few studies have examined the intersection between suicide risk and residency in LTC. Many were conducted before the advent of alternatives to LTC in the 1990s such as homecare, and all reported on relatively few (all ≤ 30) cases. One of the first studies reported a lower rate (contrary to what was stated in the Conclusion) of suicide in nursing home residents aged 70 and older than in community-dwelling elderly people.⁶ In contrast, another study reported a suicide rate in LTC residents aged 60 and older substantially higher than in the general population (94.9 per 100,000).⁷ This finding was replicated by a more recent study that found a higher rate of suicide in LTC residents aged 65 and older than in the general regional population (18.6 vs 8.9 per 100,000, respectively).⁸ There is also limited research on the methods used to complete suicide in LTC, which could be useful for prevention efforts. In contrast to suicide in older adults in the general U.S. population, in which the most frequently used method is firearms,⁹ these studies report that the most commonly used methods in LTC are hanging^{6,10} and jumping or falling,⁸ although these findings should be viewed as only suggestive, given the limited sample sizes of the reports.

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To understand the correlates of suicide in older adults in LTC and identify potential avenues for preventing suicide in this group, the sociodemographic characteristics and methods used by suicide cases in LTC facilities were compared with those of older adults living in the community. The trend in suicide risk in these two groups over the 15-year period from 1990 to 2005 was also evaluated.

METHODS

The Office of the Chief Medical Examiner (OCME) of New York City (NYC) is responsible for assessing all deaths of persons believed to have died in an unnatural manner (suicide, homicide, accident) in the metropolitan area. The catchment area for the NYC OCME is approximately 8 million people and consists of five boroughs: Brooklyn, Bronx, Manhattan, Queens, and Staten Island. The OCME uses the decedent's medical history, the circumstances and environment of the fatality, autopsy findings, and laboratory data to attribute cause of death to each case reviewed. The OCME reviews suicide deaths in NYC, which are coded in medical charts. All cases of suicide deaths in NYC from 1990 through 2005 were identified through abstraction of medical files at the OCME. Data regarding demographic characteristics, means of suicide, location of death, and toxicology were collected. Suicides in persons in LTC were compared with suicides in community-dwelling NYC residents. LTC was defined as a designated LTC facility or nursing home (not including general or psychiatric hospitals). "Community-dwelling" was defined as any location other than jail or prison or a homeless shelter or if the person was known to be homeless. Three cases, two that occurred in a prison or jail and one that occurred in a homeless shelter, were excluded because of this definition of community-dwelling.

The total number of suicides and the number of suicides attributable to LTC and community-dwelling NYC residents aged 60 and older from 1990 to 2005 were examined, and the demographics (age, race, sex) and circumstances of the death for all suicide decedents were characterized. Chi-square tests and Fischer exact tests were used to assess the

association between decedent characteristics and location (LTC vs community) of suicide. Poisson regression with robust standard errors was used to evaluate change in number of suicides over the 15-year period for community-dwelling and LTC residents. When appropriate, zero-inflated Poisson (ZIP) regression, which accounts for overdispersion introduced by frequent zero counts by parametrically modeling heterogeneity in the outcome,¹¹ was used to model suicide counts by year. Choice between competing models (with or without the additional heterogeneity parameter introduced by ZIP) was determined by comparing Bayesian Information Criteria (BIC) and Akaike Information Criteria (AIC). Smaller AIC and BIC values indicate better overall fit. Differences in trends over time according to setting were evaluated using the Cochran-Mantel-Haenszel (CMH) statistic. All analyses were conducted using SAS (v9.1, SAS Institute, Inc., Cary, NC) and STATA (v9, Stata Corp., College Station, TX), and all *P*-values refer to two-tailed tests.

The institutional review boards at the New York Academy of Medicine and the NYC Department of Health and Mental Hygiene reviewed and approved this study.

RESULTS

Over the 15-year period from 1990 to 2005 there were 47 suicides in residents of LTC facilities and 1,724 suicides in community-living adults aged 60 and older in NYC (Table 1). The LTC group was relatively older (mean age 76.2, range 61–93) than the community-dwelling group (mean age 72.9, range 60–103). In both groups, most decedents were male (61.7% of LTC and 69.7% of community-dwelling) and non-Hispanic white (68.1% of LTC and 72.0% of community-dwelling). The distribution of methods used in LTC reflected the more-restrictive nature of this setting (Table 2). Method of suicide was unknown for one decedent. Suicides in LTC were less likely to be due to firearms (odds ratio (OR) = 0.05, *P* < .002) and more likely to be due to a long fall (OR = 2.49, 95% confidence interval (CI) = 1.39–4.46) than in community-dwelling older adults.

Table 1. Characteristics of Suicides in Residents of New York City Aged 60 and Older According to Location, 1990–2005

Characteristic	All (N = 1,771)	LTC (n = 47)	Community Dwelling (n = 1,724)	P-Value
	n (%)			
Male	1,231 (69.5)	29 (61.7)	1,201 (69.7)	.24
Age				
60–69	742 (41.9)	13 (27.7)	729 (42.3)	.02
70–79	557 (31.4)	15 (31.9)	541 (31.4)	
≥80	473 (26.7)	19 (40.4)	454 (26.3)	
Race or ethnicity				
White	1,275 (72.0)	32 (68.1)	1,242 (72.0)	.27
Black	150 (8.5)	2 (4.3)	148 (8.6)	
Hispanic	178 (10.0)	5 (10.6)	173 (10.0)	
Asian or other	169 (9.5)	8 (17.0)	161 (9.3)	

Note: Percentages refer to each location category, and *P*-values refer to chi-square test comparing long-term care (LTC) to community-dwelling within category. For comparison, over the same period there were 20 suicides in LTC residents (75% male) and 5,831 in the general community (75.1% male) in adults younger than 60.

Table 2. Method of Suicide in Residents of New York City Aged 60 and Older According to Location, 1990–2005

Method of Suicide	All (N = 1,771)	LTC (n = 47)	Community Dwelling (n = 1,724)	P-Value
	n (%)			
Overdose*	224 (7.0)	4 (8.5)	220 (12.8)	.39
Hanging	503 (28.4)	17 (36.2)	486 (28.2)	.23
Long fall	533 (30.1)	24 (51.1)	509 (29.5)	.002
Cutting	81 (4.6)	2 (4.3)	79 (4.6)	1.00 [†]
Firearms [‡]	286 (16.1)	0 (0.0)	286 (16.6)	.002
Other [§]	143 (8.1)	0 (0.0)	143 (8.3)	1.00 [†]

Percentages refer to each location category, and P-values refer to chi-square test comparing long-term care (LTC) with community dwelling within method category unless otherwise noted.

Note: cause of death was unknown for one community-dwelling decedent.

* Overdose includes illicit or prescription drugs, unspecified drugs, or alcohol.

[†] P-value for Fischer exact test comparing LTC with community-dwelling within category.

[‡] A value of .5 was imputed for LTC to calculate the odds ratio reported in the text.

[§] Poisons, gases, drowning, electrocution, short fall, train or other moving object, motor vehicle, fire, burns or smoke inhalation, and any other cause.

As shown by Figure 1, over the 15-year period, there was a decrease in the number of suicides per year in community-dwelling older adults (rate ratio (RR) = 0.97, 95% CI = 0.96–0.98, $P < .001$). Model fit statistics indicated that the ZIP was a better fit to the LTC data than the uncorrected Poisson model. (There were no zero-counts in the community data.) There was no change in the number of suicides in older adults in LTC ($RR_{ZIP} = 1.05$, 95% CI = 0.98–1.12). The CMH statistic showed that these time trends were significantly different across the LTC and community settings (chi-square = 7.74, degrees of freedom = 1, $P < .005$).

placement altogether.¹² It is unknown whether these changes have affected outcomes in LTC, but as a consequence, earlier studies of suicide in this setting may not be readily applicable to the present situation.

The data suggest a decline in the number of suicides in community-dwelling adults aged 60 and older since 1990, which is consistent with national trends for this age group¹³ (although this comparison of rates and counts should be interpreted with caution). However, no change in the number of suicides in older adults in LTC was found, suggesting that whatever protective factors are acting on community-dwelling elderly people in NYC are not reaching those in LTC. In the United States generally, the demographic and health characteristics of persons in LTC are markedly different from those of community-living older adults (e.g., persons in LTC are more likely to be white, female, and have dementia than elderly people in the community).⁴ Despite this, the racial and sex distribution of decedents living in LTC did not differ from community-dwelling cases, an unexpected result. This suggests that the LTC setting does not substantially alter the distribution of suicide risk in older adults despite differing sociodemographic composition, risk factors, and the unavailability of commonly used methods. In contrast to national studies of suicide methods,

DISCUSSION

This study adds to the limited literature on suicide risk in nursing homes and LTC facilities by comparing 15-year trends in suicide risk of LTC-residing and community-living older adults. To the authors’ knowledge, this is the largest study of suicide in LTC to date. In addition, recent data were used that better reflect the current state of LTC, which is important because the average size of LTC facilities has increased substantially over the past 35 years and the advent of alternatives to LTC in the 1990s, such as homecare, may have enabled some persons to delay or prevent LTC

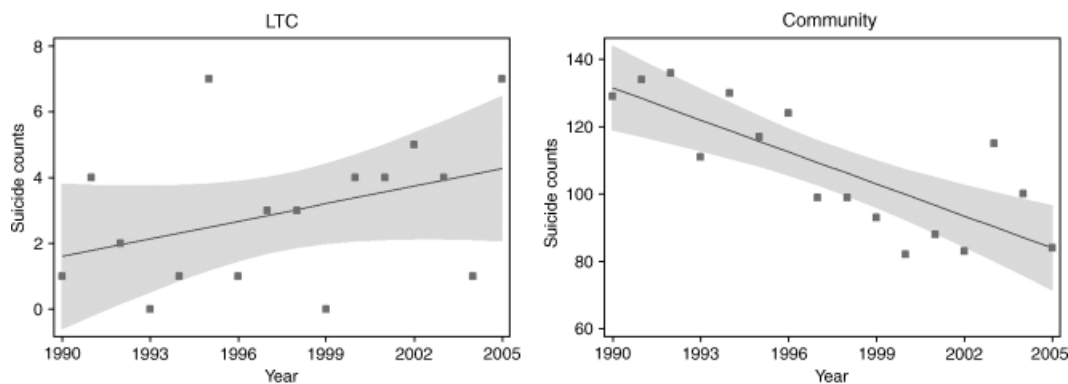


Figure 1. Suicide counts among older adults in community and long-term care settings, 1990 to 2005. Scatterplot and overlaid fitted linear regression with 95% confidence intervals of suicide counts in long-term care (LTC) and community settings for New York City residents age 60 and up. Test for differing trends over time by setting Cochran-Mantel-Haenszel $\chi^2 = 7.74$, $df = 1$, $P < .005$.

a long fall, not firearms, was the most frequently used method of the community-living adults, which may be reflective of the urban environment where the decedents lived.¹⁴

The findings of this study should be interpreted in light of several limitations. Foremost, information was available only on completed suicide, not attempts or ideation, and previous studies have suggested that persons who complete suicide have different demographic characteristics (i.e., women are more likely to attempt than men) than either of these groups.¹⁵ Although medical examiner data are highly accurate for violent deaths, with sensitivities of more than 95% for homicide and suicide,¹⁶ some types of suicide may be more prone to underdetection by the OCME (i.e., self-starvation), and as a result, misclassification of some cases may have occurred. Also, given the source of the data (e.g., counts of suicide cases), rates of suicide could not be calculated, only rate ratios, in the different settings. However, because suicide is such a rare event, studies of its occurrence in a defined population tend to yield small numbers of cases and thus have limited ability to draw statistical inferences, a limitation that was overcome with the relatively large number of cases described here. Another limitation of the data was that it was not possible to review more qualitative aspects of the individual's death such as suicide notes, police reports, and personal and psychiatric histories that would have allowed details of any individual's experience, such as, whether the suicidal act was premeditated or impulsive, to be studied directly. This study could not address the role of many factors that potentially influenced suicide risk over the study period, such as the increased use of antidepressants,¹⁷ although there is evidence that use of these medications, particularly selective serotonin reuptake inhibitors, may reduce suicidal ideation in older adults.^{18,19} Finally, given the population source, the results may not be generalizable to rural or suburban settings.

Implications for Prevention

It has been suggested that LTC facilities may protect persons from committing suicide because of the limited opportunities to perform the act because of high surveillance, less access to lethal means (i.e., firearms), greater burden of impairments that may impinge on the ability to execute a plan, and greater opportunity for healthcare providers to inquire about and intervene in the event of suicidal ideations.⁸ However, studies of predictors of nursing home admission suggest that older adults who reside in LTC have many of the characteristics associated with greater suicide risk, including low social support²⁰ and depression.²¹ Dementia is the most prominent risk factor for admission to LTC,²⁰ and cognitive impairment has been associated with suicidal ideation.²² Also, anticipation of placement in LTC has been identified as a potential risk factor for suicide in older adults.²³ Together these findings suggest that placement in LTC may be an indicator of an accumulation of risk for suicide.

Future research should focus on identifying methods to reduce suicide risk in LTC residents. For example, the finding that suicide in LTC was less likely to be due to firearms and more likely to be due to a long fall suggests that suicide in LTC settings may be reduced by limiting resident access

to high places, such as open windows and roofs, or using window guards. Also, LTC residents should be routinely screened and periodically reassessed for psychiatric disorders that are associated with suicide risk, such as depression and dementia, and appropriately treated. Despite the availability of alternatives to LTC placement, nursing home admissions did not decrease during the 1990s,²⁴ suggesting that the issue of suicide in LTC will persist as the population ages. A previous study identified four factors related to suicidal behavior in LTC (staff turnover, number of residents, cost, and sponsorship (i.e., public vs private)),²⁵ and although the effect of those factors could not be evaluated in the current study, it is important for policy-makers and healthcare providers to recognize that suicide risk in LTC is modifiable, and efforts should be made to improve the outcomes of older adults in these facilities.

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