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Appendices: Deaths at home during the Covid-19 pandemic

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Appendices

1 Defining characteristics

For ethnic group we used the six Office for National Statistics (ONS) groupings (Asian, black, mixed, any other, white and unknown) because when we trialled the 16 ONS groupings the numbers were low and potentially disclosive across groups.* We drew ethnic group from the GP record but if it was unknown, we replaced it with a known ethnic group from the hospital data. Not everyone in our cohorts had an Index of Multiple Deprivation (IMD) quintile due to some missing address information or their address being outside England. For place of death we combined 'elsewhere' and 'other communal establishment' to ensure the group was large enough to not be disclosive. We used six broad groupings for cause of death from the ONS (cancer, circulatory diseases, dementia and Alzheimer's disease, flu and pneumonia, other respiratory diseases and all other causes) and additionally separated out Covid-19 deaths as these were influential for our pandemic cohort.[†]

- * Office for National Statistics (undated) 'Ethnic group, national identity and religion'. www.ons.gov.uk/methodology/classificationsandstandards/measuringequality/ethnic groupnationalidentityandreligion#ethnic-group. Accessed 2 December 2022.
- Office for National Statistics (2020) 'Quarterly mortality report, England:
 October to December 2019 and year-end review'. www.ons.gov.uk/
 peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/articles/
 quarterlymortalityreports/octobertodecember2019. Accessed 2 December 2022.

2 Proportion of ONS-published deaths among the prepandemic and pandemic cohorts

 Table A1: Proportion of ONS-published deaths among the pre-pandemic and pandemic cohorts by sex, age group, region and top-10 leading causes of death in each period

Variable	Category	Pre-pandemic	Pandemic
Sov	Female	39.1%	39.0%
JEX	Male	39.4%	39.1%
	<75	38.6%	38.0%
	75–79	39.8%	39.6%
Age group	80-84	39.6%	39.2%
	85–89	39.4%	39.6%
	90+	39.6%	39.9%
	East Midlands	79.0%	79.3%
	East of England	74.6%	75.3%
	London	13.1%	13.2%
	North East	52.3%	52.3%
Region	North West	4.8%	4.6%
	South East	19.2%	18.9%
	South West	51.0%	51.4%
	West Midlands	14.1%	14.2%
	Yorkshire and the Humber	72.1%	72.4%

Variable	Category	Pre-pandemic	Pandemic
	Cerebrovascular diseases	41.2%	40.0%
	Chronic lower respiratory diseases	40.5%	38.3%
	Covid-19	_	39.5%
	Dementia and Alzheimer's disease	39.5%	39.3%
	Influenza and pneumonia	40.1%	38.9%
	Ischaemic heart diseases	42.6%	41.4%
ONS leading cause of death	Malignant neoplasm of colon, sigmoid, rectum and anus	39.7%	40.0%
groupings	Malignant neoplasm of prostate	45.9%	_
	Malignant neoplasm of trachea, bronchus and lung	39.7%	39.8%
	Malignant neoplasms, stated or presumed to be primary of lymphoid, haematopoietic and related tissue	39.0%	46.2%
	Symptoms, signs and ill-defined conditions	43.8%	43.4%

Source: Office for National Statistics.*,\$, 9, 9,**

- Office for National Statistics (2022) 'Monthly mortality analysis, England and Wales'.
 www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/
 deaths/datasets/monthlymortalityanalysisenglandandwales.
 Accessed 2 December 2022.
- § Office for National Statistics (2020) 'Provisional leading causes of death by month of death registration and country, England and Wales: deaths registered January to June 2020'. www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/ deaths/adhocs/12656provisionalleadingcausesofdeathbymonthofdeath registrationandcountryenglandandwalesdeathsregisteredjanuarytojune2020. Accessed 2 December 2022.
- Office for National Statistics (2020) 'Deaths by leading causes groupings by month of occurrence, England, 2015 to 2019'.
 www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/ deaths/adhocs/12060deathsbyleadingcausesgroupingsbymonthofoccurrence england2015to2019. Accessed 2 December 2022.
- ** Office for National Statistics (2022) 'Deaths registered monthly in England and Wales'. www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/ deaths/datasets/monthlyfiguresondeathsregisteredbyareaofusualresidence. Accessed 2 December 2022.



Figure A1: Proportion of ONS-published deaths in our study population by place

Note: At the time of the analysis, published ONS deaths by place of death were only available for January 2020 to February 2021.

Source: Office for National Statistics (2022) 'Monthly mortality analysis, England and Wales' and Office for National Statistics (2020) 'Provisional leading causes of death by month of death registration and country, England and Wales: deaths registered January to June 2020'. See footnotes on previous page for detail.

3 **Statistical methods**

To reduce the risk of disclosure, all counts were rounded to the nearest 10 and averages were rounded to three decimal places prior to removal from the secure OpenSSAFELY-TPP environment. We compared the differences in the proportion of each characteristic by cohort with Pearson's chi-squared. We compared the average number of events per person between cohorts and characteristic categories using Poisson regression models and the proportion of people with at least one or three events with binomial regression models.

4 Detail on measures generated from GP data

General practice interactions





Community nursing team care

We created a measure of community nursing team care by combining codelists to identify district nursing, multidisciplinary teams and cancer multidisciplinary teams.^{++,#+,§§} Coding of community nursing team care varies across England and district nursing can be included under a broader bracket of multidisciplinary team care, so to try to ensure we captured community nursing in all areas, our measure combined all types of activity. Overall coding of both community nursing and multidisciplinary teams was rare, with less than 2% of the practice population having community nursing coded per month in practices with the most community nursing coded (see Figure A4).

- ++ OpenCodelists (undated) 'Community nursing'. www.opencodelists.org/codelist/user/ eiliskeeble/community-nursing/5e41bd18. Accessed 2 December 2022.
- ## OpenCodelists (undated) 'Cancer multidisciplinary team'. www.opencodelists.org/ codelist/user/eiliskeeble/cancer-multidisciplinary-team/15c6236f. Accessed 2 December 2022.
- §§ OpenCodelists (undated) 'Multidisciplinary team'. www.opencodelists.org/codelist/ user/eiliskeeble/multidisciplinary-team/7cb6b039. Accessed 2 December 2022.

Up to 5% of patients per month in practices with the most multidisciplinary team coding had multidisciplinary team activity coded before the pandemic and this increased during the pandemic to around 7% (see Figure A5). Up to 1% of patients had cancer multidisciplinary team activity coded per month (see Figure A6).







Figure A6: Proportion of the practice population with at least one cancer multidisciplinary team activity coded per month, split by practice deciles



Medications prescribed for symptom management

We developed codelists to identify medications that general practice prescribed for symptom management for people approaching the end of life. This was based on a set of priority medicines for end-of-life care during the pandemic.^{¶¶} We chose this set of medicines as the basis because it increased the chances that they would have been consistently used across practices. All the medications in our codelists are delivered subcutaneously and links for their codelists are given in Table A2. Across practices there was a peak in prescribing in April 2020, with around 5% of patients in the top prescribing practices having end-of-life medications prescribed (see Figure A7).

Missing morphine prescriptions

After completing the analysis it was found that a number of morphine sulfate 10mg prescriptions, completed by hand, were not captured by the codelist. As OpenSAFELY-TPP is a live database, we made a pragmatic decision to focus our investigations on the medications and not update every part of the analysis. We have reported that 12,370 people who died at home in the pre-pandemic period had medications prescribed for symptom management in the last month of life and 17,780 did so in the pandemic. Including the additional prescriptions would have increased these values by approximately 2%. The impact of the missing morphine sulphate prescriptions is therefore minimal as the majority of people were prescribed other medications for symptom management and were already captured in the analysis that way.

¶ Association for Palliative Medicine (undated) 'Priority medicines for palliative and end
of life care during a pandemic'. https://apmonline.org/wp-content/uploads/2020/04/
priority-meds-for-end-of-life-care-290420-final-2.pdf

Table A2: End-of-life medications and codelists

Medication	Codelist URL
Glycopyrronium	www.opencodelists.org/codelist/opensafely/glycopyrronium- subcutaneous-formulations/0c207c6f
Haloperidol	www.opencodelists.org/codelist/opensafely/haloperidol-subcutaneous- dmd/78768925
Hyoscine butylbromide	www.opencodelists.org/codelist/opensafely/hyoscine-butylbromide- subcutaneous-formulations/252fefa4
Levomepromazine	www.opencodelists.org/codelist/opensafely/levomepromazine- subcutaneous/40f222cf
Midazolam	www.opencodelists.org/codelist/opensafely/midazolam-end-of- life/4c1b3c89
Morphine	www.opencodelists.org/codelist/opensafely/morphine-subcutaneous- dmd/1185fc5b
Oxycodone	www.opencodelists.org/codelist/opensafely/oxycodone-subcutaneous- dmd/2a956f90



Palliative care

We used the Quality and Outcomes Framework (QOF) palliative care reference set as the codelist for our palliative care measure.^{***} We chose this measure of palliative care because it was more likely to be consistent across practices and over time. In general, coding of palliative care across practices was rare, with less than 0.1% of patients having it coded per month at the majority of practices (see Figure A8). The Quality and Outcomes Framework was suspended during the pandemic and this may have impacted the likelihood of these palliative care codes being used.



*** OpenCodelists (undated) 'Palliative care codes'. www.opencodelists.org/codelist/nhsdprimary-care-domain-refsets/palcare_cod/20200812. Accessed 2 December 2022.

Unreported measures

In addition to the measures that we have published, we also explored whether it was possible to identify hospice care and ambulance incidents in GP data. Our codelist for hospice care included codes reflecting, among others, hospice referrals, hospice admissions and whether hospice-at-home services were provided. We found very few people with hospice activity coded. Across the practices with the highest amount of coding, less than 0.2% of the population in the practices had hospice activity coded (see Figure A9).⁺⁺⁺ This may be partly due to referral data in the OpenSAFELY-TPP databases being incomplete. We therefore chose to exclude this measure.

Our codelist for ambulance incidents covered any mentions of ambulance care, including but not limited to transportation by ambulance, ambulance requests for a patient and arrival by ambulance. Coding for these incidents was more frequent than that for hospice activity, with up to 3% of patients in the practices with the most ambulance coding having activity coded (see Figure A10). However, after discussion with our advisory group, we concluded that this codelist was unlikely to be capturing most ambulance activity as generally GPs are unaware that ambulance requests have been made for patients and, therefore, without a shared record, the information will not be consistently recorded.

+++ OpenSAFELY.org (undated) 'The OpenSAFELY-TPP database'. https://docs. opensafely.org/data-sources/systmone/#the-opensafely-tpp-database. Accessed 2 December 2022.





Figure A10: Proportion of the practice population with at least one ambulance activity coded per month, split by practice deciles



5 Characteristics of people who died by place of death

Pre-pandemic

Characteristic	All (%)	Care home (%)	Elsewhere/ other communal establish- ment (%)	Home (%)	Hospice (%)	Hospital (%)
Number	146,510	33,740	3,670	36,140	8,130	64,830
Female	73,050 (49.9)	20,930 (62.0)	1,240 (33.8)	15,830 (43.8)	3,980 (49.0)	31,070 (47.9)
Aged 70+	115,980 (79.2)	32,350 (95.9)	1,620 (44.1)	25,630 (70.9)	5,020 (61.7)	51,370 (79.2)
Ethnic group:						
Asian	3,340 (2.3)	210 (0.6)	110 (3.0)	940 (2.6)	120 (1.5)	1,960 (3.0)
Black	1,260 (0.9)	150 (0.4)	60 (1.6)	340 (0.9)	80 (1.0)	640 (1.0)
Mixed	520 (0.4)	80 (0.2)	20 (0.5)	150 (0.4)	40 (0.5)	230 (0.4)
Other	870 (0.6)	140 (0.4)	30 (0.8)	190 (0.5)	50 (0.6)	450 (0.7)
White	136,300 (93.0)	32,080 (95.1)	3,160 (86.3)	32,730 (90.5)	7,750 (95.2)	60,590 (93.5)
Unknown	4,220 (2.9)	1,090 (3.2)	280 (7.7)	1,800 (5.0)	100 (1.2)	950 (1.5)
Index of Multip	le Deprivation (IMD) quintile:				
1 (most deprived)	29,150 (19.9)	5,950 (17.6)	830 (22.6)	7,460 (20.6)	1,330 (16.4)	13,590 (21.0)
2	29,540 (20.2)	7,030 (20.8)	740 (20.1)	7,140 (19.8)	1,480 (18.2)	13,150 (20.3)
3	31,470 (21.5)	7,490 (22.2)	750 (20.4)	7,640 (21.1)	1,750 (21.5)	13,840 (21.4)
4	28,920 (19.7)	6,700 (19.9)	710 (19.3)	7,270 (20.1)	1,720 (21.2)	12,520 (19.3)
5 (least deprived)	25,030 (17.1)	6,100 (18.1)	570 (15.5)	5,980 (16.5)	1,700 (20.9)	10,680 (16.5)
Unknown	470 (1.4)	80 (2.2)	660 (1.8)	150 (1.8)	1,040 (1.6)	2,400 (1.6)
Cause of death	:					
Cancer	40,360 (27.5)	6,110 (18.1)	650 (17.8)	12,740 (35.2)	6,820 (83.7)	14,050 (21.7)
Circulatory diseases	36,150 (24.7)	5,860 (17.4)	1,090 (29.8)	10,950 (30.3)	420 (5.2)	17,830 (27.5)
Covid-19	_	-	-	-	-	-
Dementia and Alzheimer's disease	18,580 (12.7)	12,370 (36.7)	170 (4.6)	1,950 (5.4)	80 (1.0)	4,010 (6.2)
Flu and pneumonia	6,830 (4.7)	880 (2.6)	30 (0.8)	780 (2.2)	40 (0.5)	5,100 (7.9)
Other respiratory diseases	12,460 (8.5)	1,980 (5.9)	120 (3.3)	2,850 (7.9)	210 (2.6)	7,310 (11.3)
All other causes	32 120 (21 9)	6,540 (19,4)	1,600 (43.7)	6,880 (19.0)	580 (7.1)	16.520 (25.5)

Table A3: Characteristics of people who died in the pre-pandemic period by place of death

During the pandemic

Table A4: Characteristics of people who died in the pandemic period by place of death

Characteristic	All (%)	Care home (%)	Elsewhere/ other communal establish- ment (%)	Home (%)	Hospice (%)	Hospital (%)
Number	164,350	34,330	3,910	46,930	6,840	72,340
Female	80,610 (49.1)	21,730 (63.3)	1,520 (38.9)	21,160 (45.1)	3,350 (49.0)	32,860 (45.4)
Aged 70+	129,850 (79.0)	33,180 (96.6)	1,950 (49.9)	33,790 (72.0)	4,430 (64.8)	56940 (78.1)
Ethnic group:						
Asian	5,050 (3.1)	180 (0.5)	150 (3.8)	1,600 (3.4)	80 (1.2)	3,040 (4.2)
Black	1,820 (1.1)	150 (0.4)	80 (2.1)	630 (1.3)	60 (0.9)	900 (1.2)
Mixed	670 (0.4)	70 (0.2)	20 (0.5)	220 (0.5)	30 (0.4)	340 (0.5)
Other	1,060 (0.6)	120 (0.3)	30 (0.8)	300 (0.6)	60 (0.9)	560 (0.8)
White	151,920 (92.4)	33,030 (96.2)	3,410 (87.4)	42,470 (90.5)	6,510 (95.2)	66,500 (91.9)
Unknown	3,820 (2.3)	790 (2.3)	210 (5.4)	1,710 (3.6)	100 (1.5)	1,000 (1.4)
Index of Multip	le Deprivation (IMD) quintile:				
1 (most deprived)	33,000 (20.1)	5,820 (16.9)	890 (22.8)	9,570 (20.4)	1,080 (15.8)	15,640 (21.6)
2	33,320 (20.3)	7,090 (20.6)	750 (19.2)	9,110 (19.4)	1,280 (18.7)	15,090 (20.9)
3	35,280 (21.5)	7,820 (22.8)	830 (21.2)	10,000 (21.3)	1,460 (21.3)	15,180 (21.0)
4	31,720 (19.3)	6,780 (19.7)	790 (20.2)	9,170 (19.5)	1,460 (21.3)	13,530 (18.7)
5 (least deprived)	28,060 (17.1)	6,280 (18.3)	580 (14.8)	8,200 (17.5)	1,410 (20.6)	11,590 (16.0)
Unknown	560 (1.6)	70 (1.8)	880 (1.9)	150 (2.2)	1,320 (1.8)	2,960 (1.8)
Cause of death	:					
Cancer	39,550 (24.1)	4,520 (13.2)	920 (23.5)	17,520 (37.3)	5,410 (79.2)	11,180 (15.5)
Circulatory diseases	36,000 (21.9)	5,440 (15.8)	1,090 (27.9)	13,180 (28.1)	340 (5.0)	15,940 (22.0)
Covid-19	27,430 (16.7)	5,690 (16.6)	140 (3.6)	1,410 (3.0)	260 (3.8)	19,920 (27.5)
Dementia and Alzheimer's disease	16,450 (10.0)	10,640 (31.0)	200 (5.1)	2,770 (5.9)	100 (1.5)	2,750 (3.8)
Flu and pneumonia	3,900 (2.4)	480 (1.4)	30 (0.8)	580 (1.2)	20 (0.3)	2,790 (3.9)
Other respiratory diseases	9,210 (5.6)	1,260 (3.7)	160 (4.1)	2,900 (6.2)	180 (2.6)	4,710 (6.5)
All other causes	31,800 (19.4)	6,310 (18.4)	1,370 (35.0)	8,560 (18.2)	520 (7.6)	15,040 (20.8)

6 Service use by place of death

Last month of life

Table A5: Average service-use events per person in the last month of life for the pre-pandemic and pandemic periods by place of death (n = total number of events)

	Care home		Elsewhere/other		Home		Hospice		Hospital	
Service type	Pre- pandemic (n)	Pandemic (n)								
A&E visits	0.22 (7,254)	0.20* (7,003)	0.21 (778)	0.22 (852)	0.19 (6,758)	0.20* (9,527)	0.33 (2,683)	0.38* (2,606)	0.86 (55,494)	0.86 (55,494)
Community nursing team care	0.15 (5,128)	0.17* (5,973)	0.09 (330)	0.13* (520)	0.24 (8,710)	0.25 (11,545)	0.23 (1,878)	0.21* (1,450)	0.11 (6,872)	0.10 (7,379)
Elective admissions	0.01 (337)	0.01 (309)	0.04 (158)	0.05 (203)	0.08 (2,963)	0.08* (3,754)	0.19 (1,512)	0.15* (1,053)	0.13 (8,233)	0.10* (7,017)
Elective bed days	0.03 (978)	0.04 (1,511)	0.07 (257)	0.09 (340)	0.14 (5,060)	0.14* (6,570)	0.79 (6,423)	0.52* (3,543)	0.39 (25,413)	0.31* (22,208)
Emergency admissions	0.22 (7,322)	0.19* (6,454)	0.16 (606)	0.19* (731)	0.21 (7,589)	0.22* (10,559)	0.50 (4,073)	0.54* (3,707)	0.95 (61,718)	0.99* (71,544)
Emergency bed days	1.86 (62,621)	1.68* (57,537)	1.20 (4,397)	1.41* (5,501)	1.56 (56,270)	1.71* (80,063)	4.54 (36,918)	4.83* (33,065)	8.37 (542,562)	8.99* (650,409)
Medications prescribed	1.42 (47,824)	1.36* (46,592)	0.60 (2,202)	0.86* (3,379)	1.32 (47,754)	1.54* (72,178)	0.81 (6,577)	0.89 (6,094)	0.06 (3,893)	0.06* (4,053)
General practice interactions	2.51 (84,586)	3.78* (129,630)	1.66 (6,078)	2.86* (11,167)	2.54 (91,651)	3.83* (179,930)	2.14 (17,431)	3.23* (22,114)	1.63 (105,543)	2.21* (160,161)
Outpatient appointments	0.44 (14,913)	0.40* (13,869)	0.62 (2,264)	0.73 (2,866)	1.06 (38,453)	1.15 (54,110)	1.77 (14,423)	1.87 (12,784)	1.16 (75,073)	1.03* (74,510)
Outpatient appointments attended	0.29 (9,785)	0.29 (9,956)	0.41 (1,519)	0.54* (2,119)	0.75 (27,105)	0.90* (42,143)	1.17 (9,536)	1.37* (9,398)	0.78 (50,697)	0.73* (52,881)
Palliative care	0.83 (28,105)	0.69* (23,619)	0.34 (1,229)	0.44* (1,709)	0.73 (26,527)	0.74 (34,963)	0.64 (5,179)	0.60 (4,125)	0.10 (6,677)	0.07* (5,353)

Last three months of life

Table A6: Average service-use events per person in the last three months of life for the pre-pandemic and pandemic periods by place of death (n = total number of events)

	Care	home	Elsewhe	re/other	Hc	ome	Hos	pice	Hos	pital
Service type	Pre- pandemic (n)	Pandemic (n)								
A&E visits	0.62 (20,818)	0.57* (19,465)	0.49 (1,795)	0.53 (2,072)	0.52 (18,721)	0.52* (24,638)	0.88 (7,122)	0.91 (6,211)	1.28 (83,047)	1.30* (93,753)
Community nursing team care	0.33 (11,168)	0.38* (12,874)	0.18 (672)	0.24* (958)	0.46 (16,444)	0.47* (22,104)	0.56 (4,553)	0.52* (3,536)	0.26 (16,985)	0.26 (18,736)
Elective admissions	0.07 (2,261)	0.05* (1,614)	0.18 (672)	0.22 (864)	0.37 (13,336)	0.34* (16,050)	0.88 (7,195)	0.74* (5,048)	0.43 (27,618)	0.31* (22,353)
Elective bed days	0.22 (7,423)	0.22* (7,587)	0.38 (1,384)	0.48 (1,881)	0.67 (24,069)	0.59* (27,501)	2.35 (19,081)	1.60* (10,971)	1.13 (72,999)	0.81* (58,523)
Emergency admissions	0.64 (21,425)	0.55* (18,744)	0.43 (1,585)	0.48* (1,892)	0.60 (21,612)	0.59 (27,876)	1.25 (10,171)	1.23* (8,386)	1.42 (91,994)	1.37* (99,178)
Emergency bed days	8.22 (277,444)	6.73* (230,938)	4.14 (15,197)	4.62* (18,049)	5.66 (204,516)	5.26 (246,711)	12.75 (103,674)	11.55* (78,981)	15.52 (1,006,226)	14.49* (1,048,134)
Medications prescribed	1.70 (57,206)	1.61* (55,217)	0.73 (2,686)	1.05* (4,136)	1.60 (57,912)	1.89* (88,707)	1.31 (10,617)	1.47 (10,021)	0.10 (6,294)	0.09* (6,225)
General practice interactions	5.26 (177,337)	7.59* (260,702)	4.00 (14,669)	6.19* (24,187)	5.68 (205,094)	8.04* (377,505)	6.53 (53,089)	9.00* (61,539)	4.54 (294,652)	5.73* (414,291)
Outpatient appointments ⁺	1.32 (44,436)	1.14* (39,136)	1.69 (6,213)	1.95 (7,628)	2.92 (105,565)	3.12* (146,375)	5.61 (45,609)	5.68* (38,865)	2.96 (191,832)	2.59* (187,144)
Outpatient appointments attended [†]	0.92 (30,973)	0.84* (29,009)	1.21 (4,444)	1.49* (5,806)	2.17 (78,460)	2.49* (116,903)	4.16 (33,805)	4.52 (30,924)	2.15 (139,579)	1.95* (141,135)
Palliative care	1.14 (38,464)	0.93* (31,790)	0.46 (1,685)	0.63* (2,452)	1.05 (37,947)	1.08* (50,778)	1.24 (10,089)	1.15* (7,873)	0.20 (12,836)	0.14* (10,055)

*Significantly different from the pre-pandemic period at the 5% level.

+ Outpatient data were only available from April 2019 and therefore data for the pre-pandemic period were incomplete. The last three months of life for people who died in June 2019 span into March 2019 when no outpatient data were available. This does not affect the figures for the last month of life.

7 Cross-tabulations of the characteristics of people who died at home during the pandemic

Table A7: Counts of deaths at home during the pandemic by sex and other characteristics and the percentage of all home deaths

Characteristic	Female (%)	Male (%)
Age group:		
0–29	150 (0.3)	240 (0.5)
30–39	250 (0.5)	440 (0.9)
40-49	610 (1.3)	1,040 (2.2)
50–59	1,330 (2.8)	2,380 (5.1)
60–69	2,600 (5.5)	4,100 (8.7)
70–79	5,000 (10.6)	7,170 (15.3)
80–89	6,730 (14.3)	7,520 (16.0)
90+	4,500 (9.6)	2,900 (6.2)
Ethnicity:		
Asian	720 (1.5)	890 (1.9)
Black	280 (0.6)	340 (0.7)
Mixed	100 (0.2)	120 (0.3)
Other	130 (0.3)	170 (0.4)
White	19,210 (40.9)	23,270 (49.6)
Unknown	720 (1.5)	1,000 (2.1)
Index of Multiple Deprivation (IMD) qui	ntile:	
1 (Most deprived)	4,240 (9.0)	5,340 (11.4)
2	4,080 (8.7)	5,030 (10.7)
3	4,640 (9.9)	5,370 (11.4)
4	4,130 (8.8)	5,050 (10.8)
5 (Least deprived)	3,680 (7.8)	4,520 (9.6)
Unknown	400 (0.9)	480 (1.0)
Cause of death:		
Cancer	7,980 (17.0)	9,540 (20.3)
Circulatory diseases	5,270 (11.2)	7,920 (16.9)
Covid-19	600 (1.3)	810 (1.7)
Dementia and Alzheimer's disease	1,820 (3.9)	960 (2.0)
Flu and pneumonia	280 (0.6)	300 (0.6)
Other respiratory diseases	1,250 (2.7)	1,660 (3.5)
All other causes	3,960 (8.4)	4,610 (9.8)

Characteristic	0–29 (%)	30–39 (%)	40–49 (%)	50–59 (%)	60–69 (%)	70–79 (%)	80-89 (%)	90+ (%)
Ethnicity:								
Asian	40 (0.1)	30 (0.1)	90 (0.2)	140 (0.3)	250 (0.5)	320 (0.7)	520 (1.1)	210 (0.4)
Black	10 (0.0)	20 (0.0)	30 (0.1)	100 (0.2)	90 (0.2)	90 (0.2)	200 (0.4)	80 (0.2)
Mixed	10 (0.0)	10 (0.0)	20 (0.0)	40 (0.1)	40 (0.1)	30 (0.1)	50 (0.1)	30 (0.1)
Other	10 (0.0)	10 (0.0)	20 (0.0)	40 (0.1)	50 (0.1)	60 (0.1)	80 (0.2)	30 (0.1)
White	300 (0.6)	590 (1.3)	1,420 (3.0)	3,180 (6.8)	5,970 (12.7)	11,250 (24.0)	13,000 (27.7)	6,770 (14.4)
Unknown	20 (0.0)	40 (0.1)	70 (0.1)	210 (0.4)	300 (0.6)	410 (0.9)	400 (0.9)	270 (0.6)
Index of Multiple Deprivation (IMD) quintile:								
1 (Most deprived)	130 (0.3)	240 (0.5)	570 (1.2)	1,160 (2.5)	1,800 (3.8)	2,350 (5.0)	2,360 (5.0)	960 (2.0)
2	80 (0.2)	140 (0.3)	400 (0.9)	800 (1.7)	1,400 (3.0)	2,420 (5.2)	2,570 (5.5)	1,290 (2.7)
3	70 (0.1)	110 (0.2)	270 (0.6)	700 (1.5)	1,340 (2.9)	2,620 (5.6)	3,170 (6.8)	1,740 (3.7)
4	50 (0.1)	90 (0.2)	210 (0.4)	560 (1.2)	1,100 (2.3)	2,450 (5.2)	3,030 (6.5)	1,690 (3.6)
5 (Least deprived)	50 (0.1)	80 (0.2)	160 (0.3)	430 (0.9)	910 (1.9)	2,100 (4.5)	2,870 (6.1)	1,620 (3.4)
Unknown	10 (0.0)	20 (0.0)	30 (0.1)	70 (0.1)	160 (0.3)	230 (0.5)	260 (0.6)	90 (0.2)
Cause of death:								
Cancer	80 (0.2)	110 (0.2)	370 (0.8)	1,330 (2.8)	3,150 (6.7)	5,880 (12.5)	5,190 (11.0)	1,430 (3.0)
Circulatory diseases	20 (0.0)	80 (0.2)	370 (0.8)	1,060 (2.3)	1,850 (3.9)	3,300 (7.0)	4,230 (9.0)	2,280 (4.9)
Covid-19	10 (0.0)	30 (0.1)	60 (0.1)	160 (0.3)	260 (0.6)	300 (0.6)	380 (0.8)	220 (0.5)
Dementia and Alzheimer's disease	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	30 (0.1)	350 (0.7)	1,330 (2.8)	1,060 (2.3)
Flu and pneumonia	0 (0.0)	10 (0.0)	20 (0.0)	50 (0.1)	60 (0.1)	110 (0.2)	160 (0.3)	170 (0.4)
Other respiratory diseases	0 (0.0)	10 (0.0)	40 (0.1)	130 (0.3)	410 (0.9)	920 (2.0)	1,010 (2.1)	390 (0.8)
All other causes	270 (0.6)	460 (1.0)	800 (1.7)	980 (2.1)	940 (2.0)	1,320 (2.8)	1,960 (4.2)	1,850 (3.9)

Table A8: Counts of deaths at home during the pandemic by age group and other characteristics and the percentage of all home deaths

Table A9: Counts of deaths at home during the pandemic by ethnici	ty and other characteristics and the percentage of all home deaths
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Characteristic	Asian (%)	Black (%)	Mixed (%)	Other (%)	White (%)	Unknown (%)
Index of Multiple Deprivation (IMD) quintile:						
1 (Most deprived)	580 (1.2)	280 (0.6)	70 (0.1)	90 (0.2)	8,260 (17.6)	300 (0.6)
2	450 (1.0)	140 (0.3)	50 (0.1)	70 (0.1)	8,040 (17.1)	360 (0.8)
3	270 (0.6)	100 (0.2)	40 (0.1)	50 (0.1)	9,170 (19.5)	380 (0.8)
4	160 (0.3)	60 (0.1)	30 (0.1)	40 (0.1)	8,590 (18.3)	300 (0.6)
5 (Least deprived)	110 (0.2)	30 (0.1)	20 (0.0)	50 (0.1)	7,650 (16.3)	340 (0.7)
Unknown	40 (0.1)	20 (0.0)	10 (0.0)	10 (0.0)	770 (1.6)	40 (0.1)
Cause of death:						
Cancer	390 (0.8)	190 (0.4)	70 (0.1)	100 (0.2)	16,450 (35.0)	320 (0.7)
Circulatory diseases	450 (1.0)	180 (0.4)	60 (0.1)	80 (0.2)	11,670 (24.9)	750 (1.6)
Covid-19	200 (0.4)	60 (0.1)	10 (0.0)	20 (0.0)	1,060 (2.3)	60 (0.1)
Dementia and Alzheimer's disease	140 (0.3)	40 (0.1)	10 (0.0)	20 (0.0)	2,470 (5.3)	90 (0.2)
Flu and pneumonia	20 (0.0)	10 (0.0)	0 (0.0)	0 (0.0)	500 (1.1)	40 (0.1)
Other respiratory diseases	100 (0.2)	30 (0.1)	10 (0.0)	20 (0.0)	2,690 (5.7)	70 (0.1)
All other causes	310 (0.7)	120 (0.3)	50 (0.1)	60 (0.1)	7,640 (16.3)	390 (0.8)

Table A10: Counts of deaths at home during the pandemic by Index of Multiple Deprivation (IMD) quintile and cause of death and the percentage of all home deaths

Characteristic	Quintile 1 (%) (most deprived)	Quintile 2 (%)	Quintile 3 (%)	Quintile 4 (%)	Quintile 5 (%) (least deprived)	Unknown (%)
Cancer	3,230 (6.9)	3,280 (7.0)	3,780 (8.0)	3,630 (7.7)	3,290 (7.0)	320 (0.7)
Circulatory diseases	2,730 (5.8)	2,610 (5.6)	2,840 (6.0)	2,520 (5.4)	2,210 (4.7)	270 (0.6)
Covid-19	380 (0.8)	330 (0.7)	250 (0.5)	230 (0.5)	200 (0.4)	20 (0.0)
Dementia and Alzheimer's disease	410 (0.9)	490 (1.0)	620 (1.3)	620 (1.3)	590 (1.3)	40 (0.1)
Flu and pneumonia	130 (0.3)	110 (0.2)	130 (0.3)	110 (0.2)	80 (0.2)	10 (0.0)
Other respiratory diseases	720 (1.5)	630 (1.3)	620 (1.3)	480 (1.0)	410 (0.9)	60 (0.1)
All other causes	1,980 (4.2)	1,660 (3.5)	1,780 (3.8)	1,590 (3.4)	1,420 (3.0)	150 (0.3)

8 Demographic factors associated with service use*

Sex

Differences pre-pandemic

Women who died at home pre-pandemic received more general practice and community nursing input than men in the last month of life. Meanwhile men received more elective care and were more likely to have outpatient hospital activity.

Differences during the pandemic

In the pandemic period, there was an increase in activity for both men and women across most service types. There was a decrease in elective hospital care over the last three months of life for both men and women but men still had more elective activity during the pandemic than women. The gap in general practice interactions and medications prescribed for symptom management between women and men increased during the pandemic.

Age group

Differences pre-pandemic

In the pre-pandemic period, service use in the last month of life increased with age at death. For elective and outpatient care, activity peaked for people aged 50 to 79 whereas for emergency inpatient care it peaked for people aged 60 to 89. General practice interactions, palliative care and community nursing team care activity peaked at ages 80 to 89 while for medications prescribed for symptom management the increase was sustained up to those aged 90 and over.

Differences during the pandemic

In general, between the pre-pandemic and pandemic periods there were increases in service use for older age groups and there was little change for those aged under 40, in part due to the small number of individuals in these groups reducing our ability to test the differences. Some exceptions to this included A&E visits and outpatient appointments.

* Results tables for this section are available in Appendix 11, Tables A23 (sex) and A24 (age group)

9 Service-use changes by cause of death

Cancer

Table A11: Service use in the last month of life by cohort for deaths at home from cancer – the proportion with at least one event and average events per person

Comitor turo	Proportion with at least one event (n)		Average events per person	
Service type	Pre-pandemic (N = 12,740)	Pandemic (N = 17,520)	Pre-pandemic (N = 12,740)	Pandemic (N = 17,520)
A&E visits	21.0% (2,680)	21.5% (3,760)	0.24	0.25
Community nursing team care	23.9% (3,040)	22.7%* (3,980)	0.38	0.36*
Elective admissions	10.0% (1,280)	9.9% (1,730)	0.15	0.16
Elective bed days	10.0% (1,280)	9.9% (1,730)	0.27	0.28
Emergency admissions	28.1% (3,580)	28.5% (4,990)	0.32	0.33
Emergency bed days	28.1% (3,580)	28.5% (4,990)	2.37	2.34
Medications prescribed	59.8% (7,620)	61.2%* (10,730)	2.4	2.63*
General practice interactions	77.6% (9,880)	89.5%* (15,680)	3.58	5.36*
Outpatient appointments	54.8% (6,980)	56.4%* (9,890)	1.79	1.96*
Outpatient appointments attended	40.2% (5,120)	48.9%* (8,560)	1.27	1.56*
Palliative care	49.2% (6,270)	46.3%* (8,110)	1.28	1.22*

Circulatory diseases

Table A12: Service use in the last month of life by cohort for deaths at home from circulatory diseases – the proportion with at least one event and average events per person

Comico turo	Proportion with at least one event (n)		Average events per person	
Service type	Pre-pandemic (N = 10,950)	Pandemic (N = 13,180)	Pre-pandemic (N = 10,950)	Pandemic (N = 13,180)
A&E visits	11.8% (1,290)	12.3% (1,620)	0.14	0.14
Community nursing team care	7.8% (850)	8.5% (1,120)	0.13	0.13
Elective admissions	3.0% (330)	2.0%* (260)	0.05	0.04*
Elective bed days	3.0% (330)	2.0%* (260)	0.07	0.06*
Emergency admissions	11.3% (1,240)	12.1% (1,590)	0.13	0.14*
Emergency bed days	11.3% (1,240)	12.1% (1,590)	0.93	1.06*
Medications prescribed	12.1% (1,320)	14.9%* (1,960)	0.43	0.56*
General practice interactions	52.1% (5,710)	59.3%* (7,810)	1.69	2.39*
Outpatient appointments	28.9% (3,160)	26.3%* (3,460)	0.66	0.63*
Outpatient appointments attended	21.2% (2,320)	20.4% (2,690)	0.46	0.47
Palliative care	10.5% (1,150)	12.1%* (1,600)	0.27	0.31*

Dementia and Alzheimer's disease

Table A13: Service use in the last month of life by cohort for deaths at home from dementia and Alzheimer's disease – the proportion with at least one event and average events per person

	Proportion with at least one event (n)		Average events per person	
Service type	Pre-pandemic (N = 1,950)	Pandemic (N = 2,770)	Pre-pandemic (N = 1,950)	Pandemic (N = 2,770)
A&E visits	12.3% (240)	14.8%* (410)	0.14	0.16*
Community nursing team care	20.5% (400)	22.0% (610)	0.33	0.34
Elective admissions	0.5% (10)	0.4% (10)	0.00	0.00
Elective bed days	0.5% (10)	0.4% (10)	0.00	0.02*
Emergency admissions	14.4% (280)	14.8% (410)	0.16	0.16
Emergency bed days	14.4% (280)	14.8% (410)	1.29	1.43*
Medications prescribed	52.8% (1,030)	53.4% (1,480)	1.80	1.83
General practice interactions	72.3% (1,410)	88.1%* (2,440)	2.85	4.50*
Outpatient appointments	16.4% (320)	14.8% (410)	0.49	0.46
Outpatient appointments attended	9.7% (190)	10.5% (290)	0.39	0.39
Palliative care	45.1% (880)	40.4%* (1,120)	1.20	1.02*

Covid-19

Table A14: Service use in the last month of life by cohort for deaths at home from Covid-19 – the proportion with at least one event and average events per person

Comios turo	Proportion with at least one event (n)		Average events per person	
Service type	Pre-pandemic (N = 0)	Pandemic (N = 1,410)	Pre-pandemic (N = 0)	Pandemic (N = 1,410)
A&E visits	-	27.0% (380)	-	0.34
Community nursing team care	-	9.9% (140)	_	0.15
Elective admissions	-	1.4% (20)	-	0.03
Elective bed days	-	1.4% (20)	_	0.05
Emergency admissions	-	28.4% (400)	_	0.33
Emergency bed days	-	28.4% (400)	_	3.26
Medications prescribed	-	21.3% (300)	_	0.74
General practice interactions	-	68.1% (960)	-	2.70
Outpatient appointments	-	25.5% (360)	-	0.57
Outpatient appointments attended	_	19.1% (270)	_	0.38
Palliative care	_	16.3% (230)	_	0.38

Flu and pneumonia

Table A15: Service use in the last month of life by cohort for deaths at home from flu and pneumonia – the proportion with at least one event and average events per person

Comios turo	Proportion with at least one event (n)		Average events per person	
Service type	Pre-pandemic (N = 780)	Pandemic (N = 580)	Pre-pandemic (N = 780)	Pandemic (N = 580)
A&E visits	14.1% (110)	19.0%* (110)	0.16	0.22*
Community nursing team care	7.7% (60)	8.6% (50)	0.12	0.15
Elective admissions	1.3% (10)	1.7% (10)	0.02	0.01
Elective bed days	1.3% (10)	1.7% (10)	0.03	0.01
Emergency admissions	15.4% (120)	19.0% (110)	0.17	0.21
Emergency bed days	15.4% (120)	19.0% (110)	1.40	1.91*
Medications prescribed	15.4% (120)	24.1%* (140)	0.54	0.77*
General practice interactions	53.8% (420)	63.8%* (370)	1.77	2.94*
Outpatient appointments	23.1% (180)	22.4% (130)	0.54	0.61
Outpatient appointments attended	16.7% (130)	17.2% (100)	0.38	0.50*
Palliative care	11.5% (90)	17.2%* (100)	0.31	0.46*

Other respiratory diseases

Table A16: Service use in the last month of life by cohort for deaths at home from other respiratory diseases – the proportion with at least one event and average events per person

Comico turo	Proportion with at least one event (n)		Average events per person	
Service type	Pre-pandemic (N = 2,850)	Pandemic (N = 2,900)	Pre-pandemic (N = 2,850)	Pandemic (N = 2,900)
A&E visits	18.9% (540)	19.7% (570)	0.22	0.23
Community nursing team care	14.0% (400)	14.1% (410)	0.22	0.22
Elective admissions	2.1% (60)	1.7% (50)	0.02	0.02
Elective bed days	2.1% (60)	1.7% (50)	0.03	0.03
Emergency admissions	20.0% (570)	19.7% (570)	0.23	0.22
Emergency bed days	20.0% (570)	19.7% (570)	1.79	1.72*
Medications prescribed	24.2% (690)	27.5%* (800)	0.89	1.01*
General practice interactions	62.5% (1,780)	77.6%* (2,250)	2.33	3.46*
Outpatient appointments	31.9% (910)	30.7% (890)	0.70	0.76*
Outpatient appointments attended	21.1% (600)	23.4%* (680)	0.46	0.57*
Palliative care	21.4% (610)	21.7% (630)	0.52	0.51

All other causes

Table A17: Service use in the last month of life by cohort for deaths at home from all other causes – the proportion with at least one event and average events per person

Convinc turns	Proportion with at least one event (n)		Average events per person	
Service type	Pre-pandemic (N = 6,880)	Pandemic (N = 8,560)	Pre-pandemic (N = 6,880)	Pandemic (N = 8,560)
A&E visits	13.5% (930)	14.7%* (1,260)	0.17	0.18*
Community nursing team care	10.3% (710)	11.4%* (980)	0.16	0.19*
Elective admissions	3.2% (220)	2.2%* (190)	0.06	0.05*
Elective bed days	3.2% (220)	2.2%* (190)	0.11	0.08*
Emergency admissions	12.8% (880)	14.0%* (1,200)	0.14	0.16*
Emergency bed days	12.8% (880)	14.0%* (1,200)	1.04	1.21*
Medications prescribed	23.1% (1,590)	27.7%* (2,370)	0.87	1.07*
General practice interactions	54.9% (3,780)	65.0%* (5,560)	2.04	3.10*
Outpatient appointments	28.3% (1,950)	28.0% (2,400)	0.73	0.79*
Outpatient appointments attended	18.5% (1,270)	21.0%* (1,800)	0.50	0.60*
Palliative care	19.2% (1,320)	20.8%* (1,780)	0.47	0.51*

10 Quality-of-care measures by cause of death

Flu and pneumonia

Table A18: Quality-of-care measures over the last three months of life for people who died at home from flu and pneumonia pre-pandemic and during the pandemic

Quality of earo magging	Proportion with event (n)		
(last three months of life)	Pre-pandemic (N = 780)	Pandemic (N = 580)	
One or more emergency admissions to hospital	26.9% (210)	31.0% (180)	
Three or more emergency admissions to hospital	2.6% (20)	3.4% (20)	
One or more medications prescribed for symptom management by general practice	15.4% (120)	24.1%* (140)	
One or more palliative care codes in GP record	12.8% (100)	20.7%* (120)	

* Significantly different from the pre-pandemic period at the 5% level.

Other respiratory diseases

Table A19: Quality-of-care measures over the last three months of life for people who died at home from other respiratory diseases pre-pandemic and during the pandemic

Quality of ears massure	Proportion with event (n)		
(last three months of life)	Pre-pandemic (N = 2,850)	Pandemic (N = 2,900)	
One or more emergency admissions to hospital	38.6% (1,100)	37.9% (1,100)	
Three or more emergency admissions to hospital	4.9% (140)	3.8%* (110)	
One or more medications prescribed for symptom management by general practice	28.1% (800)	31.6%* (920)	
One or more palliative care codes in GP record	27.7% (790)	27.6% (800)	

All other causes

Table A19: Quality-of-care measures over the last three months of life for people who died at home from other respiratory diseases pre-pandemic and during the pandemic

Quality of each management	Proportion with event (n)		
(last three months of life)	Pre-pandemic (N = 6,880)	Pandemic (N = 8,560)	
One or more emergency admissions to hospital	29.8% (2,050)	30.4% (2,600)	
Three or more emergency admissions to hospital	2.8% (190)	2.8% (240)	
One or more medications prescribed for symptom management by general practice	25.6% (1,760)	30.5%* (2,610)	
One or more palliative care codes in GP record	23.1% (1,590)	24.8%* (2,120)	

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