

# Association of comorbidities and socioeconomic deprivation among people who died with dementia in England 2013-2023

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# Dementia and co-morbidity

## Complex inter-relationships

- Shared clinical risk factors
- Shared socio-economic risk factors
- Pneumonia, urinary infections often cause death in end-stage dementia
- May occur independently

## Change the care needs and prognosis of dementia

- associated with faster cognitive and functional decline, and lower quality of life.
- Significant burden on the nation's health and care services.

# Aims

- To update earlier report, to understand the needs of people who are dying from dementia.
- To explore conditions recorded alongside dementia on death certificates.
- To test our hypothesis that number of comorbidities at death is associated with deprivation levels.



Public Health  
England

Protecting and improving the nation's health

**Data Analysis Report**  
**Dying with Dementia**  
National Dementia Intelligence Network  
National End of Life Care Intelligence  
Network

# Methods

- **Dataset:** Office for National Statistics (ONS): Public Health England Annual Mortality Extract
- **Population:** Certificates for deaths of:
  - aged +18
  - registered in England between 2013-2023
- Each death certificate includes one primary and up to 15 contributory causes.
- **Primary (underlying) cause of death:** the disease that initiated the train of events directly linked to death.
- **contributory cause of death:** part of the causal sequence of events leading or contributing to death.

Medical certificate of cause of death									
Name of deceased									
Date of death		Day	Month	Year	Time of death		Hour	Min	
Place of death									
Cause of death									
I hereby certify that to the best of my knowledge and belief, the cause of death was as stated below:									
1. Disease or condition directly leading to death								Approximate interval between onset and death	
Antecedent causes								Years Months Days	
Morbidity conditions, if any, giving rise to above cause, stating the underlying condition last									
a.)									
b.)									
c.)									
d.)									
2. Other significant conditions contributing to the death, but not related to the disease or condition causing it									
Please tick the relevant box									
Post mortem					Attendance on deceased				
PM1 <input type="checkbox"/> Post mortem has been done and information is included above					A1 <input type="checkbox"/> I was in attendance upon the deceased during last illness				
PM2 <input type="checkbox"/> Post mortem information may be available later					A2 <input type="checkbox"/> I was not in attendance upon the deceased during last illness: the doctor who was unable to provide the certificate				
PM3 <input type="checkbox"/> No post mortem is being done					A3 <input type="checkbox"/> No doctor was in attendance on the deceased				
Procurator fiscal/Coroner									
PF <input type="checkbox"/> This death has been reported to the procurator fiscal/coroner									
Signature					Date:				
Name in BLOCK CAPITALS					For a death in hospital				
Official address					Name of the consultant responsible				
Counterfoil - Medical certificate of cause of death									
Name of deceased					Cause of death				
Date of death					I (a)				
Place of death					(b)				
					(c)				
					(d)				
					II				
					Date of certificate				
Please circle as appropriate									
Post mortem					PM1 PM2 PM3				
Procurator fiscal/Coroner					PF A1 A2 A3				
Attendance on deceased					A1 A2 A3				

# Methods

- **Dementia:** the presence of any ICD-10 code relating to a dementia diagnosis.

Condition	ICD-10 codes
Alzheimer's disease	F00.0, F00.1, F00.2, F00.9, G30.0, G30.1, G30.8, G30.9
Vascular dementia	F01.0, F01.1, F01.2, F01.3, F01.8, F01.9
Dementia with Lewy bodies and Parkinson's disease dementia	F02.3, F02.8, G20, G31.8,
Unspecified dementia	F03, G31.9
Other types of dementia	F02.0, F02.1, F02.2, F02.4, G31.0, G31.1, G31.2

- **Comorbidity:** any condition recorded on the death certificates as a cause of death (primary or contributory) in addition to dementia; conditions with  $\geq 5\%$  occurrence in the cohort.

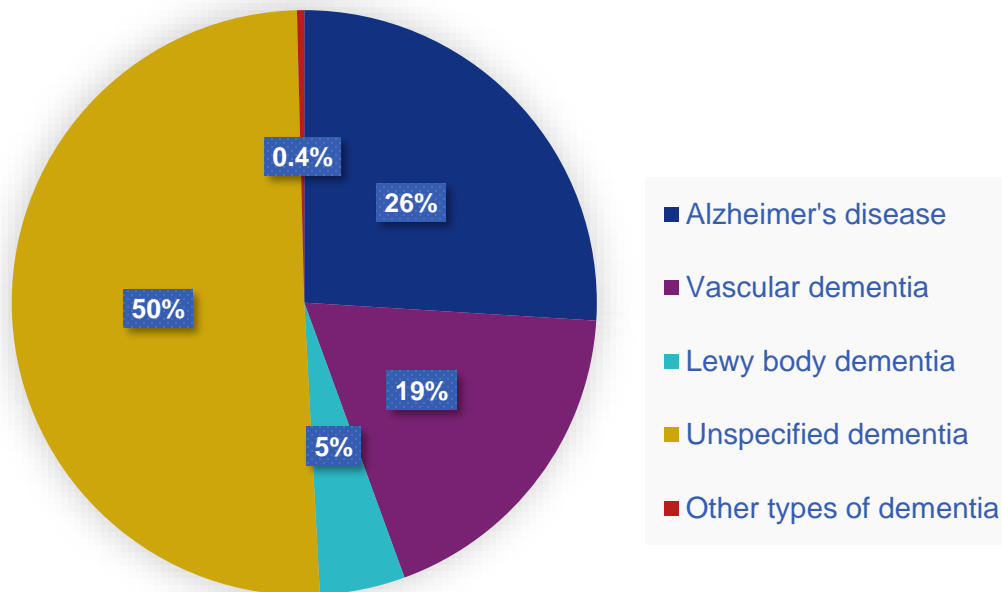
# Methods

- We reported the *number of people* in England who died with a dementia recorded (as a primary or contributory cause); *dementia subtype* diagnoses, *year of death registration*,
- and sociodemographic factors including:
  - 1) Sex
  - 2) Age at death: defined in groups of 10-year ( $\leq 65$ , 66-75, 76-85, 86-95,  $>95$ )
  - 3) Country of birth
  - 4) Socioeconomic status: defined using Index of Multiple Deprivation (IMD) quintiles

# Results

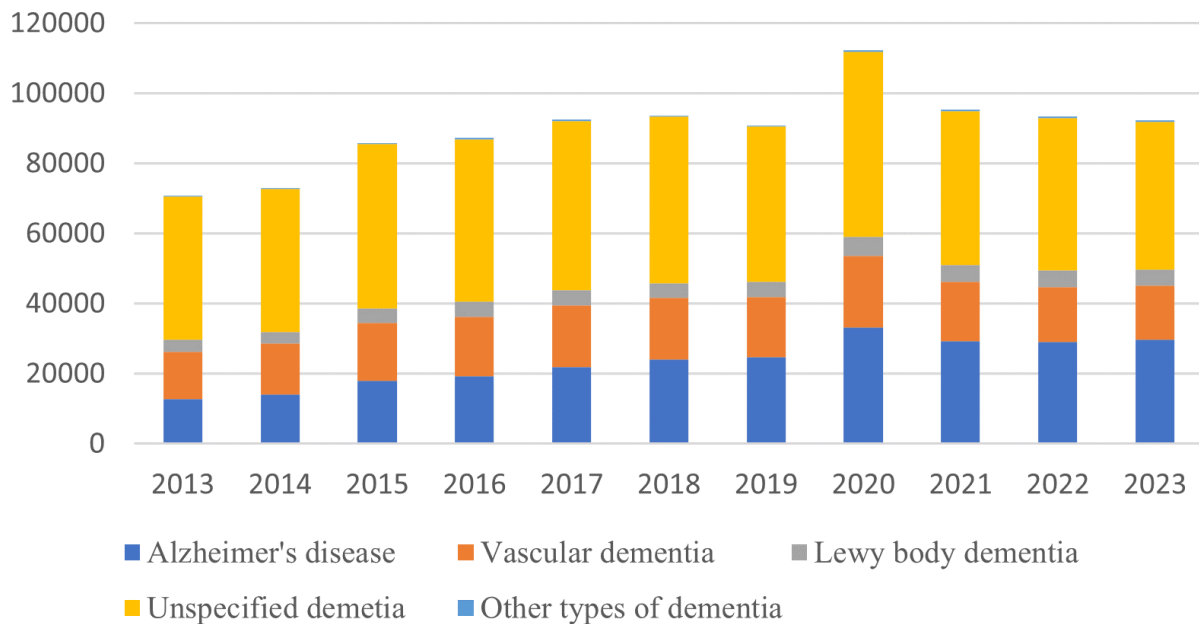
- Between 2013 and 2023 there were **987,719** deaths recorded with dementia as a cause (primary and contributory)
- 693,663** (70.2%) recorded dementia as the primary cause of death.

Dementia subtypes recorded on death certificates



# Results

Deaths with dementia as a primary or contributory cause (specifying subtype) by year (N=987,719)





# Results

- 614,419 (**62.2%**) of deaths from dementia (primary or contributory), were recorded in **women**
- **65%** (n= 643,026) were aged 85+.
- Most were born in **England** (846,584; 85.7%), Scotland (22,706; 2.3%), Ireland (22,991; 2.3%), Wales (18,166; 1.8%) or India (11,630; 1.1%).

Deaths by dementia across deprivation areas					
Type of dementia	1	2	3	4	5
Alzheimer's disease	43,255	46,382	53,423	56,795	56,325
Vascular dementia	34,175	35,313	38,161	38,609	36,269
Lewy body dementia	7,067	8,524	10,195	10,971	11,217
Unspecified dementia	95,454	99,801	105,408	101,993	94,760
Other types of dementia	572	670	764	782	834

# Results

## Comorbidities

- **15.1%** (n=149,447) of included death certificates recorded dementia as the only cause of death.
- Others recorded <10 comorbidities as primary or contributory causes of death (median=1; IQR=1-2).

IMD quintile	Number of conditions recorded on death certificate						
	0	1	2	3	4	5	≥6
<b>1 (most deprived)</b>	27,610	67,631	48,935	24,156	8,807	2,561	823
<b>2</b>	29,147	72,588	51,345	25,368	8,850	2,560	832
<b>3</b>	32,893	81,953	55,239	25,779	8,858	2,393	836
<b>4</b>	33,476	83,612	55,200	25,099	8,520	2,469	774
<b>5 (least deprived)</b>	32,926	80,963	51,694	23,127	7,818	2,215	662

- After controlling for age and sex, death certificates of people in areas with **higher deprivation** included **more comorbidities** ( $R^2=0.01$ ,  $F(6, 987719) = 1681$ ,  $p < 0.001$ ).

# Results

## Dementia: Contributory

- **Primary causes of death**

- 1) Diseases of the **circulatory** system (107,136; 36.4%)
- 2) **Cancers** (54,538; 18.5%)
- 3) Diseases of the **respiratory** system (31,431; 10.7%)
- 4) Diseases of the **digestive** system (18,637; 6.3%)

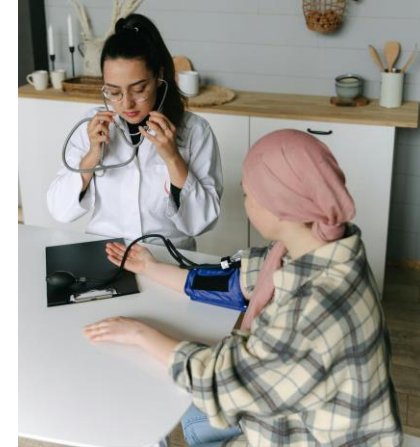
## Dementia: Primary

- **Contributory causes of death**

- 1) “Senility” (254,437; 25.7%)
- 2) Influenza and pneumonia (183,203; 18.5%)
- 3) Ischaemic heart diseases (114,871; 11.6%)
- 4) Cancers (107,444; 10.8%)
- 5) Hypertensive diseases (99,517; 10%)
- 6) Diabetes (98,517; 10%)

# Discussion

- Slight increase in deaths from dementia from 2013-23:
  - aging population (ONS, 2025),
  - excess deaths during the Covid-19 pandemic (ONS, 2023)
  - increasing rate of diagnosis of dementia (NHS England, 2024)
- People with dementia commonly die with cardiometabolic diseases. (Boivin-Proulx et al., 2023; Public Health England, 2019)
- One in ten people dying with dementia had **diabetes mellitus**.
- One in ten people who died with dementia had **cancer**.



# Dementia rarely travels alone, especially towards the end of life

Limitations: under-recording

Need to account for complexity of dementia care in policies to drive equity

Consider how to meet the needs of under-served groups who receive less dementia care but more likely to have complex needs

Article

**Exploring the provision and support of care for long-term conditions in dementia: A qualitative study combining interviews and document analysis**

**Jessica Rees** 

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Dementia  
2023, Vol. 22(4) 820-837  
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DOI: 10.1177/14713012231161854  
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# Acknowledgement

- This work is a collaboration between Department of Health and Social Care (DHSC) and the NIHR Dementia and Neurodegeneration Policy Research Unit- Queen Mary University of London (DeNPRU-QM). This study was conducted as part of a research policy secondment by SZ in the DHSC.

# Thank you



Queen Mary  
University of London