Emergency department visits by ambulance for people in the last 12 months of life by Integrated Care Board, for deaths in England in 2019 and 2020

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Overview and background

In this brief descriptive analysis, we report rates of emergency department visits where the mode of arrival is by ambulance, for people in the last year of life, for deaths in 2019 and 2020, and explore regional variation.

The Covid-19 pandemic led to a sustained shift in the focus of care for people with life-limiting illnesses. Our earlier analyses showed that home deaths increased during the pandemic[1], but that there was considerable variation in the provision of community support for people with terminal illnesses, and that lack of community services may have contributed to high levels of emergency department use in the last months of life.[2] We also found wide geographical variation in the rate of emergency department visits for people in the last year of life across England.[2]

Prior to the Covid-19 pandemic, it was known that a large proportion of emergency department visits among people in the last year of life occurred by ambulance.[3] Given the current pressures on ambulance services in England, the purpose of this analysis is to describe rates of ambulance conveyance to the emergency department among people in the last year of life, to better understand use of ambulances in the last year of life, changes between 2019 and 2020, and geographical variation.

Data source and access

This analysis uses mortality data linked to Accident and Emergency Hospital Episode Statistics (HES) data. Data were accessed through NHS England's Trusted Research Environment service for England via the British Heart Foundation Data Science Centre.

Data quality

Overall, the proportion of missing data on the variable indicating the arrival mode to the emergency department was 9% for deaths during 2019 and 7% for deaths during 2020. The proportion of missing data was variable across Integrated Care Boards (ICBs). Data is not presented for ICBs where missing data was greater than 10%. Table 1 lists the ICBs that were excluded from the analysis for this reason.

Population and analysis

For each ICB (previously Sustainability and Transformation Partnerships)*, we describe the number of deaths, the number of emergency department visits in the last year of life where ambulance was the mode of arrival, and the age-and-sex-standardised rate of emergency department visits in the last year of life where ambulance was the mode of arrival per 1000 deaths (Figure 1, Table 2), for all deaths that occurred in 2019 and 2020.

*The analysis uses the Sustainability and Transformation Partnership (STP) geography that applied in 2020.

Age and sex standardisation

To help to compare rates between areas, we used the direct method of age-and-sex-standardisation to remove differences in the age and sex structure of the deaths in each ICB. We used 10-year age bands from 0 to 100 (based on age at death), and the age and sex specific number of deaths in 2019 in England as a whole as the standard population.

Table 1: Integrated Care Boards excluded from the analysis, by year. Proportion of missing data is reported in brackets

2019	2020
• Bath and North East Somerset, Swindon and Wiltshire (12%) • Bedfordshire, Luton and Milton Keynes (12%) • Cheshire and Merseyside (13%) • Devon (17%) • Gloucestershire (37%) • Hampshire and the Isle of Wight (12%) • North London Partners in Health and Care (11%) • North West London Health and Care Partnership (11%) • South West London Health and Care Partnership (13%) • Surrey Heartlands Health and Care Partnership (24%)	• Cheshire and Merseyside (16%) • Devon (13%) • Gloucestershire (48%) • North London Partners in Health and Care (11%) • North West London Health and Care Partnership (15%) • South West London Health and Care Partnership (13%) • Surrey Heartlands Health and Care Partnership (23%)

Figure 1: Age and sex standardised rate per 1000 deaths in 2019 and 2020 of ED visits by ambulance in the last 12 months of life, by Integrated Care Board

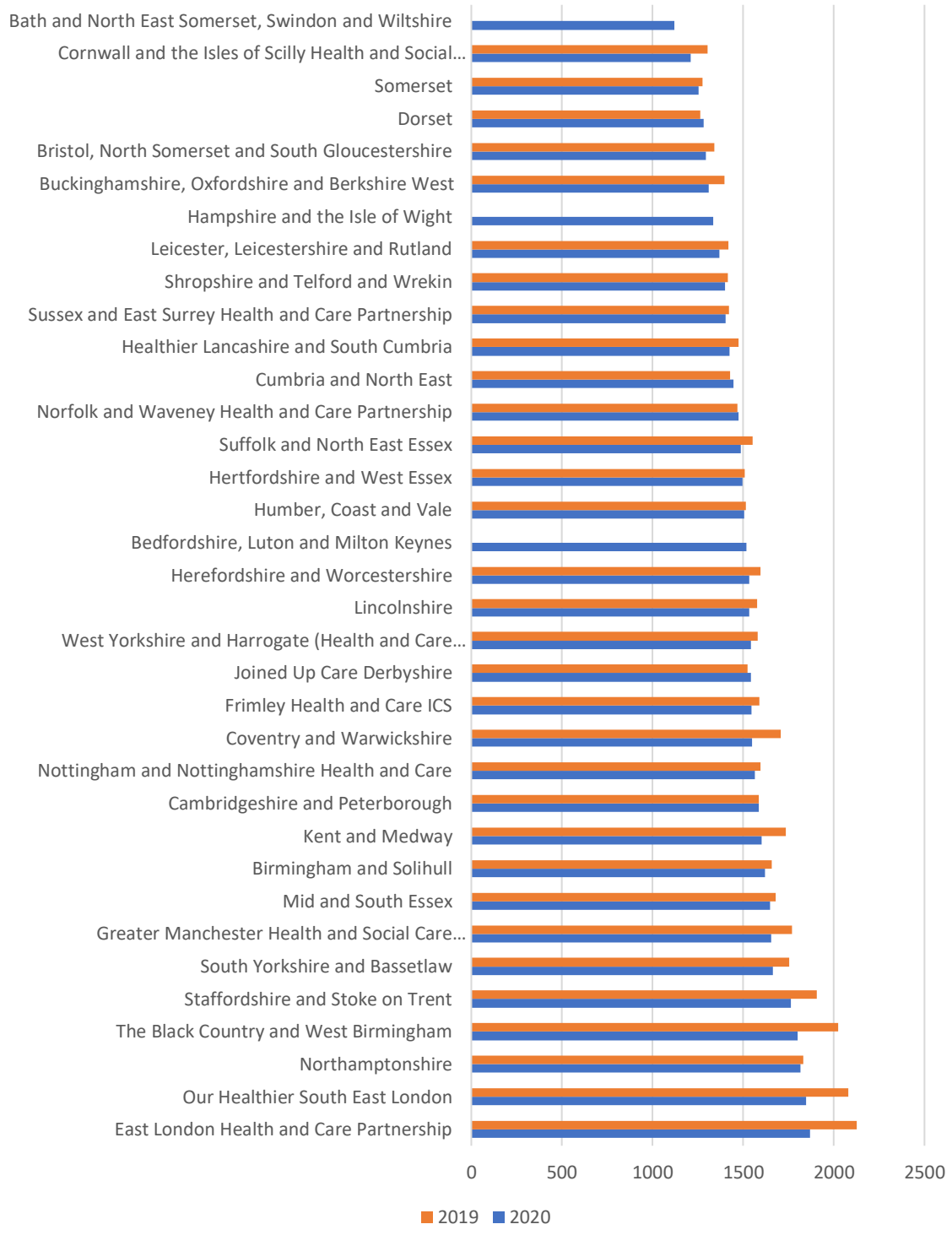

Table 2: Counts of ED visits and deaths in 2019 and 2020 by Integrated Care Board

Integrated Care Board/Sustainability and Transformation Partnership	ed visits by ambulance in last 12 months of life (2020)	deaths in 2020	ed visits by ambulance in last 12 months of life (2019)	deaths in 2019
Bath and North East Somerset, Swindon and Wiltshire	10128	8963	*	7927
Bedfordshire, Luton and Milton Keynes	12250	8031	*	7014
Birmingham and Solihull	18461	11376	15305	9261
Bristol, North Somerset and South Gloucestershire	11263	8616	10527	7798
Buckinghamshire, Oxfordshire and Berkshire West	19709	14889	18645	13222
Cambridgeshire and Peterborough	12586	7812	11558	7245
Cheshire and Merseyside	*	29394	*	26021
Cornwall and the Isles of Scilly Health and Social Care Partnership	7879	6452	8128	6168
Coventry and Warwickshire	14968	9578	14275	8333
Cumbria and North East	52185	35794	45318	31648
Devon	*	13298	*	13097
Dorset	12222	9393	11248	8728
East London Health and Care Partnership	23556	12728	21052	10019
Frimley Health and Care ICS	9360	6017	8538	5334
Gloucestershire	*	6923	*	6245
Greater Manchester Health and Social Care Partnership	48390	29316	43378	24774
Hampshire and the Isle of Wight	25158	18641	*	17065
Healthier Lancashire and South Cumbria	29760	20716	26797	18105
Herefordshire and Worcestershire	14275	9257	13169	8167
Hertfordshire and West Essex	21238	13900	18668	12184
Humber, Coast and Vale	29797	19527	26928	17657
Joined Up Care Derbyshire	17769	11393	15512	10135
Kent and Medway	32261	19918	30047	17161
Leicester, Leicestershire and Rutland	14489	10496	13012	9092
Lincolnshire	14732	9455	13512	8452
Mid and South Essex	20618	12321	18843	11063
Norfolk and Waveney Health and Care Partnership	18673	12412	17119	11444
North London Partners in Health and Care	*	9502	*	7710
North West London Health and Care Partnership	*	13938	*	11228
Northamptonshire	13042	7151	11530	6289
Nottingham and Nottinghamshire Health and Care	16605	10548	15174	9493
Our Healthier South East London	22137	12064	21187	10282
Shropshire and Telford and Wrekin	7949	5629	7163	5028
Somerset	8336	6543	8001	6183
South West London Health and Care Partnership	*	10563	*	8909
South Yorkshire and Bassetlaw	29104	17372	26237	14955
Staffordshire and Stoke on Trent	23469	13178	21452	11230
Suffolk and North East Essex	16606	10956	16012	10114
Surrey Heartlands Health and Care Partnership	*	10131	*	8616
Sussex and East Surrey Health and Care Partnership	27045	19105	25154	17524
The Black Country and West Birmingham	26693	14806	24944	12321
West Yorkshire and Harrogate (Health and Care Partnership)	37366	24173	32808	20880

* numbers not reported due to missing data being >10%

Conclusions and limitations

This analysis highlights that there are a large number of ambulance conveyances to the emergency department among people in their last year of life in England, as well as variation across ICBs.

Most ICBs had lower rates of last-year-of-life ambulance conveyance to the emergency department for deaths that occurred in 2020 than for deaths in 2019. This is likely to reflect a shift towards more community-based care in response to the Covid-19 pandemic, also seen in the increase in the number and proportion of deaths that occurred at home during 2020, something that is still incompletely understood.[1]

After standardising for age and sex, rates of ambulance conveyance to the emergency department varied considerably between ICBs. The variation may reflect differences in the health needs and characteristics of the population (such as levels of morbidity, deprivation and ethnicity), rurality, as well as availability of community services.

We show that a large number of ambulance conveyances to the emergency department occur among people in their last year of life. Many of these people (though not all) will have advanced illnesses. Improved community support (including primary care, community nursing care and community palliative care) can reduce reliance on the acute hospital setting for people in the last months of life.[4-7] These interventions are likely to also reduce the need for ambulance conveyance to the emergency department, though to our knowledge this has not been examined.

It is important to note that we have no information about the appropriateness of ambulance conveyance to the emergency department in this study. While many people living with advanced illness would prefer to remain at home and avoid acute hospital care, some emergency department visits are clinically appropriate and unavoidable.[8, 9] The geographical variation highlighted in our analysis should be explored further using a range of methods to understand more about the reasons for ambulance conveyance to the emergency department in the last year of life.

It is also important to note that this data does not include cases where an ambulance was called, and a decision was taken not to convey the person to hospital. A cohort study among people living with advanced dementia in care homes found that paramedics often provide healthcare for people approaching the end of life that does not lead to acute hospital admissions.[10]

We found that missing data on mode of arrival to the emergency department varies across ICB geographies, with several ICBs having >10% missing data (though fewer ICBs had >10% missing data for deaths in 2020 compared to 2019). Improving consistency of routine data records is important to allow a more complete understanding of this issue.

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The North East - Newcastle and North Tyneside 2 research ethics committee provided ethical approval for the CVD-COVID-UK/COVID-IMPACT research programme (REC No 20/NE/0161) to access, within secure trusted research environments, unconsented, whole-population, de-identified data from electronic health records collected as part of patients' routine healthcare.

The data used in this study are available in NHS England's TRE for England, but as restrictions apply they are not publicly available (https://digital.nhs.uk/coronavirus/coronavirus-data-services-updates/trusted-research-environment-service-for-england). The CVD-COVID-UK/COVID-IMPACT programme led by the BHF Data Science Centre (https://www.hdruk.ac.uk/helping-with-health-data/bhf-data-science-centre/) received approval to access data in NHS England's TRE for England from the Independent Group Advising on the Release of Data (IGARD) (https://digital.nhs.uk/about-nhs-digital/corporate-information-and-documents/independent-group-advising-on-the-release-of-data) via an application made in the Data Access Request Service (DARS) Online system (ref. DARS-NIC-381078-Y9C5K) (https://digital.nhs.uk/services/data-access-request-service-dars/dars-products-and-services). The CVD-COVID-UK/COVID-IMPACT Approvals & Oversight Board (https://www.hdruk.ac.uk/projects/cvd-covid-uk-project/) subsequently granted approval to this project to access the data within NHS England's TRE for England. The de-identified data used in this study were made available to accredited researchers only. Those wishing to gain access to the data should contact bhfdsc@hdruk.ac.uk in the first instance.

The analysis using data in NHS England's TRE for England was performed according to a pre-specified analysis plan published on GitHub, along with the analysis code (https://github.com/BHFDSC/CCU024_03).

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