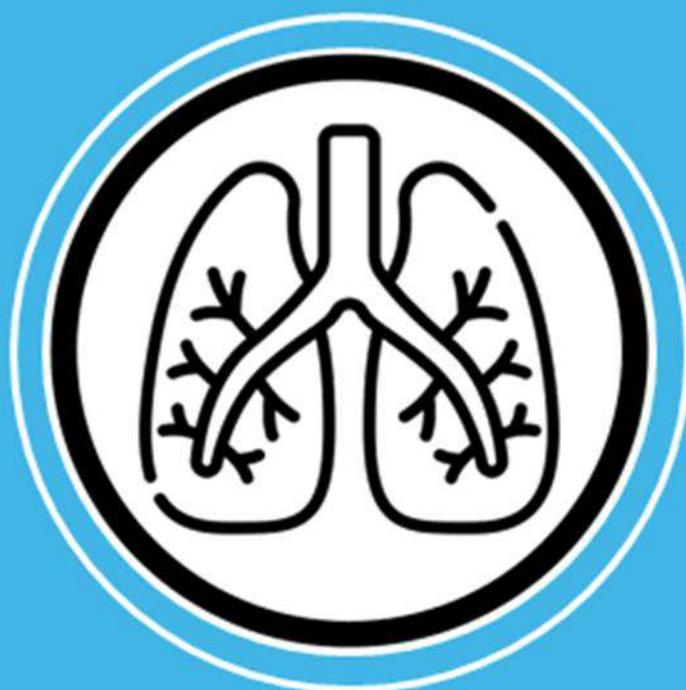


PNEUMONIA: CLOSING THE GAP – A CALL TO ACTION



PRODUCED BY THE ADVANCING QUALITY PROGRAMME, NOVEMBER 2020

INTRODUCTION

The challenges of Covid are well known: a respiratory condition which particularly affects the older and more vulnerable, with a high mortality rate amongst that group and with a 'long tail', where recovery can be protracted. 8,000 people with a Covid diagnosis in North West England died between the start of the outbreak in February 2020 and November 2020.¹

The challenges of pneumonia, which are long-standing and complex, are perhaps less well known. The UK has the third highest age-adjusted death rate for pneumonia in Europe, behind only Romania and Slovakia.² There were 272,000 pneumonia hospitalisations in England in 2019, 42,000 of which were in the North West,³ a rate of 58 per 10,000 population.⁴ 6,700 (16%) died in hospital or within 30 days of discharge.⁵

Like Covid, pneumonia has a 'long tail'. Amongst those who survive until discharge, around 1 in 5 (18%) are back in hospital as an emergency within 30 days. Like Covid, pneumonia disproportionately affects the older and more clinically vulnerable. More than half of those admitted to hospital with pneumonia are aged 75 or older and pneumonia is often accompanied by significant pre-existing conditions, particularly atrial fibrillation, chronic obstructive pulmonary disease (COPD) and hypertension. 18% of pneumonia patients were in hospital in the month before their pneumonia admission and the average pneumonia patient spent 12 days in hospital during the previous year.⁶

Emerging data suggests a correlation between Covid and deprivation, with those in poorer areas more likely to develop Covid and suffer worse outcomes. There is much more data available to clearly evidence the relationship between deprivation and pneumonia. Those in deprived areas are more likely to develop pneumonia and will develop it at a younger age. Consequently, there is a north-south divide in pneumonia. The North West, which contains some of the poorest areas in the country, has the second highest regional rate in England for pneumonia hospital admissions and the highest death rate (adjusted for age and comorbidities).⁷

This report describes the challenges presented by pneumonia in the North West related to age, comorbidities and deprivation. It also discusses the problems caused by imprecise diagnosis and coding, which make it difficult to accurately measure outcomes. Finally, it sets out the work of the Advancing Quality (AQ) programme, which is based on a validated population and a set of key clinical metrics. AQ offers unique insight, analysis and peer comparison, providing a strong foundation for improvement work. It is hoped that some of the positive organisational changes prompted by Covid (such as the breaking down of boundaries between and within institutions, enabling more joined up and innovative approaches) can also be applied to the care of pneumonia patients.

¹ NHS England (2020).

² British Lung Foundation (2015).

³ Healthcare Evaluation Data (2020).

⁴ Office for National Statistics (2019).

⁵ Healthcare Evaluation Data (2020).

⁶ Secondary Uses Service data (2020).

⁷ Healthcare Evaluation Data (2020).

HIGH PNEUMONIA DEATHS PER MILLION POPULATION IN UK



UK
213.9



GERMANY
98.2



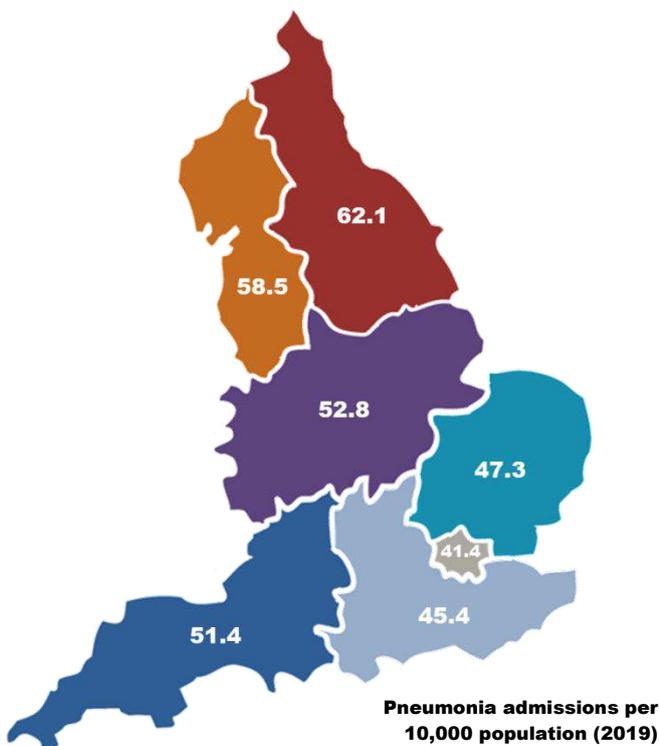
SPAIN
72.2



FRANCE
65.6

Data collated by the British Lung Foundation shows that 213.9 people per million population die as a result of pneumonia in the UK every year.⁸ Age-adjusted pneumonia mortality in the UK is significantly higher than other European countries with comparable population sizes and economic profiles, twice that of Germany and more than three times greater than France. The UK is the third highest in Europe as a whole, behind only Romania and Slovakia. Globally, the UK sits just outside the top twenty.

VARIATION BETWEEN REGIONS: A NORTH/SOUTH DIVIDE

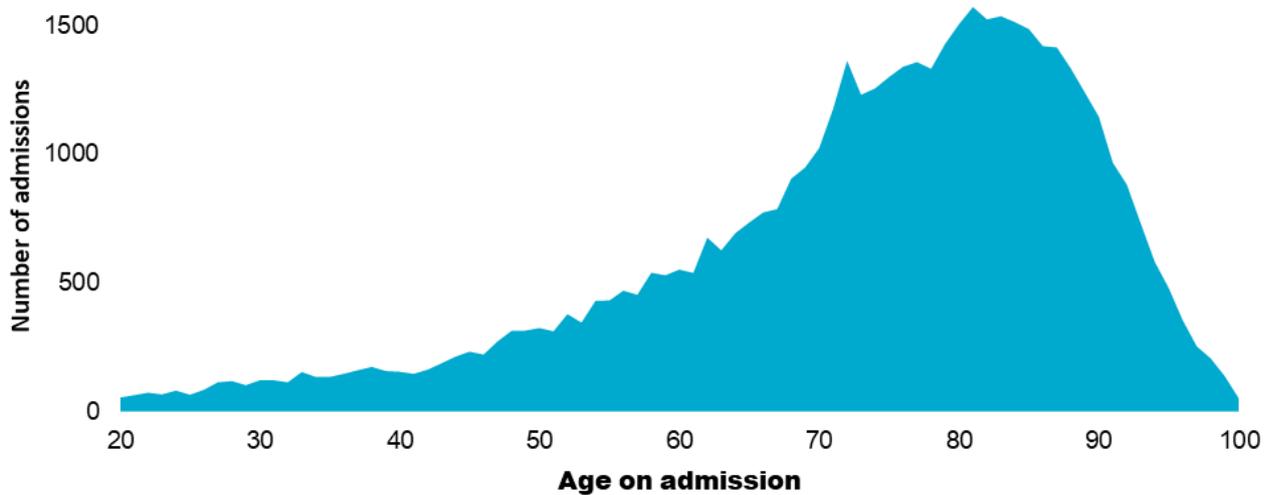


More patients are admitted to hospital as a result of pneumonia in the north of England compared to the south. In the North West in 2019, the rate per 10,000 population was 58.5. It was higher still in the North East, where the rate was 62.1 per 10,000. London had the lowest rate, at 41.4 pneumonia admissions per 10,000 population, followed by the South East with 45.4.⁹

⁸ British Lung Foundation (2015).

⁹ Calculated using data from Statista (2020) and Healthcare Evaluation Data for 2019.

THE CHALLENGES OF AN AGEING POPULATION



More than half (55%) of North West pneumonia hospital patients are aged 75 or older.¹⁰ The Office for National Statistics projects that 1 in 10 of the UK population will be 75 or over by 2025.¹¹ As the population ages, the challenges posed by pneumonia will increase.

PNEUMONIA PATIENTS ARE COMPLEX



24%

**HAVE
ATRIAL FIBRILLATION**



34%

**HAVE
COPD**



38%

**HAVE
HYPERTENSION**

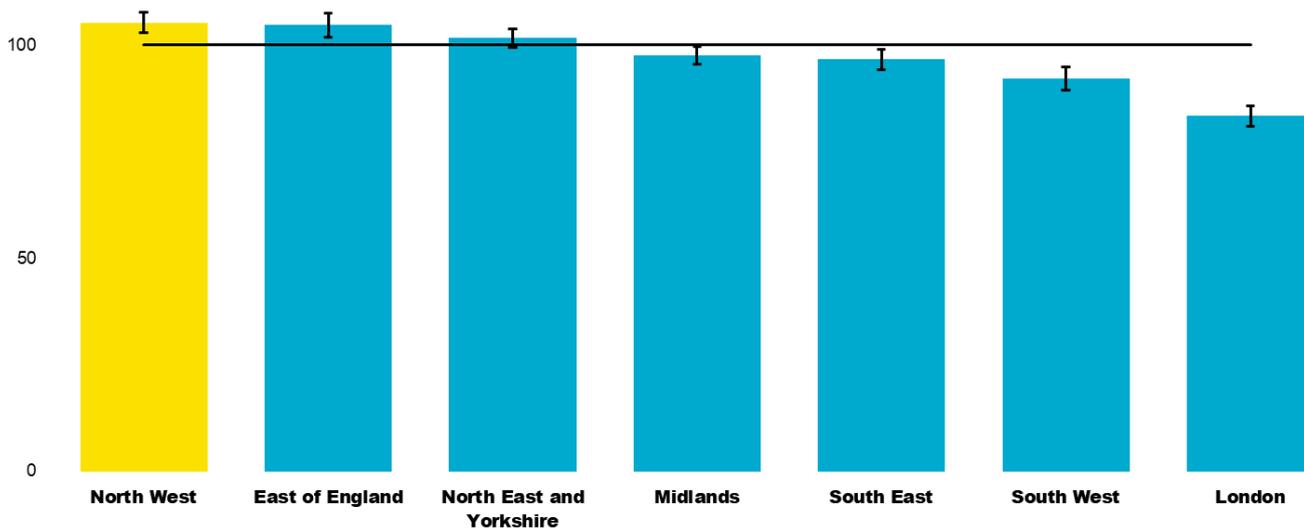
Pneumonia is often accompanied by significant comorbidities. 16% of pneumonia patients die in hospital or within 30 days of discharge and, amongst those alive at discharge, more than 1 in 3 will be back in hospital as an emergency within 30 days.¹² Pneumonia is a condition with a 'long tail' and can be seen as a marker of general poor health. Care of pneumonia patients is not just about treating pneumonia.

¹⁰ Secondary Uses Service data (2020).

¹¹ Office for National Statistics (2019).

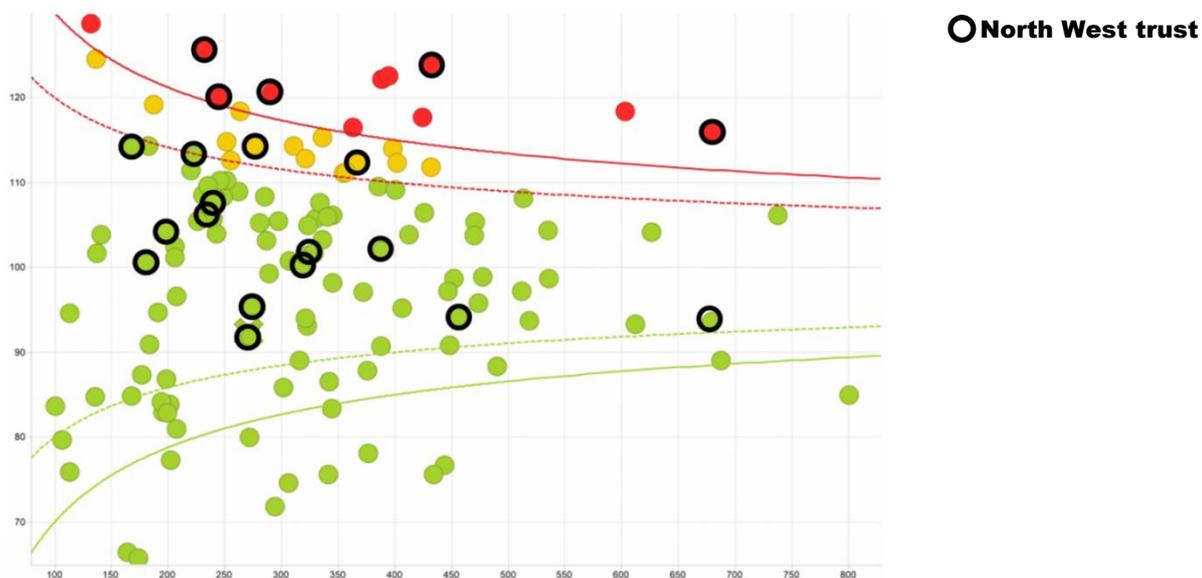
¹² Secondary Uses Service data (2020).

MORE DEATHS THAN EXPECTED



The Summary Hospital-level Mortality Indicator (SHMI) calculates ‘expected deaths’ for a group of patients, accounting for age and comorbidity. A SHMI of 100 means deaths were at the expected level and over 100 indicates more deaths than expected. Upper and lower limits, based on the number of cases, show the range of possible values allowing for variation. The North West was the worst performing region in 2019, with a lower limit above 100, meaning mortality was statistically significantly higher than expected.¹³

FIVE NORTH WEST TRUSTS ARE OUTLIERS FOR MORTALITY

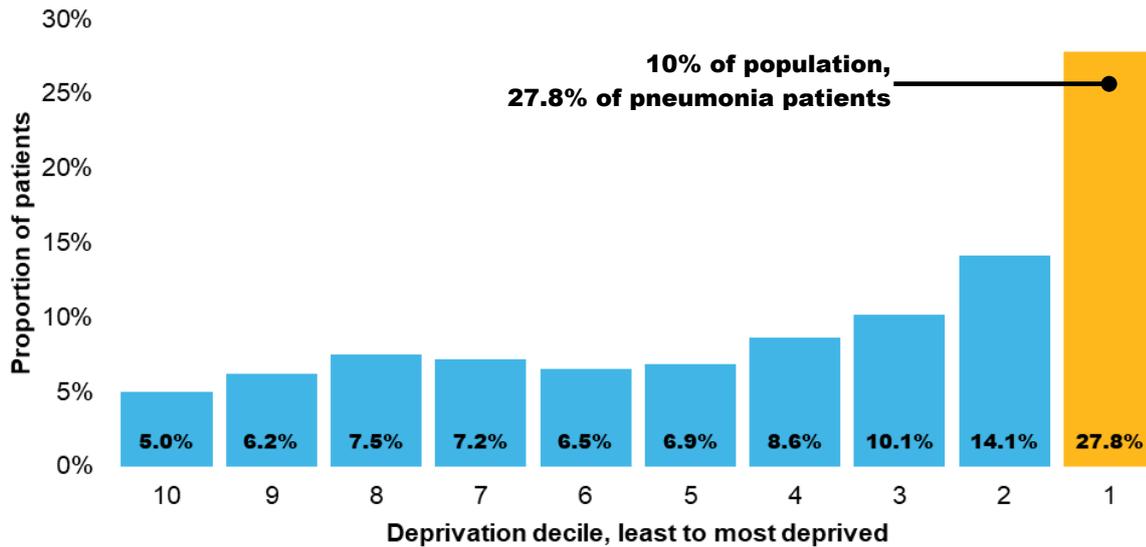


SHMI funnel plots show performance at provider level, with dispersal limits to account for variation. Trusts above the upper limited have statistically higher than expected mortality levels - these outliers are coloured red on the plot. In 2019, 5 North West trusts were outliers.¹⁴

¹³ Healthcare Evaluation Data (2020).

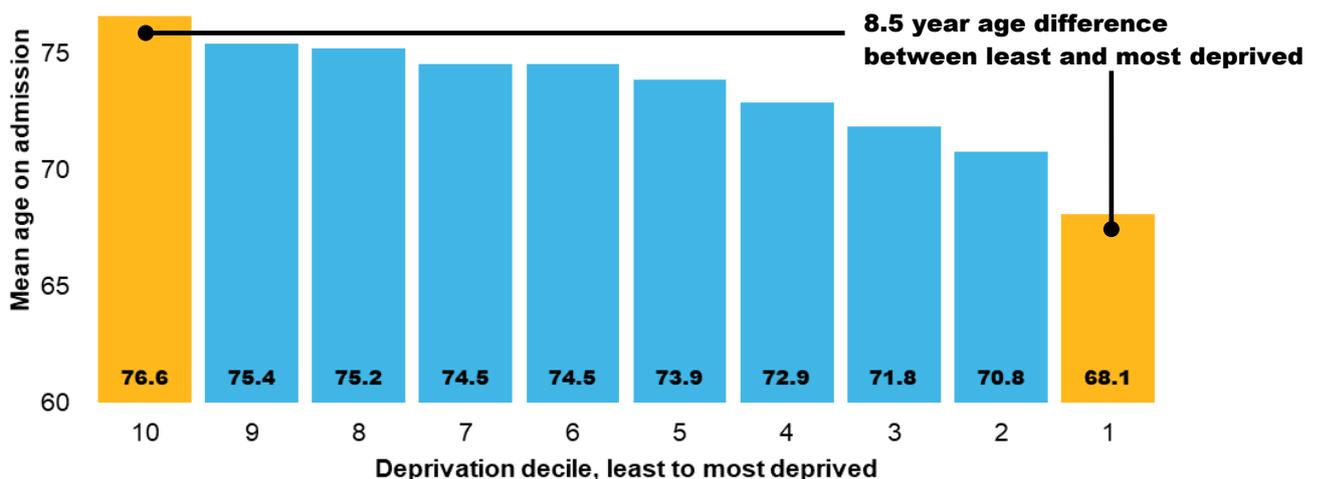
¹⁴ Ibid.

MORE PNEUMONIA IN DEPRIVED AREAS



The Marmot Review shows that the negative impact of deprivation on health begins before birth and is lifelong.¹⁵ The Index of Multiple Deprivation (IMD) measures deprivation using seven domains (income, employment, education, health, crime, housing and the living environment), splitting neighbourhoods into deciles (ten equal-sized segments), from most deprived (1) to least (10).¹⁶ In North West England, more than 1 in 4 (27.8%) of pneumonia hospital admissions come from the most deprived tenth of the population.¹⁷

POORER PATIENTS DEVELOP PNEUMONIA 8 YEARS YOUNGER



Prevalence of pneumonia increases with age, but deprivation complicates this picture, with those living in the most deprived areas developing pneumonia younger. The mean age for pneumonia hospital admissions was 76.6 for patients in the least deprived decile, compared to 68.1 in the most deprived decile.¹⁸

¹⁵ Marmot *et al* (2010).

¹⁶ Ministry of Housing, Communities & Local Government (2019).

¹⁷ Secondary Uses Service data (2020).

¹⁸ *Ibid.*

4 OUT OF 10 PATIENTS ARE INCORRECTLY CODED



Daniel, Bewick *et al* describe the clinical complexities that can make it difficult to accurately diagnose and code pneumonia.¹⁹ AQ uses nationally published data extracted from NHS Digital and an ICD-10 code algorithm to identify pneumonia patients for audit. Trusts validate each case to confirm the diagnosis. In 2019, 43% of AQ patients were excluded because they did not have an abnormal chest x-ray or a confirmed pneumonia diagnosis by the post-take ward round. Outcomes are different for validated patients; in-hospital mortality was 11.3% for validated patients, compared to 15.2% for non-validated patients.²⁰

CARE VARIES FOR KEY METRICS, PARTICULARLY IN ANTIBIOTICS

	Lowest trust	Overall AQ	Highest trust
Oxygen assessment within 4 hours of arrival	99.3%	99.8%	100.0%
Chest x-ray within 4 hours of arrival	71.4%	83.9%	90.3%
Initial antibiotics within 4 hours of arrival	45.6%	69.1%	78.4%
CURB-65	60.2%	73.7%	83.4%
Appropriate antibiotic regime	67.1%	88.8%	98.5%

The AQ measures define good pneumonia care. It reflects British Thoracic Society (BTS)²¹ and National Institute for Health and Care Excellence (NICE) guidance.²² Analysis shows variation between trusts; fewer than 7 in 10 eligible patients received antibiotics within 4 hours. At the lowest performing trust, less than half did.²³

¹⁹ Daniel, Bewick *et al* (2016) p. 376.

²⁰ AQ data (2020). 95% CI for validated (10.6% - 13.2%) and non-validated (14.8% - 15.5%) groups don't overlap.

²¹ British Thoracic Society (2016).

²² NICE (2016); NICE (2019).

²³ AQ data (2020).

6 PNEUMONIA CHALLENGES

1 HIGH VOLUME

More than 40,000 hospital admissions in the North West every year.

2 HIGH MORTALITY

The North West is above the expected level for mortality and five trusts are outliers.

3 THE AGEING POPULATION

More than half of pneumonia patients in the North West are aged 75 or over.

4 MORE PNEUMONIA AT A YOUNGER AGE IN DEPRIVED AREAS

Pneumonia is a socioeconomic as well as a clinical challenge.

5 PNEUMONIA IS ONLY PART OF THE STORY

Pneumonia patients often have other conditions. Readmission rate is nearly 1 in 5.

6 DIAGNOSIS, DOCUMENTATION, CODING

More than 4 out of 10 patients are incorrectly diagnosed.

WHAT AQ CAN OFFER

To meet the challenges of pneumonia, we must first know who our pneumonia patients are. Misdiagnosis is common and patients who are coded incorrectly as pneumonia tend to be older, have more comorbidities and have worse outcomes.²⁴ Nationally reported figures may not give a true picture. The AQ pneumonia programme is based on a validated dataset with misdiagnosed patients excluded, allowing trusts to compare themselves with their peers in a more meaningful way.

In addition to providing robust outcome information, the AQ programme also offers unique insights using 5 key clinical metrics, which reflect national guidance and provide a definition of what good care looks like for a pneumonia patient. This allows AQ to pinpoint unwarranted variation and identify improvement opportunities.

AQ participation includes tailored support from improvement advisors, as well as specialist analysis and reporting. If you are interested in learning more about AQ, please email advancing.quality@nhs.net.

²⁴ Daniel, Bewick *et al* (2016), p. 377.

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LINKS

- [1] The Advancing Quality Alliance <https://aqua.nhs.uk/>
Information about AQuA and quality improvement.
- [2] Patient Intelligence and Quality System (PIQS) <https://piqs.gemcsu.nhs.uk/>
The AQ data collection and reporting system, with information about the programme's Community Acquired Pneumonia clinical focus area.

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The Advancing Quality Programme

November 2020

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