



National End of Life Care Programme Improving end of life care





# Deaths from Alzheimer's disease, dementia and senility in England November 2010







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## 1 Introduction

This report will be an invaluable resource to policy makers, providers and commissioners of care for the elderly and patients with Alzheimer's disease, dementia and senility, and to the non-statutory bodies who support them and their carers.

Dementia is a syndrome due to disease of the brain, usually of a chronic or progressive nature, in which there is disturbance of multiple higher cortical functions, including memory, thinking, orientation, comprehension, calculation, learning capacity, language and judgement. Consciousness is not clouded. The impairments of cognitive functions are commonly accompanied, and occasionally preceded, by deterioration in emotional control, social behaviour, or motivation. This syndrome occurs in Alzheimer's disease, in cerebrovascular disease, and in other conditions primarily and secondarily affecting the brain. (Source: ICD-10)

Ageing has a close link to the development of dementia and cognitive impairment. The longer we live, the more likely we are to suffer from these conditions. Numerous estimates of dementia prevalence exist, based upon a range of studies of varying reliability. In 2007, the Alzheimer's Society produced a report titled *Dementia UK – The full report*, which contained prevalence estimates for both early and late onset dementia based on a systematic review of research data (see Appendix, Table A1 for detailed breakdowns by age and sex). Late onset dementia prevalence was estimated to increase consistently from 1.3% for persons aged 65–69 up to 32.5% for persons aged 95+. A study funded by the Medical Research Council and published in 2006 gave higher estimates of the prevalence of dementia based on clinical assessment. It showed that the overall prevalence of dementia at death was 30% in people aged 65 and over but that the prevalence increased with age from 6% for those aged 65–69 years at death to 58% for those aged 95 and over at death (Brayne C et al, 2006). The same report showed that there was even higher prevalence for severe cognitive impairment.

The recent report *Deaths in Older Adults in England*, published by the National End of Life Care Intelligence Network (October 2010, see <u>www.endoflifecare-intelligence.org.uk</u>), showed that two-thirds (66.8%) of all deaths occur in people aged 75 and over. In males this figure is 58.4% and in females 74.4%. Even more striking is the fact that one in six deaths are in people aged 90 or over. *Deaths in Older Adults in England* also identified that dementia and/or senility appear in the top ten causes of deaths for males and females in five-year age groups from 80–84 years and upwards. The number of people aged 75 and over in England is projected to increase from 4.0 million to 7.2 million by 2033 and of those aged 90 and over from 0.4 million to 1.2 million. This increase in the older population is predicted to be accompanied by a large increase the prevalence of people with dementia.

Applying the prevalence figures from *Dementia UK* – *The full report* to the mid-2010 Office for National Statistics (ONS) population projection for England results in an estimate of 613,661 persons with dementia, a population prevalence of 1.2%. Applying the prevalence figures to the mid-2030 population projection for England results in an estimated 1,054,621 people with dementia, a population prevalence of 1.8%. Therefore, if the age-specific prevalence of dementia remains unchanged, between 2010 and 2030 there will be an increase of 440,960 (72%) in the number of people estimated to have dementia, purely due to demographic change in the size and age structure of the population of England.

Place of death is an important determinant of the quality of a person's death. The place where someone dies is influenced by the nature of their final condition and its complications, their age and personal care circumstances. Care homes, both nursing and old people's homes, play a critical role in the end of life care of older adults. The report *Deaths in Older Adults in England* showed that over 22% of deaths in people aged 75 and over were in care homes but that this increased with age to around 37% for those aged 90 or over. Many older people with dementia and severe cognitive impairment are cared for in nursing or old people's homes.

For these reasons we were commissioned to produce this report by the National End of Life Care Intelligence Network and in particular to examine place of death for people for whom Alzheimer's disease, dementia and senility were recorded on the death certificate. The analyses, which examine numbers, age and gender profiles, and place of death, use mortality data compiled by the ONS, based on death registrations for which Alzheimer's disease, dementia and senility were recorded either as the 'underlying' cause of death or as a 'contributory' cause. The analyses are based on deaths in people who were usually resident in England and who died between 2001 and 2009. Full details are listed in the 'Methods' section below.

The analyses were conducted cognisant of previous research which showed that less than 25% of people diagnosed with dementia during their life had their diagnosis recorded as the underlying cause of death on the death certificate (Martyn and Pippard 1998).

#### 1.1 Definitions and caveats

Several terms are used throughout this report relating to occurrence of death from Alzheimer's disease, dementia and senility. These are;

Underlying cause of death, defined as:

- i) the disease or injury that initiated the train of events directly linked to death; or
- ii) the circumstances of the accident or violence that produced the fatal injury.

**Contributory cause of death,** defined as: part of the causal sequence of events leading to death, or contributing to the death but not part of the causal sequence.

**Mention**, defined as: a death which has a condition listed as either the underlying cause of death or as a contributory cause of death.

It is worth noting that, according to the 'rules' concerning the recording of deaths, people who die from a completely unrelated cause, perhaps a road accident, will not have Alzheimer's disease, dementia or senility recorded as either an '**underlying**' or '**contributory**' cause of death. Consequently, the numbers of deaths referred to in this document are not a true measure of the numbers of people 'who die and who have' these conditions, nor are the numbers shown a measure of either incidence (numbers of people newly diagnosed with these conditions) or prevalence (numbers of people living with these conditions). However, the inclusion of Alzheimer's disease, dementia and senility gives a clear indication of the numbers of people dying where these diseases are a direct or important factor in those deaths.

Most of the tables and charts in this document show the source of the information as the Office for National Statistics, which reflects the original data source. All analyses, tables and charts have been produced by the South West Public Health Observatory.

## 2 Methods

In this report analyses are based on deaths of people who were usually resident in England and who died with Alzheimer's disease, dementia or senility recorded on their death certificates. The trend analyses are based on deaths registered in the years 2001 to 2009, while the demographic profiles and cause of death analyses are based on deaths registered over the more recent period of 2007 to 2009. The specific conditions were selected using the following ICD-10 codes (International Statistical Classification of Diseases and Related Health Problems version 10) as shown in the table below.

| Cause of death  | ICD 10 codes             |
|---|--------------------------|
| Dementia (includes vascular and unspecified dementia) | F01, F03 (any 4th digit) |
| Alzheimer's disease                                   | G30 (any 4th digit)      |
| Senility (without mention of psychosis)               | R54 (any 4th digit)      |

Mortality records were included where:

- one or more of the diagnosis codes listed above were mentioned in any of the cause of death fields (i.e. the underlying cause of death field, secondary cause of death field or any of the 15 secondary cause of death fields); and
- the usual place of residence of the deceased was in England, identified using the Government Office Region (place of residence) codes 'A','B','D','E','F','G','H','J','K'; and
- a contributory cause of death code was defined as any one of the above selected conditions appearing in the non-underlying cause of death fields (i.e. any of the 15 secondary cause of death fields). If an individual had both an underlying and a contributory cause coding for a specific diagnosis (i.e. Alzheimer's disease, dementia or senility), the underlying coding only was used in the following analyses.

## 3 Results

#### 3.1 Overview

Between 2001 and 2009, there were 631,078 deaths for which one or more of the conditions Alzheimer's disease, dementia or senility were mentioned on death certificates. This represents approximately 15% of all deaths (4,339,000) recorded in England over the same period. 70,365 (11%) people had more than one of these conditions recorded as implicated in their death.

A significant proportion of people who died from an underlying cause of Alzheimer's disease, dementia or senility also had one or more of these conditions coded as a contributory cause, as shown in Table 1.

|                        | Underlying | Contributory coding |                        |          |         |  |  |  |  |  |
|------------------------|------------|---------------------|------------------------|----------|---------|--|--|--|--|--|
| Cause of death         | coding     | Dementia            | Alzheimer's<br>disease | Senility | Total   |  |  |  |  |  |
| Dementia               | 117,582    | х                   | 88                     | 35,302   | 35,390  |  |  |  |  |  |
| Alzheimer's<br>disease | 43,940     | 1,914               | х                      | 8,926    | 10,840  |  |  |  |  |  |
| Senility               | 86,047     | 3                   | 0                      | х        | 3       |  |  |  |  |  |
| All other              | 4,091,673  | 165,735             | 23,248                 | 218,740  | 407,723 |  |  |  |  |  |
| Total                  | 4,339,242  | 167,652             | 23,336                 | 262,968  | 453,956 |  |  |  |  |  |

Table 1: Underlying and contributory cause of death coding combinations, England, 2001 to 2009

Source: Office for National Statistics, annual mortality extracts

- 30% of persons with an underlying death code of dementia also had a contributory code of senility.
- 20% of persons with an underlying code of Alzheimer's disease also had a contributory code of senility, while a further 4% also had a contributory code of dementia.
- Approximately 10% of all deaths with an underlying cause of death other than Alzheimer's disease, dementia or senility, had one of these conditions coded as a contributory cause of death.

## 3.2 Alzheimer's disease, dementia and senility as underlying causes of death

Table 2 and Figure 1 show how often Alzheimer's disease, dementia or senility was recorded as the underlying cause of death. Of the 631,078 people who died with a mention of one or more of these conditions between 2001 and 2009, 247,569 (39%) had Alzheimer's disease, dementia or senility coded as the underlying cause of death, compared with 383,509 (61%) people with these conditions coded as contributory causes of death. People dying with Alzheimer's disease, dementia or senility recorded as either an underlying or contributory cause of death are likely to have specific end of life care needs related to these conditions.

|                        | 2001   | 2002   | 2003   | 2004   | 2005   | 2006   | 2007   | 2008   | 2009   | Total   |
|------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| Dementia               | 11,696 | 11,970 | 12,543 | 11,940 | 12,104 | 12,451 | 13,955 | 15,564 | 15,359 | 117,582 |
| Alzheimer's<br>disease | 4,170  | 4,449  | 4,682  | 4,463  | 4,544  | 4,578  | 5,347  | 5,890  | 5,817  | 43,940  |
| Senility               | 11,343 | 11,211 | 10,899 | 9,430  | 9,308  | 8,770  | 8,855  | 8,969  | 7,262  | 86,047  |
| Total                  | 27,209 | 27,630 | 28,124 | 25,833 | 25,956 | 25,799 | 28,157 | 30,423 | 28,438 | 247,569 |

Table 2: Alzheimer's disease, dementia and senility as underlying causes of death, England, 2001 to 2009

*Figure 1: Trends in Alzheimer's disease, dementia and senility as underlying causes of death, England, 2001 to 2009* 



Source: Office for National Statistics, annual mortality extracts

- The most common underlying cause of death was dementia, accounting for 117,852 (47%) of the considered conditions. There were 86,047 (35%) deaths with senility as the underlying cause, and 43,940 (18%) deaths with Alzheimer's disease as the underlying cause.
- The total numbers of people dying from underlying causes of senility, dementia and Alzheimer's disease increased slightly between 2001 and 2008, but fell in 2009.
- There was a steady decline in numbers of people dying with senility as the underlying cause from 11,343 in 2001 to 7,262 in 2008 (36% decrease).
- There was a continual rise in the numbers of people dying with dementia as the underlying cause from 11,696 in 2001 to 15,564 in 2008 (33% increase). Numbers fell slightly in 2009.
- There was also a gradual rise in the total numbers of people dying with Alzheimer's disease as the underlying cause from 4,170 in 2001 to 5,890 in 2008 (41% increase). Numbers fell slightly in 2009.

## 3.3 Alzheimer's disease, dementia and senility as contributory causes of death

Table 3 shows that there were 453,956 contributory cause of death codings for Alzheimer's disease, dementia and senility between 2001 and 2009.

Table 3: Alzheimer's disease, dementia and senility as contributory causes of death, England, 2001 to 2009

|                     | 2001   | 2002   | 2003   | 2004   | 2005   | 2006   | 2007   | 2008   | 2009   | Total   |
|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| Dementia            | 13,784 | 15,267 | 16,581 | 16,463 | 17,570 | 18,749 | 21,091 | 23,435 | 24,712 | 167,652 |
| Alzheimer's disease | 2,125  | 2,284  | 2,552  | 2,340  | 2,520  | 2,689  | 2,864  | 2,911  | 3,051  | 23,336  |
| Senility            | 26,459 | 27,440 | 28,670 | 27,425 | 28,707 | 29,009 | 31,055 | 32,838 | 31,365 | 262,968 |
| Total               | 42,368 | 44,991 | 47,803 | 46,228 | 48,797 | 50,447 | 55,010 | 59,184 | 59,128 | 453,956 |

Source: Office for National Statistics, annual mortality extracts





- Approximately twice as many deaths were recorded as contributory as underlying.
- The most common contributory cause of death was senility, accounting for 262,968 (58%) of all deaths in which one of the selected conditions was mentioned. Senility was recorded as a contributory cause more than three times as frequently as it was an underlying cause.
- There were 167,652 (37%) deaths with dementia as a contributory cause, and 23,336 (5%) deaths with Alzheimer's disease as a contributory cause.
- The total numbers of people dying with contributory causes of senility, dementia and Alzheimer's disease increased steadily from 2001 to 2008, but fell marginally in 2009.
- There was a gradual rise in the numbers of people dying with senility as a contributory cause from 26,459 in 2001 to 32,838 in 2008 (24% increase). There was a slight reduction between 2008 and 2009.

- There was a more pronounced rise in the numbers of people dying with dementia as a contributory cause from 13,784 in 2001 to 24,712 in 2009 (79% increase).
- There was also a gradual rise in the numbers of people dying with Alzheimer's disease as a contributory cause from 2,125 in 2001 to 3,051 in 2009 (44% increase).

#### 3.4 Mentions of deaths for Alzheimer's disease, dementia and senility

Table 4 shows that there were 701,525 mentions of death (i.e. underlying deaths + contributory deaths) for Alzheimer's disease, dementia and senility between 2001 and 2009.

|                        | 2001   | 2002   | 2003   | 2004   | 2005   | 2006   | 2007   | 2008   | 2009   | Total   |
|------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| Dementia               | 25,480 | 27,237 | 29,124 | 28,403 | 29,674 | 31,200 | 35,046 | 38,999 | 40,071 | 285,234 |
| Alzheimer's<br>disease | 6,295  | 6,733  | 7,234  | 6,803  | 7,064  | 7,267  | 8,211  | 8,801  | 8,868  | 67,276  |
| Senility               | 37,802 | 38,651 | 39,569 | 36,855 | 38,015 | 37,779 | 39,910 | 41,807 | 38,627 | 349,015 |
| Total                  | 69,577 | 72,621 | 75,927 | 72,061 | 74,753 | 76,246 | 83,167 | 89,607 | 87,566 | 701,525 |

Table 4: Mentions of deaths for Alzheimer's disease, dementia and senility, England, 2001 to 2009





Source: Office for National Statistics, annual mortality extracts

- Between 2001 and 2008, the most common mention of death was senility, accounting for approximately 40% of all deaths in which one of the selected conditions was mentioned as underlying or contributory. In 2009, dementia overtook senility as the most common death mention.
- The total numbers of people dying with mentions of dementia and Alzheimer's disease increased steadily from 2001 to 2009. Mentions of senility remained steady.
- There was a consistent increase in the numbers of people dying with a mention of dementia from 25,480 in 2001 to 40,071 in 2009, a rise of 57%.

• There was also a steady rise in numbers of people dying with mention of Alzheimer's disease from 6,295 in 2001 to 8,868 in 2009, an increase of 41%.

Detailed tabulations of numbers of underlying and contributory deaths by year of registration and condition are presented in Appendix, Table A2.

## 3.5 Age and sex distributions of Alzheimer's disease, dementia and senility as underlying and contributory causes of death

Figures 4 to 6 show the age-sex distributions of Alzheimer's disease, dementia and senility as underlying and contributory causes of death registered between 2007 and 2009. Total numbers for males and females are also shown in the legends. Detailed tabulations by age and sex are presented in Appendix, Tables A3 and A4.

#### 3.5.1 Underlying and contributory numbers of deaths – dementia

Figure 4: Age and sex distribution of people who died with dementia recorded as either the underlying or contributory cause, England, 2007 to 2009



- 44,878 people died with dementia recorded as the underlying cause between 2007 and 2009. There were more females (32,027; 71%) than males (12,851; 29%).
- 69,238 people died with dementia as a contributory cause of death between 2007 and 2009. Again, there were more females (43,498; 63%) than males (25,740; 37%).
- For males, 33% of all deaths with a mention of dementia had dementia recorded as the underlying cause of death. For females, 42% of all dementia mentions were recorded as the underlying cause of death.
- Only 6% (6,604) of deaths with a mention of dementia died before age 75. 62% (71,132) of deaths were age 85 or over.

#### 3.5.2 Underlying and contributory numbers of deaths – Alzheimer's disease

Figure 5: Age and sex distribution of people who died with Alzheimer's disease recorded as either the underlying or contributory cause, England, 2007 to 2009



Source: Office for National Statistics, annual mortality extracts

- 17,054 people died with Alzheimer's disease recorded as the underlying cause between 2007 and 2009. There were more females (11,677; 68%) than males (5,377; 32%).
- 8,826 people died with Alzheimer's disease as a contributory cause of death between 2007 and 2009. Again, there were more females (5,481; 62%) than males (3,345; 38%).
- For males, 62% of all deaths with a mention of Alzheimer's disease had Alzheimer's disease recorded as the underlying cause of death. For females, 68% of all Alzheimer's disease mentions were recorded as the underlying cause of death.
- Only 9% (2,450) of deaths with a mention of Alzheimer's disease died before age 75. 53% (13,744) of deaths were age 85 or over.

#### 3.5.3 Underlying and contributory numbers of deaths – senility

Senility 95+ 90-94 85-89 80-84 75-79 70-74 65-69 60-64 55-59 Age group 50-54 45-49 40-44 35-39 30-34 25-29 20-24 15-19 10-14 5-9 0-4 5,000 10,000 15,000 20,000 25,000 30,000 35,000 15,000 10,000 5,000 0 Number of deaths (2007-2009) Males - Underlying (n=4,725) Males - Contributory (n=24,519) Females - Underlying (n=20,361) ■ Females - Contributory (n=70,739)

Figure 6: Age and sex distribution of people who died with senility recorded as either the underlying or contributory cause, England, 2007 to 2009

Source: Office for National Statistics, annual mortality extracts

- 25,086 people died with senility recorded as the underlying cause between 2007 and 2009. There were more females (20,361; 81%) than males (4,725; 19%).
- 95,258 people died with senility as a contributory cause of death between 2007 and 2009. Again, there were more females (70,739; 74%) than males (24,519; 26%).
- For males, 16% of all deaths with a mention of senility had senility recorded as the underlying cause of death. For females, 22% of all deaths with a mention of senility had senility recorded as the underlying cause of death.
- Less than 1% (529) of deaths with a mention of senility died before age 75. 86% (103,872) of deaths were age 85 or over.

#### 3.6 Place of death

Place of death is an important determinant of the quality of a person's death. The place where someone dies is influenced by the nature of their final condition and its complications, their age and personal care circumstances.

#### 3.6.1 By underlying cause of death

Table 5 shows the places of death for people who died with Alzheimer's disease, dementia or senility as the underlying cause for registration years 2007 to 2009.

Table 5: Alzheimer's disease, dementia and senility as underlying causes of death, by place of death, England, 2007 to 2009

|                        | Hospit | al | Old peop<br>home | ole's<br>e | Nursin<br>home | ig<br>è | Own<br>residen | ce | Hospic | e  | Elsewho | ere | Total  |     |
|------------------------|--------|----|------------------|------------|----------------|---------|----------------|----|--------|----|---------|-----|--------|-----|
|                        | n      | %  | n                | %          | n              | %       | n              | %  | n      | %  | n       | %   | n      | %   |
| Dementia               | 17,680 | 39 | 11,336           | 25         | 13,623         | 30      | 1,993          | 4  | 52     | <1 | 194     | <1  | 44,878 | 100 |
| Alzheimer's<br>disease | 5,734  | 34 | 4,650            | 27         | 5,357          | 31      | 1,192          | 7  | 41     | <1 | 78      | <1  | 17,052 | 100 |
| Senility               | 4,061  | 16 | 8,798            | 35         | 7,781          | 31      | 4,140          | 17 | 17     | <1 | 289     | 1   | 25,086 | 100 |
| Total                  | 27,475 | 32 | 24,784           | 28         | 26,761         | 31      | 7,325          | 8  | 110    | <1 | 561     | 1   | 87,016 | 100 |

- There is a very significant difference in the distribution of place of death for patients dying with Alzheimer's disease, dementia or senility as the underlying cause compared with the general population aged 75 and over. In the general population (aged 75 and over), 58.4% died in hospital compared with 32% for Alzheimer's disease, dementia or senility as a group (32%), or senility alone (16%). Similar contrasts are seen for deaths in old people's homes, where 10% of deaths occur for people aged 75 and over in the whole population compared with 28% for people with the conditions in this report, and 35% for those with senility alone. Also for deaths in nursing homes, where 12.1% of deaths occur for people aged 75 and over in the conditions in this report.
- The patterns of place of death for people dying from underlying causes of dementia and Alzheimer's disease are broadly similar. The largest percentages of deaths occur in hospital, followed by nursing homes and old people's homes. Relatively small percentages die in their own homes, in hospices, or elsewhere.
- In contrast, the most common place of death for people with senility as the underlying cause of death is old people's homes, followed by nursing homes and then hospitals. Deaths at home are more common than for those dying of dementia or Alzheimer's disease. Deaths within hospices or elsewhere are again uncommon.

#### 3.6.2 By contributory cause of death

Table 6 shows the places of occurrence of death for those people who died with Alzheimer's disease, dementia or senility recorded as a contributory cause for registration years 2007 to 2009.

Table 6: Alzheimer's disease, dementia or senility as contributory causes of death, by place of death, England, 2007 to 2009

|                        | Hospit | al | Old peop<br>home | ole's<br>e | Nursin<br>home | ig<br>è | Own<br>resider | ce | Hospice Elsewhere To |    | Elsewhere |    | Total   | l   |
|------------------------|--------|----|------------------|------------|----------------|---------|----------------|----|----------------------|----|-----------|----|---------|-----|
|                        | n      | %  | n                | %          | n              | %       | n              | %  | n                    | %  | n         | %  | n       | %   |
| Dementia               | 36,450 | 53 | 12,633           | 18         | 16,229         | 23      | 3,356          | 5  | 294                  | <1 | 276       | <1 | 69,238  | 100 |
| Alzheimer's<br>disease | 4,584  | 52 | 1,604            | 18         | 1,824          | 21      | 666            | 8  | 98                   | 1  | 50        | 1  | 8,826   | 100 |
| Senility               | 32,293 | 34 | 24,677           | 26         | 25,751         | 27      | 11,585         | 12 | 175                  | <1 | 777       | 1  | 95,258  | 100 |
| Total                  | 73,327 | 42 | 38,914           | 22         | 43,804         | 25      | 15,607         | 9  | 567                  | <1 | 1,103     | 1  | 173,322 | 100 |

- The proportions of patients dying in hospital was higher where Alzheimer's disease, dementia or senility were recorded as a contributory cause. This is to be expected, as for these patients the underlying cause may be a condition with an acute event which necessitates admission to hospital prior to death. However, it is also important to note, as is shown later in the report, that patients who died with an underlying cause of cardiovascular disease, cancer or respiratory disease and with Alzheimer's disease, dementia or senility recorded as a contributory cause were less likely to die in hospital than patients without Alzheimer's disease, dementia or senility recorded as a contributory cause.
- The patterns of place of death for people dying with contributory causes of dementia and Alzheimer's disease are again broadly similar. More than half of all deaths occurred in hospital, with sizeable proportions also dying in nursing homes and old people's homes. A smaller, but still significant, proportion of people died in their own homes, while deaths in hospices and elsewhere were relatively uncommon.
- In deaths with senility as a contributory cause, approximately one-third of people died in hospital, and a quarter each in old people's homes and nursing homes. Deaths at home were again more common than for those dying with dementia or Alzheimer's disease as contributory causes. Deaths within hospices or elsewhere are again uncommon.

#### 3.6.3 Underlying cause of death by age and sex

Figures 7 and 8 show the places of death for males and females aged 65 years and over who had an underlying cause of death coding for Alzheimer's disease, dementia or senility for registration years 2007 to 2009. Detailed tabulations of place of death by age and sex are presented in Appendix, Tables A5 and A6.





Source: Office for National Statistics, annual mortality extracts

- From age 75+ there was a continual decrease in the percentage of males dying in hospital, from 51% for age 75–79 to 25% for age 95+.
- There was a corresponding increase in the percentage of males dying in old people's homes, from 13% for age 65–69 to 33% for age 95+.
- The percentage of males dying in nursing homes was approximately constant (circa 30%) across the displayed age range.
- The percentage of males dying at home gradually increased from 8% at age 70–74 to 13% for age 95+.





Source: Office for National Statistics, annual mortality extracts

- From age 70+ there was a continual decrease in the percentage of females dying in hospital, from 41% for age 70–74 to 18% for age 95+.
- There was a corresponding increase in the percentage of females dying in old people's homes, from 18% for age 65–69 to 39% for age 95+.
- The percentage of females dying in nursing homes was approximately constant (circa 32%) across the displayed age range.
- The percentage of females dying at home gradually increased from 7% at age 70–74 to 10% for age 95+.
- Compared with males, females had a lower percentage of deaths in hospital and a higher percentage of deaths in nursing homes across all age groups. The percentages dying at home and in nursing homes was comparable for males and females.

#### 3.6.4 Contributory cause of death by age and sex

Figures 9 and 10 show the places of occurrence of death for males and females aged 65 years and over who had contributory cause of death codings for Alzheimer's disease, dementia or senility for registration years 2007 to 2009. Detailed tabulations of place of death by age and sex are presented in Appendix, Tables A7 and A8.





- There was a continual decrease in the percentage of males dying in hospital, from 61% for age 65–69 to 40% for age 95+.
- There was a corresponding increase in the percentage of males dying in old people's homes, from 10% for age 65–69 to 24% for age 95+.
- The percentage of males dying in nursing homes varied little across the displayed age range, averaging around 22%.
- The percentage of males dying at home gradually increased from 6% at age 70–74 to 12% for age 95+.

Figure 10: Place of death distribution for females aged 65+ with contributory cause codings of Alzheimer's disease, dementia or senility, England, 2007 to 2009



Source: Office for National Statistics, annual mortality extracts

- From age 65+ there was a continual decrease in the percentage of females dying in hospital, from 57% for age 65–69 to 31% for age 95+.
- There was a corresponding increase in the percentage of females dying in old people's homes, from 11% for age 65–69 to 33% for age 95+.
- The percentage of females dying in nursing homes varied little across the displayed age range, averaging around 25%.
- The percentage of females dying at home also varied little across the displayed age range, averaging around 8%.
- Compared with males, females had a lower percentage of deaths in hospital and a higher percentage of deaths in nursing homes across all age groups. Slightly more females than males died in nursing homes, while slightly fewer females died at home.

#### 3.7 Alzheimer's disease, dementia and senility contributory cause codings in major mortality groups

#### 3.7.1 Circulatory diseases

Circulatory diseases occupy codes I00 to I99 in the ICD10 coding system, and include some of the most common causes of death, including ischaemic heart diseases (I20–I25) and cerebrovascular diseases (I60–I69). In 2008 there were 156,787 deaths from circulatory diseases, representing 33% of all deaths in 2008.

Figure 11 shows the age-sex distribution of deaths with underlying cause of death of circulatory disease, with and without contributory Alzheimer's disease, dementia or senility coding, for registration years 2007 to 2009. Total numbers for males and females are also shown in the legend.

Figure 11: Age and sex distribution of people who died with circulatory disease as the underlying cause of death, with and without Alzheimer's disease, dementia and senility contributory cause codings, England, 2007 to 2009



Source: Office for National Statistics, annual mortality extracts

- 464,350 people died with a circulatory disease recorded as the underlying cause of death between 2007 and 2009. 64,876 (14%) of these deaths also had a contributory cause coding for Alzheimer's disease, dementia or senility.
- A higher percentage of females (19%) than males (9%) had a contributory cause of death coding for one of the selected conditions.

Figure 12 shows the places of occurrence of death for males and females aged 65 years and over who had a circulatory disease as the underlying cause of death, with and without contributory codings for Alzheimer's disease, dementia or senility, for registration years 2007 to 2009.

Figure 12: Place of death distribution for males and females aged 65+ with circulatory diseases as the underlying cause of death, with and without contributory cause codings for Alzheimer's disease, dementia or senility, England, 2007 to 2009



Source: Office for National Statistics, annual mortality extracts

- For both males and females with underlying cause of death of circulatory disease, there were considerable differences in distribution of place of death, according to whether Alzheimer's disease, dementia or senility were identified as contributory causes of death.
- Where the selected conditions were not contributory, the majority of both males and females aged 65+ died in hospital. With increasing age, larger proportions of both males and females died in old people's homes and nursing homes, and fewer died in their own residences.
- Where the selected conditions were contributory, a smaller proportion of both males and females died in hospital, and this progressively fell with increasing age. The proportions dying in nursing homes and old people's homes were considerable larger and, in the case of old people's homes, increased with age. Deaths in own residences were less common and varied little with age.

#### 3.7.2 Malignant cancers

Malignant cancers occupy codes C00 to C97 in the ICD-10 coding system. Major causes of death within this broad category include lung cancer (C33–C34), colorectal cancer (C18–C21), breast cancer (C50) and prostate cancer (C61). In 2008 there were 128,802 deaths from malignant cancers, representing 27% of all deaths in 2008.

Figure 13 shows the age-sex distribution of deaths with underlying cause of death of malignant cancer, with and without contributory cause of death codings for Alzheimer's disease, dementia and senility, for registration years 2007 to 2009. Total numbers for males and females are also shown in the legend.

Figure 13: Age and sex distribution of people who died with malignant cancer as the underlying cause of death, with and without Alzheimer's disease, dementia and senility contributory cause codings, England, 2007 to 2009.



Source: Office for National Statistics, annual mortality extracts

- 385,068 people died with a malignant cancer recorded as the underlying cause of death between 2007 and 2009. 12,228 (3%) of these deaths also had Alzheimer's disease, dementia or senility coded as a contributory cause.
- A higher percentage of females (4%) than males (2%) had one or more of the selected conditions coded as a contributory cause of death.
- The lower proportion of Alzheimer's disease, dementia or senility listed as a contributory causes for people dying of cancer is probably due to the slightly younger age profile at death for cancer patients.

Figure 14 shows the places of occurrence of death for males and females aged 65 years and over who had a malignant cancer as the underlying cause of death, with and without contributory cause of death coding for Alzheimer's disease, dementia or senility, for registration years 2007 to 2009.

Figure 14: Place of death distribution for males and females aged 65+ with malignant cancers as the underlying cause of death, with and without contributory cause codings for Alzheimer's disease, dementia or senility, England, 2007 to 2009



Source: Office for National Statistics, annual mortality extracts

- For both males and females with underlying cause of death of malignant cancer, there were considerable differences in distribution of place of death, according to whether Alzheimer's disease, dementia or senility were identified as contributory.
- Where the selected conditions were not contributory, approximately 40% to 50% of persons aged 65+ died in hospital. With increasing age, larger proportions of both males and females died in old people's homes and nursing homes, and fewer died in their own residences. A significant proportion also died in hospices, though this proportion also fell with increasing age.
- Where the selected conditions were contributory, a smaller proportion of both males and females died in hospital, and this progressively fell beyond age 75. The proportions dying in nursing homes and old people's homes were considerably larger and, in the case of old people's homes, increased with age, particularly for females. Deaths in own residences were less common and varied little with age, while deaths in hospices represented about 10% of deaths at age 65–69, but declined thereafter.

#### 3.7.3 Respiratory diseases

Respiratory diseases occupy codes J00 to J99 in the ICD-10 coding system. Major causes of death within this broad category include influenza (J10–J11), pneumonia (J12–J18) and chronic lower respiratory diseases (J40–J47). In 2008 there were 67,263 deaths from respiratory diseases, representing 14% of all deaths.

Figure 15 shows the age-sex distribution of deaths with underlying cause of death of respiratory diseases, with and without contributory cause of death coding for Alzheimer's disease, dementia or senility, for registration years 2007 to 2009. Total numbers for males and females are also shown in the legend.

Figure 15: Age and sex distribution of people who died with respiratory disease as the underlying cause of death, with and without Alzheimer's disease, dementia and senility contributory cause codings, England, 2007 to 2009.



Source: Office for National Statistics, annual mortality extracts

- 195,079 people died with a respiratory disease recorded as the underlying cause of death between 2007 and 2009. 28,027 (14%) of these deaths also had Alzheimer's disease, dementia or senility coded as a contributory cause.
- A higher percentage of females (18%) than males (10%) had Alzheimer's disease, dementia or senility coded as a contributory cause of death.
- The proportion of Alzheimer's disease, dementia or senility listed as a contributory causes for people dying of respiratory diseases is similar to cardiovascular disease and reflects a similar age profile at death.

Figure 16 shows the places of occurrence of death for males and females aged 65 years and over who had a respiratory disease as the underlying cause of death, with and without Alzheimer's disease, dementia or senility contributory coding, for registration years 2007 to 2009.

Figure 16: Place of death distribution for males and females aged 65+ with respiratory disease as the underlying cause of death, with and without contributory cause codings for Alzheimer's disease, dementia or senility, England, 2007 to 2009



Source: Office for National Statistics, annual mortality extracts

- For both males and females with underlying cause of death of respiratory disease, there were considerable differences in distribution of place of death, according to whether Alzheimer's disease, dementia or senility were identified as contributory.
- Where the selected conditions were not contributory, over two-thirds of people aged 65+ died in hospital. With increasing age, larger proportions of both males and females died in old people's homes and nursing homes, and fewer died in their own residences.
- Where the selected conditions were contributory, a smaller proportion of both males and females died in hospital, and this progressively fell as age increased. The proportions dying in nursing homes and old people's homes were considerable larger and, in the case of old people's homes, increased with age. Deaths in own residences were less common and varied little with age, while deaths in hospices and elsewhere were rare.

## 4 Note for Primary Care Trust Commissioners

To support commissioning decisions, an interactive spreadsheet with PCT level data has been produced to accompany this report – see <u>http://www.endoflifecare-</u> intelligence.org.uk/resources/dataandtools.aspx. This enables commissioners to examine the number and rate of deaths registered for their PCT for Alzheimers disease, dementia and senility, per year and for the nine year period 2001–2009. Data for both 'underlying' cause and 'contributory' cause on a death certificate are given.

The numbers for individual diseases are often very small and subject to yearly fluctuation. The number of deaths per PCT is also greatly dependent on population size, which varies from 92,000 to 1,300,000 people. For this reason rates are also given.

## 5 Summary

This report is the first to provide a high level overview of mortality data from Alzheimer's disease, dementia and senility in England. It shows the absolute numbers of deaths, where these are mentioned as the underlying and contributory causes of deaths. The data on contributory cause recording highlights how important it is to search the entire mortality record for mentions of these conditions to get a clearer picture of how many people may be dying where they make a contribution to the patient's death and where they contribute to the specific needs of people at the end of their life.

The report also, through the use of population pyramids, illustrates the different age profiles of people dying from or with Alzheimer's disease, dementia and senility. These differences in age profiles are important as they will determine the needs of the individuals affected, along with their families and carers, and also determine where people are likely to receive end of life care at the time of their final illness.

People dying with Alzheimer's disease, dementia or senility recorded as either an underlying or contributory cause of death are likely to have specific end of life care needs related to these conditions. This report will be an invaluable resource to policy makers, providers and commissioners of care to the elderly and patients with Alzheimer's disease, dementia and senility, and to the non-statutory bodies who support them and their carers.

There has been an increasing tendency to record Alzheimer's disease (as the cause of dementia) on death certificates, following an increasing recognition of Alzheimer's as the disease process underlying much dementia. Along with this gradual drift toward the use of 'Alzheimer's disease' rather than terms such as senile or pre-senile dementia, which are asigned 'senility' coding, there has also been increasing recognition that vascular and other causes of dementia often overlap with Alzheimer-type pathology and may have contributed to dementias being increasingly coded with the broader term 'dementia'. In the last two years, about three times as many deaths have been attributed to 'dementia' as to Alzheimer's disease and about twice as many to 'dementia' as to 'senility'. Some caution is necessary in interpreting these mortality data codings, not only because these trends are in part a reflection of changing practice, but also becuase of under-reporting of dementia on death certification.

### **6** Future investigations

This report is the first in a series on end of life care for patients with Alzheimer's disease, dementia and senility. Subsequent analyses will further examine:

- the underlying cause of deaths where Alzheimer's disease, dementia or senility appear only as the contributory cause of death, as this is important in the understanding of the role these conditions play in co-morbidity;
- the pattern of admissions and type of care received in hospital during the last year of life for those dying in and out of hospital.

## References

Brayne C, Gao L and Matthews F, 2006. Dementia before Death in Ageing Societies – The Promise of Prevention and the Reality, PLoS Med 3(10): e397. DOI: 10.1371/journal.pmed.0030397

Martyn CN and Pippard EC 1998. Usefulness of mortality data in determining the geography and time trends of dementia, Journal of Epidemiology and Community Health, Vol 42, pp 134-137

## Appendix

|       | Early Onse | Early Onset Dementia (per 100,000) |         |  |  |  |  |  |  |  |
|-------|------------|------------------------------------|---------|--|--|--|--|--|--|--|
|       | Males      | Females                            | Persons |  |  |  |  |  |  |  |
| 30-34 | 8.9        | 9.5                                | 9.4     |  |  |  |  |  |  |  |
| 35-39 | 6.3        | 9.3                                | 7.7     |  |  |  |  |  |  |  |
| 40-44 | 8.1        | 19.6                               | 14.0    |  |  |  |  |  |  |  |
| 45-49 | 31.8       | 27.3                               | 30.4    |  |  |  |  |  |  |  |
| 50-54 | 62.7       | 55.1                               | 58.3    |  |  |  |  |  |  |  |
| 55-59 | 179.5      | 97.1                               | 136.8   |  |  |  |  |  |  |  |
| 60-64 | 198.9      | 118.0                              | 155.7   |  |  |  |  |  |  |  |
|       | Late (     | Onset Dementia                     | (%)     |  |  |  |  |  |  |  |
| 65-69 | 1.5        | 1.0                                | 1.3     |  |  |  |  |  |  |  |
| 70-74 | 3.1        | 2.4                                | 2.9     |  |  |  |  |  |  |  |
| 75-79 | 5.1        | 6.5                                | 5.9     |  |  |  |  |  |  |  |
| 80-84 | 10.2       | 13.3                               | 12.2    |  |  |  |  |  |  |  |
| 85-89 | 16.7       | 22.2                               | 20.3    |  |  |  |  |  |  |  |
| 90-94 | 27.5       | 29.6                               | 28.6    |  |  |  |  |  |  |  |
| 95+   | 30.0       | 34.4                               | 32.5    |  |  |  |  |  |  |  |

Table A1: Estimated population prevalence of dementia

Source: Dementia UK - The Full Report; Alzheimers Society, 2007

Table A2: Annual numbers of deaths with underlying and contributory causes and mentions of Alzheimer's disease, dementia and senility, England, registration years 2001 to 2009

|                        | 2001   | 2002   | 2003   | 2004   | 2005   | 2006   | 2007   | 2008   | 2009   | Total   |
|------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| Dementia               |        |        |        |        |        |        |        |        |        |         |
| Underlying             | 11,696 | 11,970 | 12,543 | 11,940 | 12,104 | 12,451 | 13,955 | 15,564 | 15,359 | 117,582 |
| Contributory           | 13,784 | 15,267 | 16,581 | 16,463 | 17,570 | 18,749 | 21,091 | 23,435 | 24,712 | 167,652 |
| Total                  | 25,480 | 27,237 | 29,124 | 28,403 | 29,674 | 31,200 | 35,046 | 38,999 | 40,071 | 285,234 |
|                        |        |        |        |        |        |        |        |        |        |         |
| Alzheimer's<br>Disease |        |        |        |        |        |        |        |        |        |         |
| Underlying             | 4,170  | 4,449  | 4,682  | 4,463  | 4,544  | 4,578  | 5,347  | 5,890  | 5,817  | 43,940  |
| Contributory           | 2,125  | 2,284  | 2,552  | 2,340  | 2,520  | 2,689  | 2,864  | 2,911  | 3,051  | 23,336  |
| Total                  | 6,295  | 6,733  | 7,234  | 6,803  | 7,064  | 7,267  | 8,211  | 8,801  | 8,868  | 67,276  |
|                        |        |        |        |        |        |        |        |        |        |         |
| Senility               |        |        |        |        |        |        |        |        |        |         |
| Underlying             | 11,343 | 11,211 | 10,899 | 9,430  | 9,308  | 8,770  | 8,855  | 8,969  | 7,262  | 86,047  |
| Contributory           | 26,459 | 27,440 | 28,670 | 27,425 | 28,707 | 29,009 | 31,055 | 32,838 | 31,365 | 262,968 |
| Total                  | 37,802 | 38,651 | 39,569 | 36,855 | 38,015 | 37,779 | 39,910 | 41,807 | 38,627 | 349,015 |
|                        |        |        |        |        |        |        |        |        |        |         |
| Total                  |        |        |        |        |        |        |        |        |        |         |
| Underlying             | 27,209 | 27,630 | 28,124 | 25,833 | 25,956 | 25,799 | 28,157 | 30,423 | 28,438 | 247,569 |
| Contributory           | 42,368 | 44,991 | 47,803 | 46,228 | 48,797 | 50,447 | 55,010 | 59,184 | 59,128 | 453,956 |
| Total                  | 69,577 | 72,621 | 75,927 | 72,061 | 74,753 | 76,264 | 83,167 | 89,607 | 87,566 | 701,525 |

|           | Dem   | entia   | Alzheimer | 's Disease | Senility |         |  |
|-----------|-------|---------|-----------|------------|----------|---------|--|
| Age group | Males | Females | Males     | Females    | Males    | Females |  |
| 00-04     | -     | -       | -         | -          | -        | -       |  |
| 05-09     | -     | -       | -         | -          | -        | -       |  |
| 10-14     | -     | -       | -         | -          | -        | -       |  |
| 15-19     | -     | -       | -         | -          | -        | -       |  |
| 20-24     | -     | -       | -         | -          | -        | -       |  |
| 25-29     | -     | -       | -         | -          | -        | -       |  |
| 30-34     | -     | -       | -         | -          | -        | -       |  |
| 35-39     | -     | -       | -         | -          | -        | -       |  |
| 40-44     | 1     | 2       | 1         | 2          | -        | -       |  |
| 45-49     | 5     | 7       | 3         | 4          | -        | -       |  |
| 50-54     | 10    | 7       | 10        | 10         | -        | -       |  |
| 55-59     | 35    | 40      | 28        | 45         | -        | -       |  |
| 60-64     | 107   | 109     | 108       | 126        | -        | -       |  |
| 65-69     | 247   | 215     | 171       | 218        | 1        | -       |  |
| 70-74     | 658   | 728     | 398       | 519        | 6        | 12      |  |
| 75-79     | 1,665 | 2,196   | 877       | 1,286      | 50       | 82      |  |
| 80-84     | 3,096 | 5,512   | 1,392     | 2,529      | 402      | 1,156   |  |
| 85-89     | 3,916 | 9,553   | 1,474     | 3,465      | 1,068    | 3,485   |  |
| 90-94     | 2,312 | 8,585   | 740       | 2,381      | 1,653    | 6,590   |  |
| 95+       | 799   | 5.073   | 175       | 1.092      | 1.545    | 9.036   |  |

Table A3: Numbers of deaths with underlying causes of Alzheimer's disease, dementia and senility by age and sex, England, registration years 2007 to 2009

| Table A4: Numbers of deaths with contributory causes of Alzheimer's disease, dementia and senility |
|--|
| by age and sex, England, registration years 2007 to 2009   |

|           | Dem   | Dementia Alzheimer's Disease Senility |       | ility   |       |         |
|-----------|-------|---------------------------------------|-------|---------|-------|---------|
| Age group | Males | Females                               | Males | Females | Males | Females |
| 00-04     | -     | -                                     | -     | -       | -     | -       |
| 05-09     | -     | -                                     | -     | -       | -     | -       |
| 10-14     | -     | -                                     | -     | -       | -     | -       |
| 15-19     | -     | -                                     | -     | -       | -     | -       |
| 20-24     | -     | -                                     | -     | -       | -     | -       |
| 25-29     | -     | -                                     | -     | -       |       | -       |
| 30-34     | -     | 1                                     | -     | -       | -     | -       |
| 35-39     | 4     | 1                                     | -     | 2       | -     | -       |
| 40-44     | 4     | 4                                     | 1     | -       | -     | -       |
| 45-49     | 12    | 13                                    | 2     | 2       | -     | -       |
| 50-54     | 35    | 34                                    | 6     | 10      | -     | -       |
| 55-59     | 103   | 83                                    | 20    | 21      | 1     | -       |
| 60-64     | 220   | 165                                   | 37    | 35      | 7     | 4       |
| 65-69     | 544   | 366                                   | 89    | 101     | 20    | 30      |
| 70-74     | 1,600 | 1,244                                 | 235   | 246     | 195   | 253     |
| 75-79     | 4,105 | 3,894                                 | 565   | 692     | 771   | 1,449   |
| 80-84     | 6,815 | 9,097                                 | 1,008 | 1,337   | 4,059 | 7,974   |
| 85-89     | 7,608 | 13,928                                | 931   | 1,730   | 7,332 | 17,843  |
| 90-94     | 3,689 | 10,003                                | 375   | 969     | 7,744 | 23,752  |
| 95+       | 1,001 | 4,665                                 | 76    | 336     | 4,390 | 19,434  |

| Age<br>group | Hospital | Old<br>People's<br>Home | Nursing<br>Home | Own<br>Residence | Hospice | Elsewhere |
|--------------|----------|-------------------------|-----------------|------------------|---------|-----------|
| 00-04        | -        | -                       | -               | -                | -       | -         |
| 05-09        | -        | -                       | -               | -                | -       | -         |
| 10-14        | -        | -                       | -               | -                | -       | -         |
| 15-19        | -        | -                       | -               | -                | -       | -         |
| 20-24        | -        | -                       | -               | -                | -       | -         |
| 25-29        | -        | -                       | -               | -                | -       | -         |
| 30-34        | -        | -                       | -               | -                | -       | -         |
| 35-39        | -        | -                       | -               | -                | -       | -         |
| 40-44        | 1        | -                       | -               | 1                | -       | -         |
| 45-49        | 2        | -                       | 1               | 4                | -       | 1         |
| 50-54        | 8        | 3                       | 5               | 3                | -       | 1         |
| 55-59        | 34       | 10                      | 10              | 7                | 1       | 1         |
| 60-64        | 116      | 21                      | 63              | 12               | 2       | -         |
| 65-69        | 200      | 54                      | 127             | 34               | 3       | 1         |
| 70-74        | 538      | 134                     | 333             | 52               | 2       | 3         |
| 75-79        | 1,310    | 403                     | 715             | 144              | 5       | 15        |
| 80-84        | 2,357    | 851                     | 1,355           | 300              | 11      | 16        |
| 85-89        | 2,844    | 1,292                   | 1,740           | 544              | 10      | 28        |
| 90-94        | 1,761    | 1,161                   | 1,229           | 521              | 4       | 29        |
| 95+          | 624      | 821                     | 723             | 328              | 1       | 22        |

Table A5: Numbers of deaths with underlying causes of Alzheimer's disease, dementia and senility by place of death, males, England, registration years 2007 to 2009

| Table A6: Numbers of deaths with underlying causes of Alzheimer's disease, dementia and senility by |
|---|
| place of death, females, England, registration years 2007 to 2009                                   |

| Age<br>group | Hospital | Old<br>People's<br>Home | Nursing<br>Home | Own Hospice |    | Elsewhere |
|--------------|----------|-------------------------|-----------------|-------------|----|-----------|
| 00-04        | -        | -                       | -               | -           | -  | -         |
| 05-09        | -        | -                       | -               | -           | -  | -         |
| 10-14        | -        | -                       | -               | -           | -  | -         |
| 15-19        | -        | -                       | -               | -           | -  | -         |
| 20-24        | -        | -                       | -               | -           | -  | -         |
| 25-29        | -        | -                       | -               | -           | -  | -         |
| 30-34        | -        | -                       | -               | -           |    |           |
| 35-39        | -        | -                       | -               | -           | -  | -         |
| 40-44        | 2        | -                       | -               | 2           | -  | -         |
| 45-49        | 6        | 3                       | 1               | 1           | -  | -         |
| 50-54        | 9        | -                       | 6               | 2           | -  | -         |
| 55-59        | 34       | 13                      | 22              | 14          | 1  | 1         |
| 60-64        | 92       | 34                      | 76              | 30          | 1  | 2         |
| 65-69        | 169      | 77                      | 140             | 45          | 2  | -         |
| 70-74        | 521      | 251                     | 396             | 83          | 4  | 4         |
| 75-79        | 1,385    | 778                     | 1,146           | 236         | 6  | 13        |
| 80-84        | 3,136    | 2,321                   | 2,968           | 712         | 7  | 53        |
| 85-89        | 5,069    | 4,757                   | 5,291           | 1,262       | 23 | 101       |
| 90-94        | 4,466    | 5,850                   | 5,547           | 1,535       | 17 | 141       |
| 95+          | 2,791    | 5,950                   | 4,867           | 1,453       | 10 | 129       |

| Table .<br>by pla | A7: Numbers of c<br>ce of death, male | leaths with contr<br>s, England, regis | ibutory causes o<br>tration years 200 | of Alzheimer's dis<br>17 to 2009 | sease, dementia a | and senility |  |
|-------------------|---------------------------------------|--|---------------------------------------|----------------------------------|-------------------|--------------|--|
| Ago               |                                       | Old                                    | Nursing                               | Own                              |                   |              |  |

| Age<br>group | Hospital | Old<br>People's<br>Home | Nursing<br>Home | Own<br>Residence | Hospice | Elsewhere |
|--------------|----------|-------------------------|-----------------|------------------|---------|-----------|
| 00-04        | -        | -                       | -               | -                | -       | -         |
| 05-09        | -        | -                       | -               | -                | -       | -         |
| 10-14        | -        | -                       | -               | -                | -       | -         |
| 15-19        | -        | -                       | -               | -                | -       | -         |
| 20-24        | -        | -                       | -               | -                | -       | -         |
| 25-29        | -        | -                       | -               | -                | -       | -         |
| 30-34        | -        | -                       | -               | -                | -       | -         |
| 35-39        | 2        | -                       | -               | 1                | -       | 1         |
| 40-44        | 3        | -                       | -               | -                | -       | -         |
| 45-49        | 8        | -                       | 3               | -                | -       | -         |
| 50-54        | 29       | 2                       | 6               | 1                | -       | 1         |
| 55-59        | 83       | 6                       | 22              | -                | 1       | -         |
| 60-64        | 154      | 28                      | 56              | -                | 5       | -         |
| 65-69        | 398      | 62                      | 129             | 3                | 10      | 3         |
| 70-74        | 1,187    | 205                     | 494             | 14               | 17      | 14        |
| 75-79        | 3,070    | 661                     | 1,229           | 40               | 43      | 40        |
| 80-84        | 6,409    | 1,613                   | 2,573           | 69               | 76      | 69        |
| 85-89        | 7,971    | 2,500                   | 3,667           | 76               | 60      | 76        |
| 90-94        | 5,332    | 2,284                   | 2,690           | 75               | 50      | 75        |
| 95+          | 2,173    | 1,315                   | 1,282           | 36               | 12      | 36        |

| Table A8: Numbers of deaths with contributory causes of Alzheimer's disease, dementia and senility |
|--|
| by place of death, females, England, registration years 2007 to 2009                               |

| Age<br>group | Hospital | Old<br>People's<br>Home | Nursing<br>Home | Own<br>Residence | Hospice | Elsewhere |
|--------------|----------|-------------------------|-----------------|------------------|---------|-----------|
| 00-04        | -        | -                       | -               | -                | -       | -         |
| 05-09        | -        | -                       | -               | -                | -       | -         |
| 10-14        | -        | -                       | -               | -                | -       | -         |
| 15-19        | -        | -                       | -               | -                | -       | -         |
| 20-24        | -        | -                       | -               | -                | -       | -         |
| 25-29        | -        | -                       | -               | -                | -       | -         |
| 30-34        | -        | -                       | 1               | -                | -       | -         |
| 35-39        | 1        | -                       | 1               | 1                | 1 -     |           |
| 40-44        | 3        | -                       | 1               | -                |         |           |
| 45-49        | 9        | -                       | 5               | -                | -       | 1         |
| 50-54        | 30       | 3                       | 3               | 7                | -       | 1         |
| 55-59        | 62       | 9                       | 17              | 13               | 2       | 1         |
| 60-64        | 117      | 18                      | 47              | 18               | 2       | 2         |
| 65-69        | 284      | 55                      | 110             | 35               | 8       | 5         |
| 70-74        | 946      | 245                     | 395             | 132              | 17      | 8         |
| 75-79        | 3,022    | 1,032                   | 1,458           | 446              | 43      | 34        |
| 80-84        | 8,179    | 3,647                   | 4,816           | 1,600            | 56      | 110       |
| 85-89        | 13,639   | 7,855                   | 8,887           | 2,840            | 78      | 202       |
| 90-94        | 12,659   | 9,440                   | 9,207           | 3,122            | 53      | 243       |
| 95+          | 7,557    | 7,943                   | 6,705           | 2,024            | 34      | 181       |

Table A9: Numbers of people aged 65+ projected to have dementia, England and Government Office Regions, 2010 to 2030

#### England

| Area    | Age group | 2010    | 2015    | 2020    | 2025    | 2030      |
|---------|-----------|---------|---------|---------|---------|-----------|
| England | 65-69     | 30,038  | 36,488  | 33,203  | 36,332  | 41,649    |
| England | 70-74     | 56,014  | 61,152  | 74,855  | 68,502  | 75,247    |
| England | 75-79     | 97,922  | 106,648 | 117,834 | 145,314 | 133,916   |
| England | 80-84     | 150,624 | 161,070 | 181,872 | 204,432 | 254,216   |
| England | 85+       | 279,063 | 319,468 | 373,535 | 453,663 | 549,593   |
| England | Total     | 613,661 | 684,825 | 781,297 | 908,242 | 1,054,621 |

Source: Projecting Older People Population Information System (POPPI), <u>http://www.poppi.org.uk/index.php?pageNo=334&areaID=8652&loc=8652</u>, accessed November 2010

#### **Government Office Regions**

| Area          | Age group | 2010   | 2015   | 2020   | 2025   | 2030   |
|---------------|-----------|--------|--------|--------|--------|--------|
| East Midlands | 65-69     | 2,826  | 3,454  | 3,147  | 3,415  | 3,952  |
| East Midlands | 70-74     | 5,015  | 5,799  | 7,129  | 6,531  | 7,124  |
| East Midlands | 75-79     | 8,582  | 9,540  | 11,135 | 13,789 | 12,718 |
| East Midlands | 80-84     | 13,177 | 14,131 | 16,289 | 19,294 | 24,084 |
| East Midlands | 85+       | 23,773 | 27,567 | 32,518 | 40,187 | 50,468 |
| East Midlands | Total     | 53,372 | 60,491 | 70,218 | 83,215 | 98,346 |

Source: Projecting Older People Population Information System (POPPI), <u>http://www.poppi.org.uk/index.php?pageNo=314&areaID=8640&loc=8640</u>, accessed November 2010

| Area            | Age group | 2010   | 2015   | 2020   | 2025    | 2030    |
|-----------------|-----------|--------|--------|--------|---------|---------|
| East of England | 65-69     | 3,562  | 4,441  | 3,993  | 4,382   | 5,093   |
| East of England | 70-74     | 6,581  | 7,408  | 9,285  | 8,402   | 9,256   |
| East of England | 75-79     | 11,611 | 12,783 | 14,535 | 18,331  | 16,723  |
| East of England | 80-84     | 17,963 | 19,577 | 22,274 | 25,677  | 32,585  |
| East of England | 85+       | 33,247 | 39,110 | 46,590 | 57,121  | 70,332  |
| East of England | Total     | 72,964 | 83,319 | 96,677 | 113,912 | 133,988 |

Source: Projecting Older People Population Information System (POPPI), <u>http://www.poppi.org.uk/index.php?pageNo=314&areaID=8646&loc=8646</u>, accessed November 2010

| Area   | Age group | 2010   | 2015   | 2020   | 2025   | 2030   |
|--------|-----------|--------|--------|--------|--------|--------|
| London | 65-69     | 2,938  | 3,444  | 3,255  | 3,741  | 4,391  |
| London | 70-74     | 5,828  | 5,652  | 6,691  | 6,348  | 7,313  |
| London | 75-79     | 10,335 | 10,711 | 10,607 | 12,662 | 12,069 |
| London | 80-84     | 15,909 | 16,406 | 17,625 | 17,810 | 21,462 |
| London | 85+       | 30,131 | 33,161 | 37,259 | 43,178 | 48,387 |
| London | Total     | 65,139 | 69,375 | 75,436 | 83,739 | 93,622 |

Source: Projecting Older People Population Information System (POPPI),

http://www.poppi.org.uk/index.php?pageNo=314&areaID=8647&loc=8647, accessed November 2010

#### National End of Life Care Intelligence Network

Deaths from Alzheimer's disease, dementia and senility

| Area       | Age group | 2010   | 2015   | 2020   | 2025   | 2030   |
|------------|-----------|--------|--------|--------|--------|--------|
| North East | 65-69     | 1,535  | 1,930  | 1,810  | 1,966  | 2,144  |
| North East | 70-74     | 3,050  | 3,093  | 3,921  | 3,702  | 4,041  |
| North East | 75-79     | 5,336  | 5,701  | 5,843  | 7,462  | 7,090  |
| North East | 80-84     | 7,812  | 8,454  | 9,431  | 9,863  | 12,718 |
| North East | 85+       | 13,147 | 15,210 | 18,076 | 22,013 | 25,661 |
| North East | Total     | 30,880 | 34,387 | 39,081 | 45,006 | 51,655 |

Source: Projecting Older People Population Information System (POPPI), <u>http://www.poppi.org.uk/index.php?pageNo=314&areaID=8648&loc=8648</u>, accessed November 2010

| Area       | Age group | 2010   | 2015   | 2020    | 2025    | 2030    |
|------------|-----------|--------|--------|---------|---------|---------|
| North West | 65-69     | 4,102  | 4,965  | 4,474   | 4,823   | 5,457   |
| North West | 70-74     | 7,793  | 8,217  | 10,040  | 9,106   | 9,870   |
| North West | 75-79     | 13,329 | 14,556 | 15,553  | 19,138  | 17,503  |
| North West | 80-84     | 19,983 | 21,291 | 24,201  | 26,358  | 32,783  |
| North West | 85+       | 34,798 | 39,334 | 45,956  | 56,230  | 67,099  |
| North West | Total     | 80.004 | 88.363 | 100.223 | 115.654 | 132,711 |

Source: Projecting Older People Population Information System (POPPI), <u>http://www.poppi.org.uk/index.php?pageNo=314&areaID=8649&loc=8649</u>, accessed November 2010

| Area       | Age group | 2010    | 2015    | 2020    | 2025    | 2030    |
|------------|-----------|---------|---------|---------|---------|---------|
| South East | 65-69     | 5,052   | 6,237   | 5,614   | 6,217   | 7,198   |
| South East | 70-74     | 9,267   | 10,440  | 12,972  | 11,744  | 13,048  |
| South East | 75-79     | 16,577  | 18,055  | 20,521  | 25,675  | 23,412  |
| South East | 80-84     | 26,029  | 28,186  | 31,694  | 36,513  | 45,952  |
| South East | 85+       | 51,388  | 59,180  | 69,613  | 84,317  | 103,244 |
| South East | Total     | 108,312 | 122,098 | 140,414 | 164,465 | 192,854 |

Source: Projecting Older People Population Information System (POPPI), <u>http://www.poppi.org.uk/index.php?pageNo=314&areaID=8650&loc=8650</u>, accessed November 2010

| Area       | Age group | 2010   | 2015   | 2020   | 2025    | 2030    |
|------------|-----------|--------|--------|--------|---------|---------|
| South West | 65-69     | 3,616  | 4,406  | 3,961  | 4,285   | 4,923   |
| South West | 70-74     | 6,516  | 7,558  | 9,267  | 8,386   | 9,108   |
| South West | 75-79     | 11,568 | 12,688 | 14,834 | 18,320  | 16,715  |
| South West | 80-84     | 18,608 | 19,669 | 22,275 | 26,363  | 32,796  |
| South West | 85+       | 36,524 | 41,762 | 48,336 | 58,453  | 72,663  |
| South West | Total     | 76,832 | 86,084 | 98,673 | 115,807 | 136,204 |

Source: Projecting Older People Population Information System (POPPI), <u>http://www.poppi.org.uk/index.php?pageNo=314&areaID=8651&loc=8651</u>, accessed November 2010

### **Further information**

This report is available online at: www.endoflifecare-intelligence.org.uk

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## About the National End of Life Care Intelligence Network

The Department of Health's National End of Life Care Strategy, published in 2008, pledged to commission a National End of Life Care Intelligence Network (NEoLCIN). The Network was launched in May 2010. It is tasked with collating existing data and information on end of life care for adults in England. This is with the aim of helping the NHS and its partners commission and deliver high quality end of life care, in a way that makes the most efficient use of resources and responds to the wishes of dying people and their families.

Key partners include the National Cancer Intelligence Network (NCIN), which will work closely with the Network to improve end of life care intelligence; and the South West Public Health Observatory, lead public health observatory for end of life care, which hosts the NEoLCIN website. The SWPHO has been commissioned to produce key outputs and analyses for the Network, including the national End of Life Care Profiles.

See www.endoflifecare-intelligence.org.uk for more information about the Network and its partners.

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