Table A. Comparison of suicide decedents in long-term care versus community settings: Virginia 2003 – 2011

|  |  |  |  |
| --- | --- | --- | --- |
|  | Nursing home or Assisted living | Community | p-value |
|  | N (%) | N (%) |  |
| Number of suicides | 51 | 3,402 |  |
| Location of death |  |  |  |
| NH | 21 (41.2) |  |  |
| AL | 25 (49.0) |  |  |
| Unknown type but matched to a facility\* | 5 (9.8) |  |  |
| Age (mean, SD) | 78.6 (11.4) | 63.3 (10.9) | <0.001 |
| Female | 14 (27.5) | 736 (21.6) | 0.307 |
| White race | 48 (94.1) | 3121 (91.7) | 0.796 |
| Manner of injury |  |  |  |
| Firearm | 13 (25.5) | 2261 (66.5) | <0.001 |
| Hanging/suffocation | 13 (25.5) | 404 (11.9) |
| Poisoning | 5 (9.8) | 525 (15.4) |
| Cutting | 6 (11.8) | 61 (1.8) |
| Fall | 10 (19.6) | 44 (1.3) |
| Other/unknown | <5 | 107 (3.2) |
| Mental and physical health |  |  |  |
| Depressed mood | 20 (39.2) | 1358 (39.9) | 0.999 |
| Mental health problem | 31 (61.8) | 1812 (53.3) | 0.323 |
| Receiving psychiatric treatment | 29 (56.9) | 1289 (37.9) | 0.008 |
| Alcohol or substance use problem | <5 | 668 (19.6) | 0.002 |
| Physical health problem | 17 (33.3) | 1166 (34.3) | 0.999 |
| History of suicide attempts | 13 (25.5) | 471 (13.8) | 0.024 |
| Disclosed suicidal ideation | 16 (31.4) | 1207 (35.5) | 0.658 |
| Social context |  |  |  |
| Problems with family, finances, or spouse | 7 (13.7) | 1033 (30.4) | 0.009 |
| Crisis in past 2 weeks | 6 (11.8) | 901 (26.5) | 0.016 |
| P-value from Fisher’s exact test for categorical variables and Wilcoxon rank sum test for continuous variables.\*Unknown type facilities represent address matches to facilities that were no longer operational at the time of the data merger, but through record searches were determined to be long-term care facilities in the past. |

Table B. Comparison of suicide decedents in nursing homes versus assisted living facilities: Virginia 2003 – 2011

|  |  |  |  |
| --- | --- | --- | --- |
|  | Nursing home | Assisted Living | p-value |
|  | N (%) | N (%) |  |
| Number of suicide deaths | 21 | 25 |  |
| Age (mean, SD) | 82.3 (9.2) | 76.0 (12.5) | 0.067 |
| Female | 7 (33.3) | 6 (24.0) | 0.527 |
| White race | 20 (95.2) | 25 (100.0) | 0.457 |
| Manner of injury |  |  |  |
| Firearm | 7 (33.3) | 5 (20.0) | 0.574 |
| Hanging/suffocation | 5 (23.8) | 7 (28.0) |
| Poisoning | <5 | <5 |
| Cutting | <5 | <5 |
| Fall | 5 (23.8) | <5 |
| Other/unknown | <5 | <5 |
| Mental and physical health |  |  |  |
| Depressed mood | 8 (38.1) | 9 (36.0) | 1.0 |
| Mental health problem | 11 (52.4) | 16 (64.0) | 0.550 |
| Receiving psychiatric treatment | 10 (47.6) | 15 (60.0) | 0.553 |
| Alcohol or substance use problem | <5 | <5 | 1.0 |
| Physical health problem | 7 (33.3) | 7 (28.0) | 0.755 |
| History of suicide attempts | <5 | 8 (32.0) | 0.188 |
| Disclosed suicidal ideation | 7 (33.3) | 7 (28.0) | 0.755 |
| Social context |  |  |  |
| Problems with family, finances, or spouse | <5 | 6 (24.0) | 0.106 |
| Crisis in past 2 weeks | <5 | <5 | 1.0 |
| P-value from Fisher’s exact test for categorical variables and Wilcoxon rank sum test for continuous variables. |

Table C. Individual-level correlates of suicide in long-term care vs. community settings: Virginia 2003 – 2011

|  |  |  |
| --- | --- | --- |
|  | Crude | Adjusted |
|  | Odds Ratio(95% Confidence Interval) | Odds Ratio(95% Confidence Interval) |
| Age | 1.12 (1.09 – 1.15) | -- |
| Female gender *(ref. Male)* | 1.37 (0.74 – 2.55) | -- |
| Non-white race *(ref. White)* | 0.69 (0.21 – 2.24) | -- |
| Currently receiving psychiatric treatment *(ref. No)* | 2.16 (1.24 – 3.78) | 3.81 (2.06 – 7.02) |
| Current mental health problem *(ref. No)* | 1.36 (0.77 – 2.40) | 2.21 (1.21 – 4.05) |
| Current depressed mood *(ref. No)* | 0.97 (0.55 – 1.71) | 0.95 (0.53 – 1.69) |
| Contributing physical health problem *(ref. No)* | 0.96 (0.53 – 1.72) | 0.41 (0.22 – 0.77) |
| History of suicide attempts *(ref. No)* | 2.13 (1.13 – 4.03) | 4.02 (1.92 – 8.40) |
| Disclosed ideation *(ref. No)* | 0.83 (0.46 – 1.51) | 0.83 (0.45 – 1.52) |
| Recent crisis *(ref. No)* | 0.37 (0.16 – 0.87) | 0.48 (0.20 – 1.14) |
| Problems with family, finances, or spouse *(ref. No)* | 0.36 (0.16 – 0.81) | 0.92 (0.40 – 2.14) |
| N | 3,453 | 3,453 |
| Models adjusted for age, gender, and race. |

Table D. Characteristics of long-term care facilities with and without a suicide decedent: Virginia 2003 - 2011

|  |  |  |  |
| --- | --- | --- | --- |
|  | Facility with decedent | Facility without decedent | p-value |
| **Nursing homes** |  |  |  |
| N facilities | 16 | 268 |  |
| N suicides | 21 |  |  |
| Number of beds (M, SD) | 103.9 (85.5) | 113 (57.1) | 0.266 |
| Ownership (N, %) |  |  |  |
| For-profit | 7 (43.8) | 188 (70.2) | 0.055 |
| Non-profit | 7 (43.8) | 61 (22.8) |
| Religious | 0 | 9 (3.4) |
| Government | 2 (12.5) | 10 (3.7) |
| Part of a CCRC (N, %) | 8 (50.0) | 26 (9.7) | 0.001 |
| Family/residents council (N, %) |  |  |  |
| None | 1 (6.3) | 9 (3.4) | 0.515 |
| Resident or family council | 10 (62.5) | 181 (67.8) |
| Both family & resident council | 5 (31.3) | 77 (28.8) |
| General quality ratings (range 1 – 5) |  |  |  |
| Overall rating (M, SD) | 4.1 (1.1) | 3.1 (1.4) | 0.006 |
| Health rating (M, SD) | 3.5 (1.2) | 2.8 (1.3) | 0.024 |
| Staff rating (M, SD) | 4.0 (1.1) | 3.0 (1.2) | 0.002 |
| Quality rating (M, SD) | 4.1 (1.1) | 3.8 (1.1) | 0.097 |
| Specific quality measures for long-stay residents (M, SD) |  |  |  |
| Proportion in moderate/severe pain | 8.6 (5.6) | 10.7 (7.8) | 0.491 |
| Proportion receiving anti-psychotic medication | 22.9 (12.4) | 22.6 (8.9) | 0.627 |
| Proportion physically restrained | 0.5 (1.5) | 1.3 (5.5) | 0.137 |
| Proportion with depressed mood | 8.6 (2.6) | 4.6 (5.9) | 0.093 |
| Proportion experienced ≥1 falls | 3.2 (2.3) | 3.2 (2.2) | 0.872 |
| **Assisted living facilities** |  |  |  |
| N facilities | 24 | 524 |  |
| N suicides | 25 |  |  |
| Bed size (M, SD) | 105.4 (62.8) | 57.1 (53.8) | <0.001 |
| Type of care provided |  |  |  |
| Non-ambulatory | 20 (83.3) | 367 (70.7) | 0.133 |
| Ambulatory | 4 (16.7) | 152 (29.3) |
| License type (N, %) |  |  |  |
| Provisional | 1 (5.9) | 21 (5.0) | 0.923 |
| 1 year | 8 (47.1) | 200 (47.7) |
| 2 – 3 years | 8 (47.1) | 198 (47.3) |
| Number of inspection violations (M, SD) | 43.5 (39.0) | 62.3 (52.4) | 0.090 |
| Inspection prompted by complaint-related (N, %) | 14 (82.4) | 272 (64.9) | 0.107 |
| P-value from Fisher’s exact test for categorical variables and Wilcoxon rank sum test for continuous variables.*Note on missing data:* General quality ratings (NNH=284); Quality measures for long-stay residents (NNH =278); Inspections promoted by complaint and number of inspection violations (NAL=437); Type of care (NAL =544); License type (NAL =437). |

Table E. Select characteristics of nursing homes with zero, one, and more than one suicide decedent

|  |  |  |  |
| --- | --- | --- | --- |
|  | No suicide decedents | One suicide decedent | More than one suicide decedent |
| N facilities | 269 | 12 | 4 |
| N suicides | -- | 12 | 9 |
| Bed size (M, SD) | 113.4 (57.0) | 86.8 (51.5) | 155.5 (148.6) |
| OwnershipFor-profitNon-profitReligious/Government | 188 (69.9)61 (22.7)20 (7.4) | 5 (41.7)5 (41.7)2 (16.7) | 2 (50.0)2 (50.0)-- |
| Overall facility rating | 3.1 (1.4) | 4.0 (1.2) | 4.3 (1.0) |
| Health rating | 2.8 (1.3) | 3.5 (1.2) | 3.5 (1.3) |
| Staffing rating | 3.0 (1.2) | 4.1 (1.0) | 3.8 (1.3) |
| Quality rating | 3.8 (1.0) | 4.0 (1.3) | 4.5 (0.6) |

Table F. Cumulative incidence of suicide in nursing homes under different scenarios of population at risk: 2006 - 2011

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Year | 2011 | 2010 | 2009 | 2008 | 2007 | 2006 |
| Total NH census  | 29,606 | 50,801 | 48,248 | 47,870 | 45,375 | 44,865 |
| 85% age 65+ | 25165 | 43181 | 41011 | 40690 | 38569 | 38135 |
| 80% age 65+ | 23685 | 40641 | 38598 | 38296 | 36300 | 35892 |
| 90% age 65+ | 26645 | 45721 | 43,423 | 43083 | 40838 | 40379 |
| Number of suicides in NH aged 65+ | 4 | 8 | 5 | 5 | 5 | 5 |
| Incidence in NH (85% age 65+) | 15.90 per 100,000 | 18.53 per 100,000 | 12.19 per 100,000 | 12.29 per 100,000 | 12.96 per 100,000 | 13.11 per 100,000 |
| Incidence in NH (80% age 65+) | 16.89 per 100,000 | 19.68 per 100,000 | 12.95 per 100,000 | 13.06 per 100,000 | 13.77 per 100,000 | 13.93 per 100,000 |
| Incidence in NH (90% aged 65+) | 15.01 per 100,000 | 17.50 per 100,000 | 11.51 per 100,000 | 11.61 per 100,000 | 12.24 per 100,000 | 12.38 per 100,000 |
| Note: Total NH census derived from the Nursing Home Compendium for each year. |

Figure A. Illustration of location matching for quantitative analysis

Deaths that occurred in the community

Number of suicides=3,402

Number of undetermined deaths=221

Deaths that occurred in long-term care

Number of suicides=51

Number of undetermined deaths=8

\*Unknown type facilities represent address matches to a long-term care facility that was no longer operational at the time of the Virginia Department of Social Services or Nursing Home Compare data download, but through public record searches was determined to be a long-term care facility in the past.

Decedent residence or place of death did **not** match to an AL or NH

Number of deaths=3,623

Decedent residence or place of death **matched** to an AL or NH

Number of deaths=59

Number of deaths matched to a long-term care facility in either database=52

Number of deaths matched to an unknown\* long-term care facility=7

Number of unique facilities in which a death (suicide or undetermined) occurred=46

Fine-grained Record Integration Linkage

Nursing Home Compare

Addresses of Medicare/Medicaid Certified Nursing Homes (NH)

Number of facilities=285

Virginia Department of Social Services

Addresses of Assisted Living (AL) Facilities

Number of facilities=548

VA VDRS 2003 – 2011

Addresses of suicides and undetermined deaths among adults aged 50+

Number of decedents=3,682

Figure B. Number of suicides in long-term care and community settings among adults aged 50 and older: Virginia 2003 – 2011



Number of suicides

Caption for Supplemental Figure 2. Number of suicides that matched to a nursing home or assisted-living facility (see Figure A) by year. Virginia Violent Death Reporting System 2003 – 2011. Decedents identified by narratives only are not included in these plots.

Figure C. Cumulative incidence of suicide in nursing homes among adults aged 65 and older: Virginia 2006 – 2011



Figure 1 Legend. Cumulative incidence estimated assuming 85% of nursing home residents are aged 65 and older, consistent with Nursing Home Compendium estimates. See Table F for additional estimates under other scenarios of age composition of residents.