

CARDIOVASCULAR DISEASE IN LEICESTER ADULTS: JOINT STRATEGIC NEEDS ASSESSMENT

A Joint Strategic Needs Assessment (JSNA) is a statutory process by which local authorities and commissioning groups assess the current and future health, care and wellbeing needs of the local community to inform decision making.

The JSNA:

Is concerned with wider social factors that have an impact on people's health and wellbeing such as poverty and employment.

Looks at the health of the population with a focus on behaviours which affect health, such as smoking, diet and exercise.

Provides a view of health and care needs in the local community

Identifies health inequalities

Indicates current service provision

Identifies gaps in health and care services, documenting unmet needs



Cardiovascular Diseases (CVD)

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1 INTRODUCTION

Cardiovascular diseases (CVDs) are a group of disorders of the circulatory system (heart and blood vessels). They include:

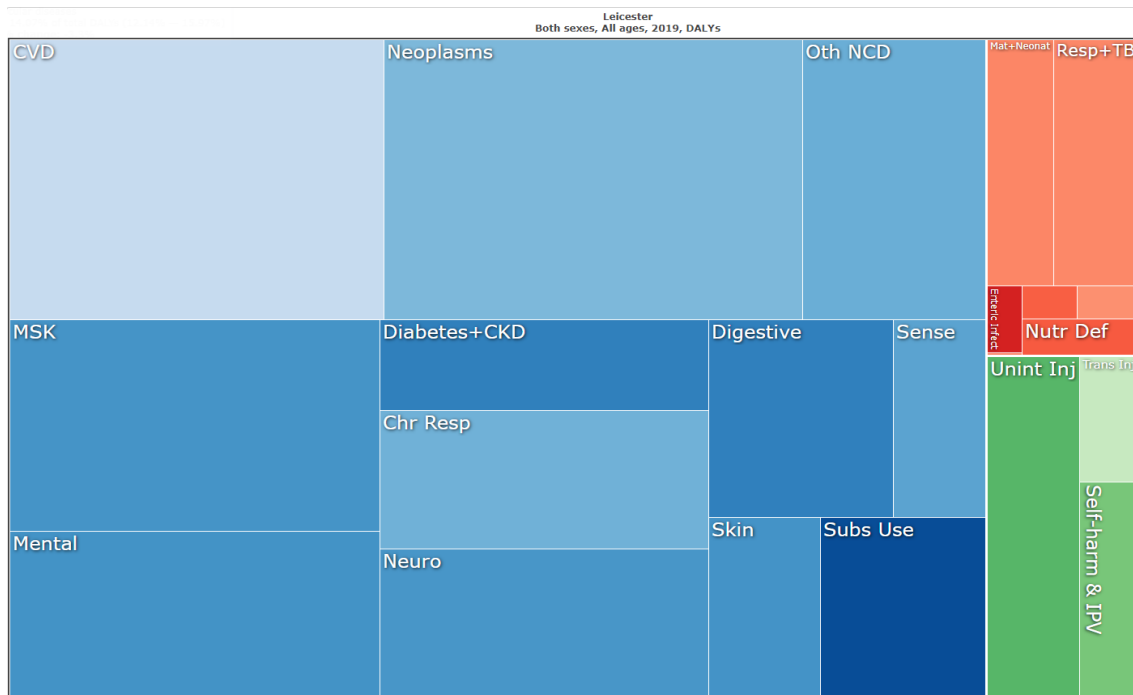
- Coronary Heart Disease (CHD) – disease of the blood vessels supplying the heart muscle
- Cerebrovascular Disease - disease of the blood vessels supplying the brain, which can cause stroke and transient ischaemic attacks (sometimes referred to as mini strokes)
- Peripheral Arterial Disease (PAD) – disease of blood vessels supplying the arms and legs
- Rheumatic Heart Disease – damage to the heart muscle and heart valves from rheumatic fever, caused by streptococcal bacteria
- Congenital Heart Disease - malformations of heart structure existing at birth
- Deep Vein Thrombosis (DVT) and pulmonary embolism – blood clots in the leg veins, which can dislodge and move to the heart and lungs.

Heart attacks and strokes are usually acute events and are mainly caused by a blockage that prevents blood from flowing to the heart or brain. The most common reason for this is a build-up of fatty deposits on the inner walls of the blood vessels that supply the heart or brain. Strokes can also be caused by bleeding from a blood vessel in the brain or from blood clots.¹

This JSNA chapter gives a broad overview of cardiovascular disease in Leicester, with more detailed sections on cardiovascular conditions which are major causes of death (coronary heart disease, stroke), and common cardiovascular conditions which cause complications and increase risk of more severe disease (hypertension, atrial fibrillation, high cholesterol).

In Leicester, cardiovascular disease (CVD) is the most common cause of death and a significant cause of morbidity in the population. CVD is estimated to be responsible for 14% of life years spent in ill-health, second only to cancer (Figure 1).²

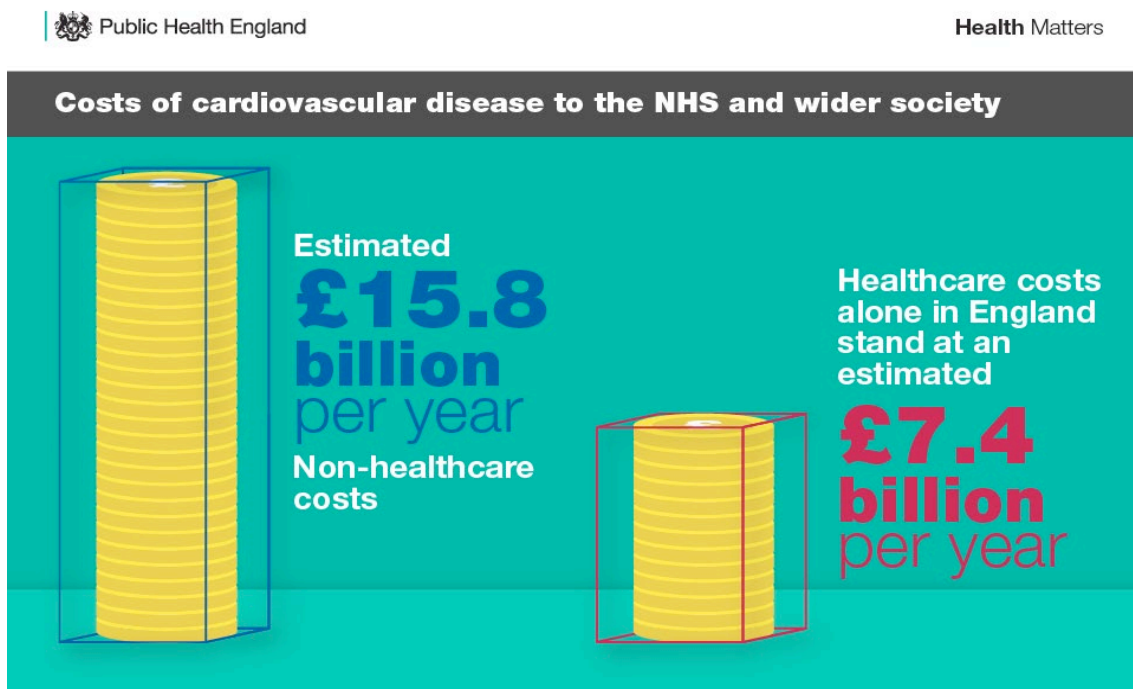
Figure 1: Causes of Disability-adjusted life years in Leicester (2019)



Source: Global Burden of Disease, DALYs by cause, (2019)

CVD morbidity places a considerable financial burden on the NHS and wider society (Figure 2).³

Figure 2: Costs of cardiovascular disease to the NHS and wider society in England (2019)



Source: Public Health England, Health matters: preventing cardiovascular disease, 2019

2 WHO'S AT RISK AND WHY?

The underlying cause of cardiovascular disease (CVD) is plaques of atheroma that form in the walls of blood vessels. There are many risk factors that increase the likelihood of forming atheroma, and its rate of development.

Unmodifiable risk factors:⁴

- with increasing age
- in men, rather than women
- in those with a family history, particularly when close relatives are affected
- in certain ethnic groups, such as South Asian or Black
- in populations with high socio-economic deprivation, in poor housing or with low educational attainment

Modifiable risk factors for cardiovascular disease include:

- unhealthy diet
- physical inactivity
- overweight and obesity
- smoking
- excessive alcohol consumption

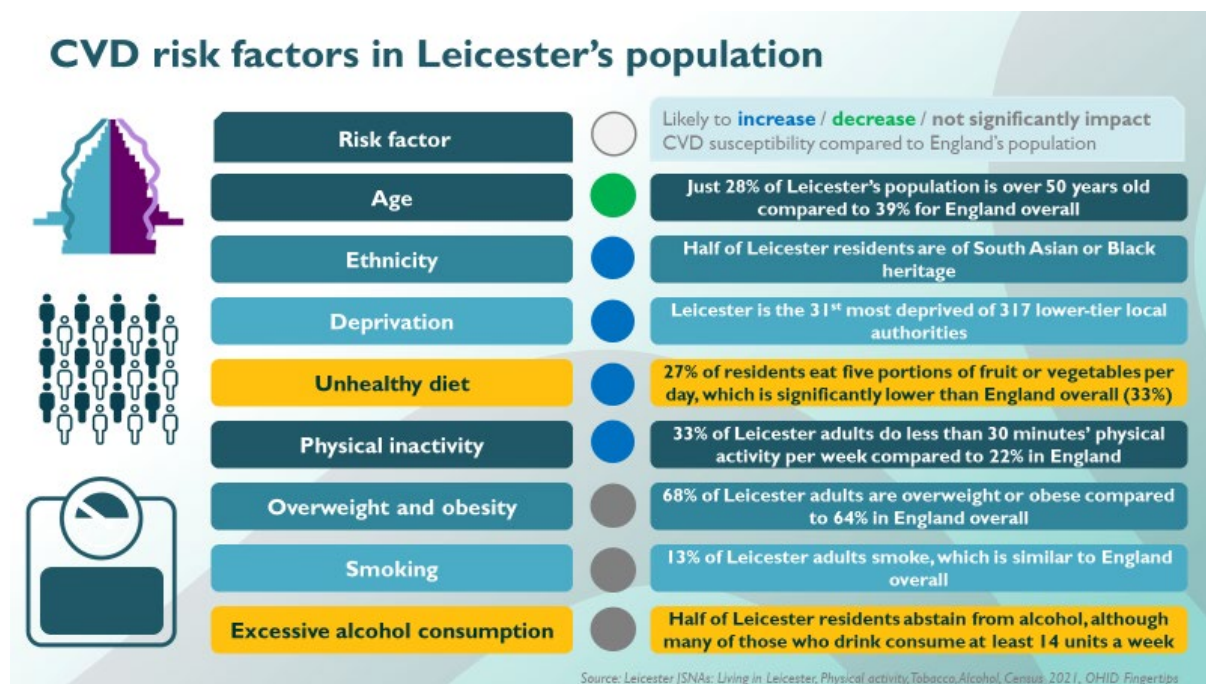
The effects of unhealthy diet and physical inactivity may lead, in susceptible individuals, to high blood pressure, raised blood glucose or abnormal blood lipids (particularly high triglyceride with low HDL). These are called intermediate (or metabolic) risk factors and are largely treatable once detected.

The overall risk of cardiovascular disease in any individual depends on the combination and the level of distinct factors; all aspects of lifestyle and laboratory findings need to be considered and kept under review.

2.1 RISK FACTORS IN LEICESTER'S POPULATION

Leicester's population is younger than England and cultural factors associated with the city's diverse population mean fewer people drink alcohol. These characteristics may reduce the risk of CVD in the city's population compared to England. Characteristics of Leicester's population which may increase the risk of CVD in residents compared to England include the city's large South Asian or Black populations, poor diet, high levels of physical inactivity, and high levels of deprivation.

Figure 3: CVD risk factors in Leicester's population



Sources: Census 2021, OHID Fingertips, Leicester JSNAs: Living in Leicester, Physical activity, Tobacco, Alcohol

2.2 CO-MORBIDITIES

A co-morbidity is the occurrence of more than one illness or disease in a person at the same time. Presence of one illness can increase the risk of developing others. Illnesses affecting the renal and metabolic systems have a significant bearing on cardiovascular health.

- Chronic kidney disease (CKD) – kidney damage causes increased production of the hormones that control blood pressure, leading to high blood pressure (hypertension). This puts an additional strain on the heart and can, in the long run, cause heart failure. High blood pressure also increases the risk of damage to the arteries (atherosclerosis).⁵ There are 8,237 patients (age 18+) with CKD on Leicester GP practice registers. The adult prevalence of CKD is lower in Leicester (2.5%) than England (4%).⁶

- Diabetes mellitus – Build up of unused glucose in the blood can lead to damage to the arteries, making it easier for fatty deposits to build up on artery walls and increasing the likelihood of a blockage.⁷ 33,585 people (aged 17+) registered with a Leicester GP have diabetes.⁸ Leicester has the highest prevalence of diabetes of all ICB sub-locations at 9.9% compared to 7.3% for England, and prevalence has increased significantly in recent years.

Other comorbidities that can increase the risk of developing CVD include:⁹

- Dyslipidaemia - imbalance of lipids such as cholesterol, low-density lipoprotein cholesterol (LDL-C), triglycerides, and high-density lipoprotein (HDL.)
- Rheumatoid arthritis
- Influenza
- Serious mental health problems
- Periodontitis

3 THE LEVEL OF NEED IN THE POPULATION

3.1 CARDIOVASCULAR DISEASES

3.1.1 CVD PREVALENCE

Figure 3 shows the prevalence of the most common cardiovascular diseases in Leicester, Leicester, Leicestershire, and Rutland (LLR) Integrated Care Board (ICB) sub-locations, and England. Hypertension (high blood pressure) is the most common condition, affecting at least 12% of the population in Leicester. Other conditions, such as Coronary Heart Disease (CHD) and stroke have a lower prevalence but a greater impact on the lives of those living with them.

The prevalence of hypertension (12.2%), CHD (2.3%), stroke or TIA (1.2%), atrial fibrillation (1.1%) and heart failure (0.8%) in the Leicester City GP registered population is significantly below the prevalence in England. The prevalence of CHD in Leicester has shown a significant decreasing trend over the most recent years, whilst the prevalence of heart failure has shown a significant increasing trend.

Compared to the other LLR ICB sub-locations, Leicester has a lower diagnosed prevalence for all cardiovascular conditions. The city's relatively young population compared to Leicestershire and Rutland likely contributes to this gap as prevalence is not age-standardised.

Figure 3: Crude prevalence of cardiovascular diseases in LLR ICB sub-location GP registered population, 2021/22

Long-term condition	Leicester count	QOF prevalence by IC sub-location				
		Leicester (04C)	West Leicestershire (04V)	East Leicestershire and Rutland (03W)	LLR ICB	England
Hypertension	52,211	12.2%	14.9%	16%	14.3%	14.0%
Coronary heart disease	9,951	2.3%	2.8%	3.2%	2.7%	3.0%
Stroke or TIA	5,237	1.2%	1.9%	2.0%	1.7%	1.8%
Atrial fibrillation	4,532	1.1%	2.3%	2.7%	2.0%	2.1%
Heart Failure	3,567	0.8%	1.3%	1.3%	1.1%	1.0%

Source: Quality Outcomes Framework (QOF), 2021/22

Statistically significantly higher than England
Statistically significantly below England

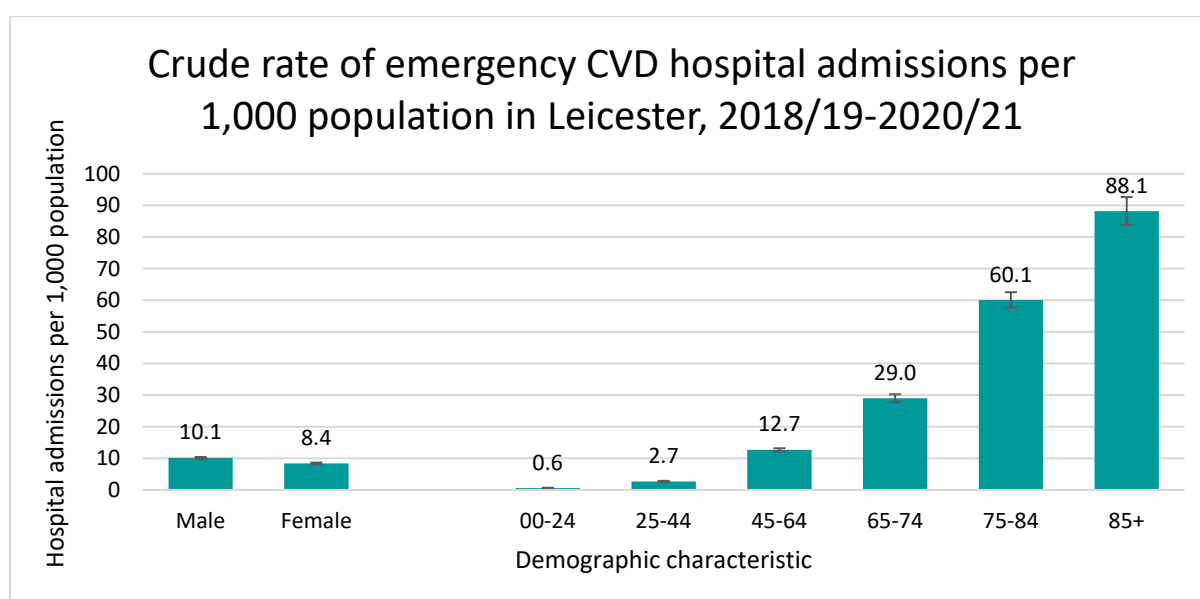
Trend, last five years	
	Increasing
	No Significant Change
	Decreasing

3.1.2 CVD HOSPITAL ADMISSIONS

Between 2018/19 and 2020/21 there were over 13,000 hospital admissions due to CVD in Leicester. Of these, 73% were emergency admissions and the remainder were planned admissions. Of the emergency CVD admissions, 22% were for CHD, 20% were for heart failure, 15% for stroke, 10% for atrial fibrillation and 4% for hypertension.

Figure 4 below shows the emergency hospital admission rates for CVD by age and sex in Leicester between 2018/19 and 2020/21. Rates are significantly higher in men than women and increase significantly with each increase in age band.

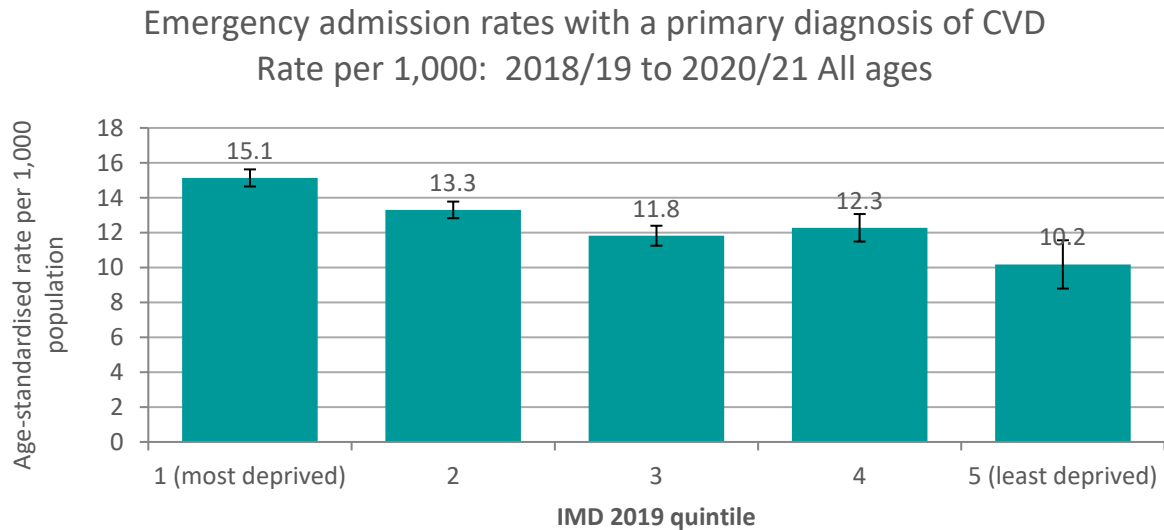
Figure 4: Emergency hospital admission rates for cardiovascular diseases by age and sex in Leicester, 2018/19-2020/21



Data: NHS-Digital: Hospital episode Statistics; ONS: mid-year population estimates (2018-2020)

Figure 5 shows a deprivation gradient for emergency CVD hospital admission rates. The rate is significantly higher in Leicester’s most deprived areas, at 15.1 admissions per 1,000 population, and is lowest in Leicester’s least deprived areas (10.2 per 1,000 population).

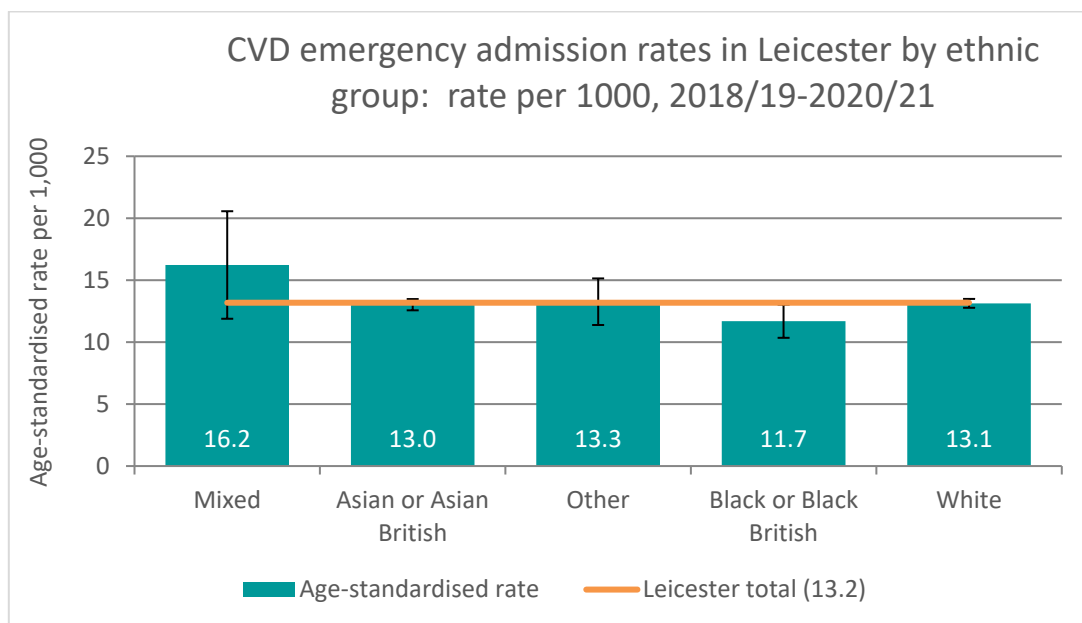
Figure 5: Age-standardised emergency hospital admission rates for cardiovascular diseases by deprivation quintile in Leicester, 2018/19-2020/21



Data: NHS-Digital Hospital episode Statistics; Index of Multiple Deprivation 2019

There are no statistically significant differences for emergency CVD hospital admissions by broad ethnic group.

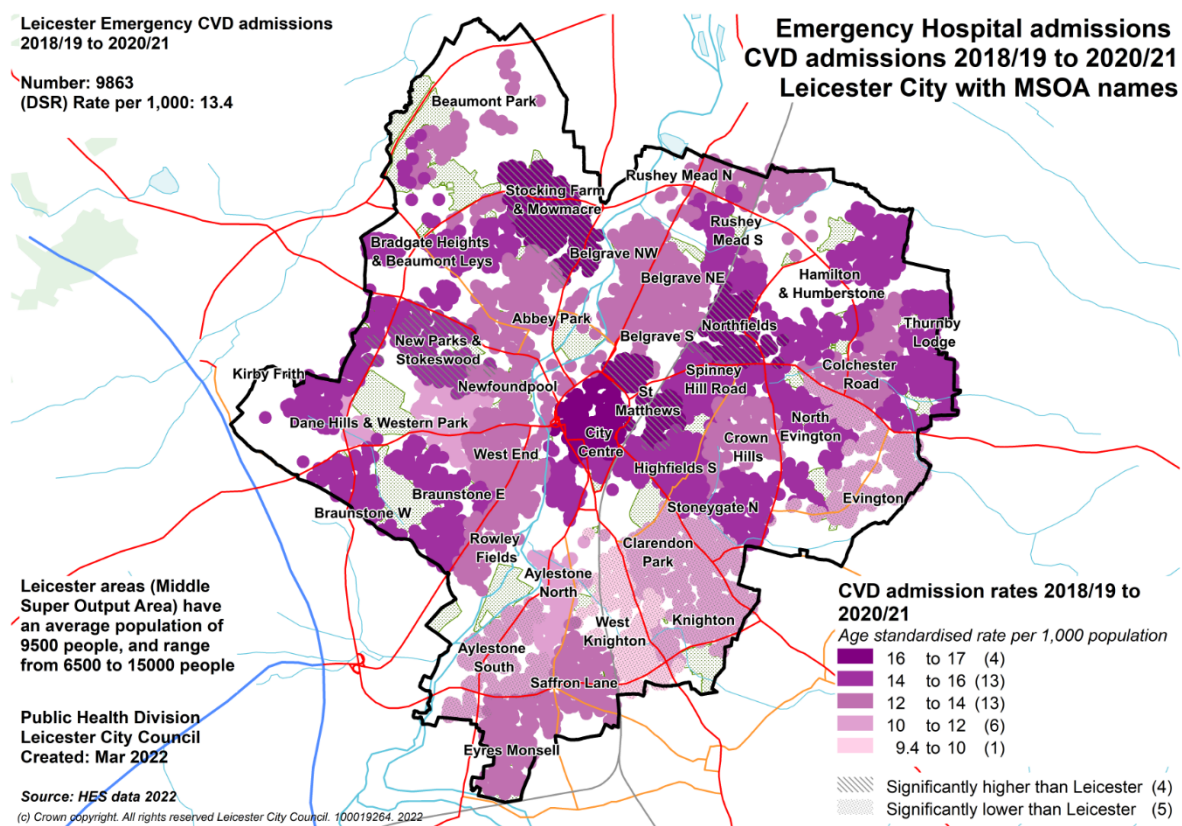
Figure 6: Age-standardised emergency hospital admission rates for cardiovascular diseases by broad ethnicity, 2018/19-2020/21



Data: NHS-Digital: Hospital episode Statistics; Census 2021 population estimates

The map below shows that Middle Layer Super Output Areas (MSOAs) in the city centre and east of the city have some of the highest rates of CVD emergency hospital admissions. Stocking Farm & Mowmacre, Northfields & Merrydale, New Parks & Stokeswood and St Matthews & Highfields North MSOAs had rates which were significantly higher than Leicester overall. Evington, Clarendon Park & Stoneygate South, Knighton, Aylestone South and West Knighton had rates which were significantly lower than Leicester for the 2018/19-2020/21 period.

Figure 7: Emergency hospital admission age-standardised rates for Cardiovascular diseases by MSOA in Leicester, 2018/19 to 2020/21



Data: NHS Digital: Hospital episode Statistics

3.1.3 CVD MORTALITY

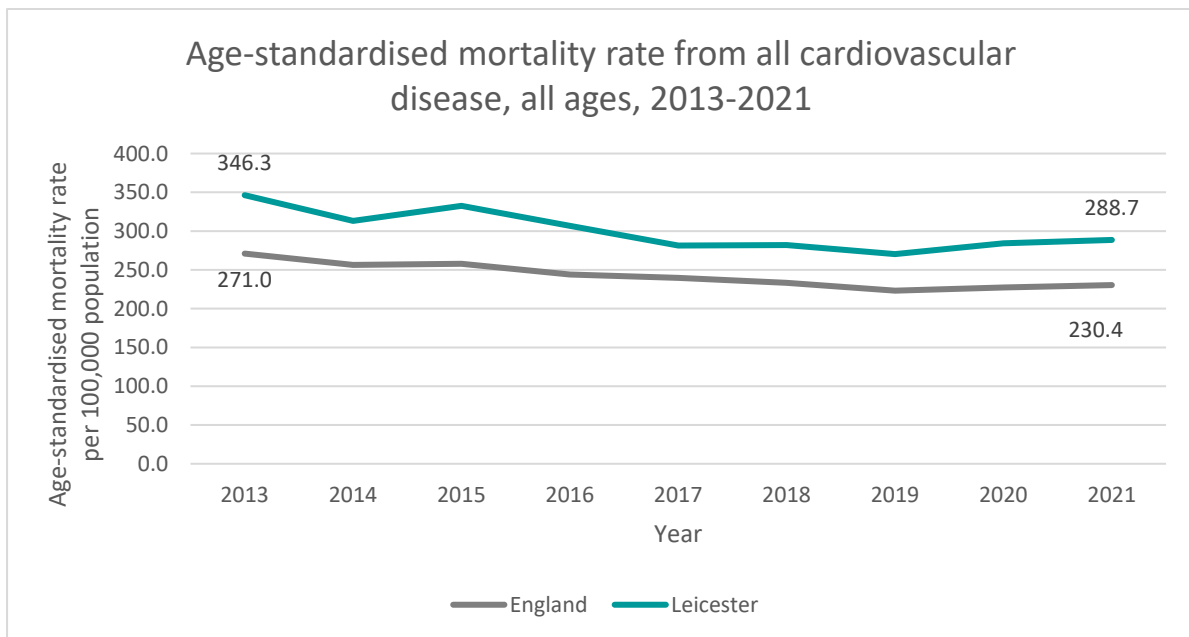
In 2021 there were 663 deaths from CVD in Leicester, accounting for 22.3% of all deaths, which is similar to the proportion for England overall (22.8%).¹⁰ Cardiovascular diseases are the most common cause of death, closely followed by cancer (20.6%).

Of all deaths from CVD in Leicester, around half are from coronary heart disease and almost a sixth are from strokes. Numerous less common underlying causes of death are also

indicated as contributing to CVD mortality. These include heart failure, hypertensive diseases, atrial fibrillation and flutter, and pulmonary embolism.

The age-standardised CVD mortality rate is statistically significantly higher in Leicester (288.7) than England (230.4).¹¹ In both areas, the overall CVD mortality rate has declined since 2013.

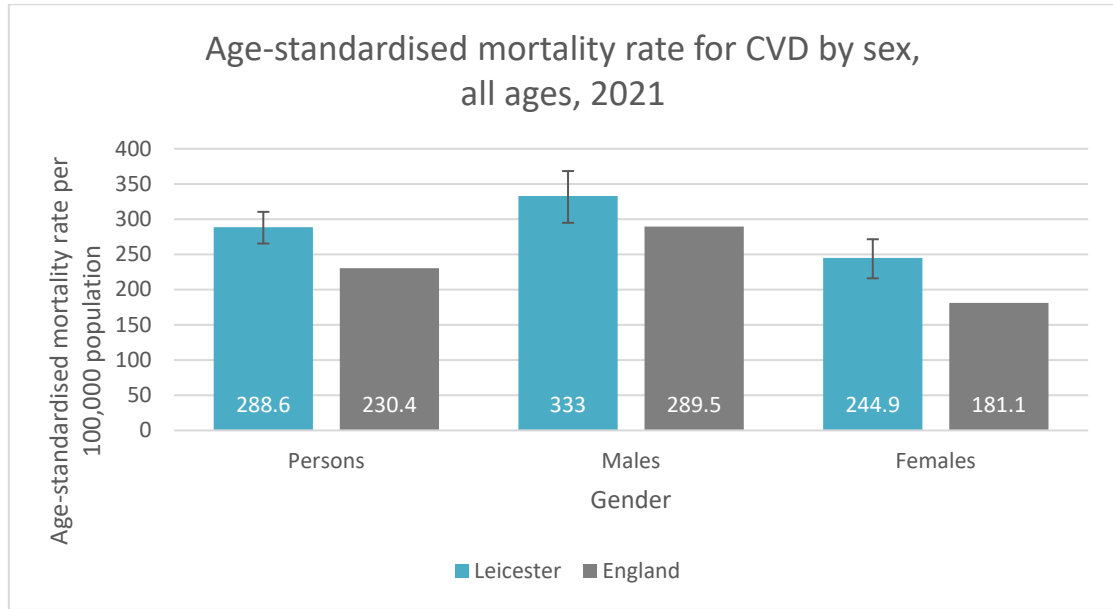
Figure 8: Age-standardised mortality rate from all cardiovascular disease, 2013-2021



Data: ONS, Mortality Statistics: Underlying cause of death: I00-I99, Nomis

CVD mortality is significantly higher in men than women nationally and in Leicester. For both men and women, Leicester’s CVD mortality rate is significantly higher than for England, as shown in Figure 9 below.

Figure 9: Age-standardised mortality rate from all cardiovascular disease by sex, 2021



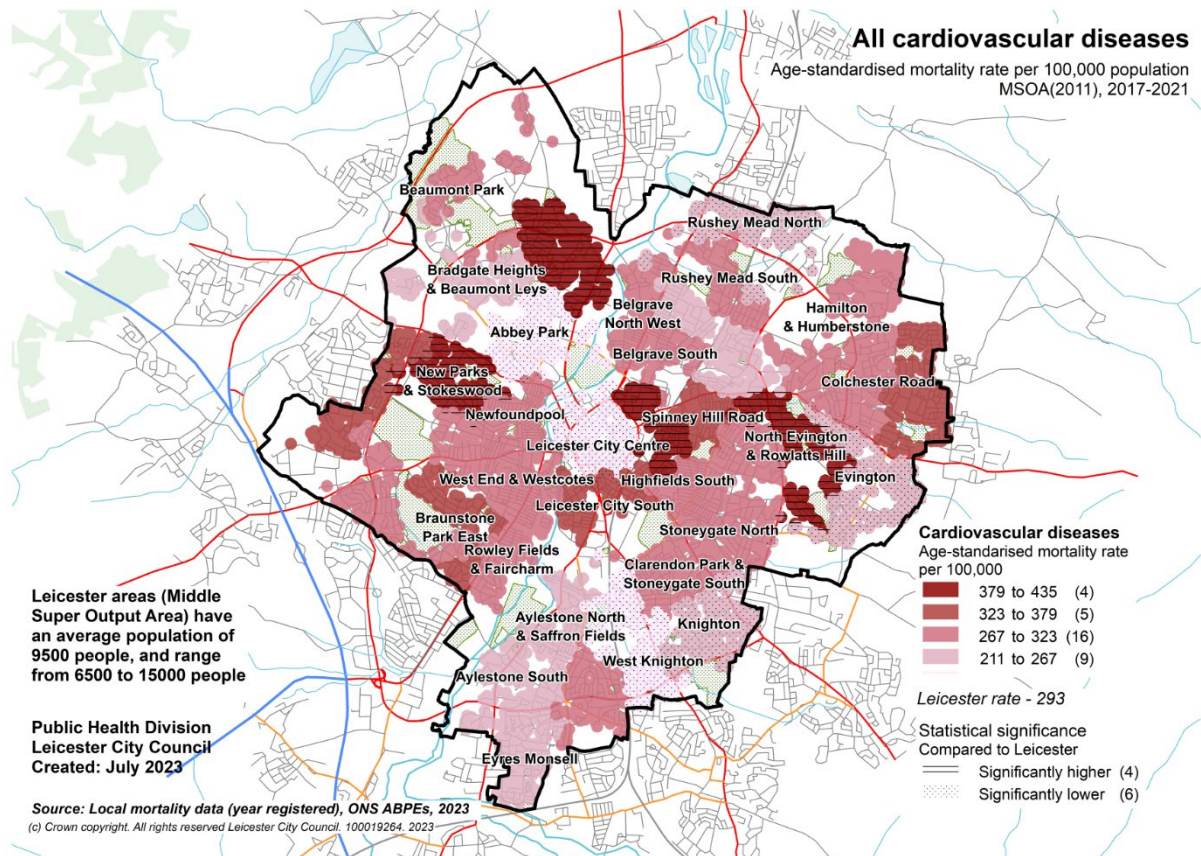
Data: OHID, Fingertips, mortality rate from all cardiovascular diseases 2021

In 2021, CVD was the second largest contributor to the adverse life expectancy gap between Leicester and England after COVID-19, accounting for 19.8% of the life expectancy gap in males and 28.3% in females.¹² This means that if Leicester had the same rate of CVD mortality as England, both men and women could expect to live than more than eight months longer.

Variation across Leicester

The map below shows the variation in CVD mortality across Leicester. Age-standardised rates are highest in New Parks & Stokeswood, Mowmacre & Stocking Farm, St Matthews & Highfields North, and North Evington & Rowlatts Hill.

Figure 10: Cardiovascular disease mortality rates in Leicester by MSOA, 2017-2021



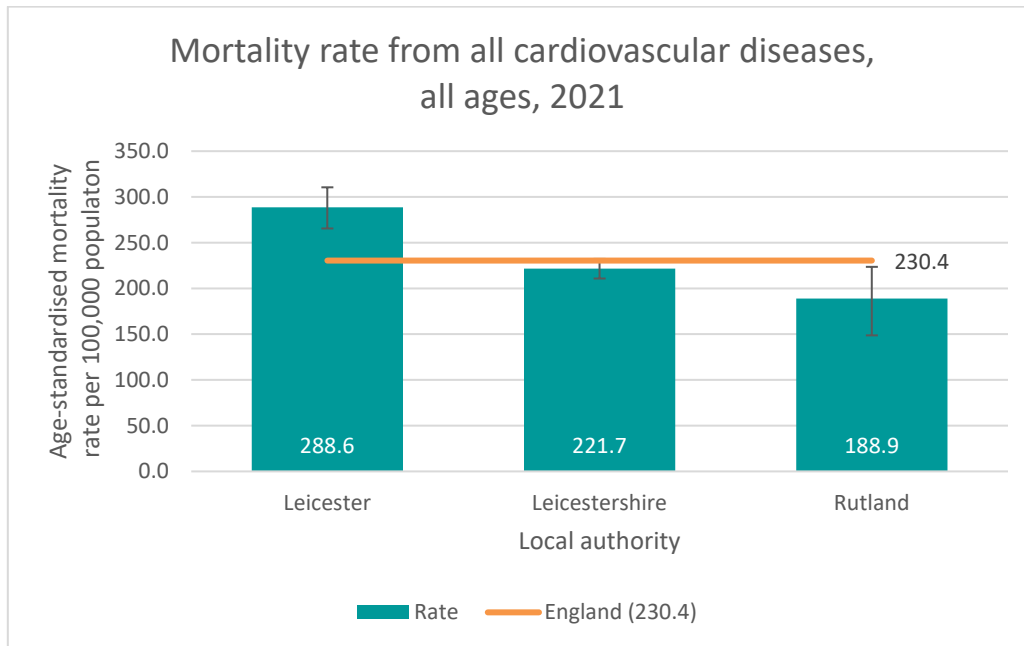
Source: Local mortality data, ONS admin-based population estimates 2023

3.1.3.1 CVD MORTALITY IN LEICESTERSHIRE, LEICESTERSHIRE, AND RUTLAND

As shown by Figure 11, Leicester (288.6) has a significantly higher CVD mortality rate than the other local authority areas which make up the LLR ICB geographical footprint. Leicestershire (221.7) has a similar rate of CVD mortality to England, while Rutland's (188.9) is statistically significantly lower.

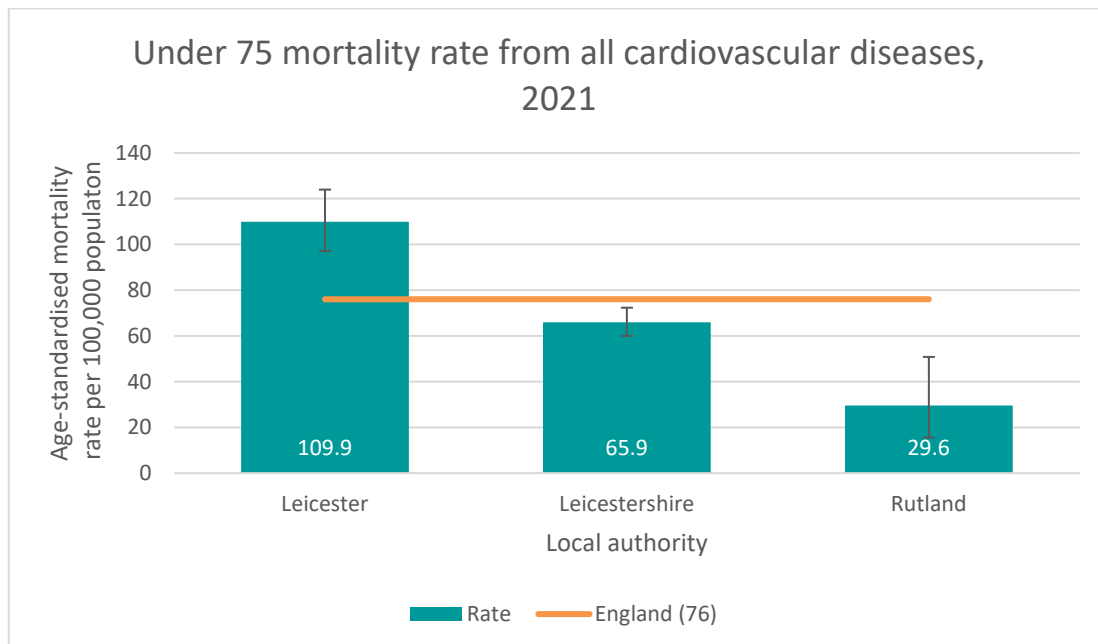
When only CVD mortality in under 75s is considered, as in Figure 12, there is an even larger disparity between Leicester, Leicestershire and Rutland. Leicester (109.9) is among the ten worst authorities in England by this measure while Leicestershire (65.9) and Rutland (29.6) rates are significantly better than England overall. This means more Leicester residents die prematurely from CVD compared to England and other, less deprived areas.

Figure 11: Cardiovascular disease mortality rates Leicester, Leicestershire, and Rutland, 2021



Source: OHID, Fingertips, Mortality rate from all cardiovascular diseases, all ages, 2021

Figure 12: Under 75 cardiovascular disease mortality rates Leicester, Leicestershire, and Rutland, 2021



Source: OHID, Fingertips, Under 75 mortality rate from all cardiovascular diseases, 2021

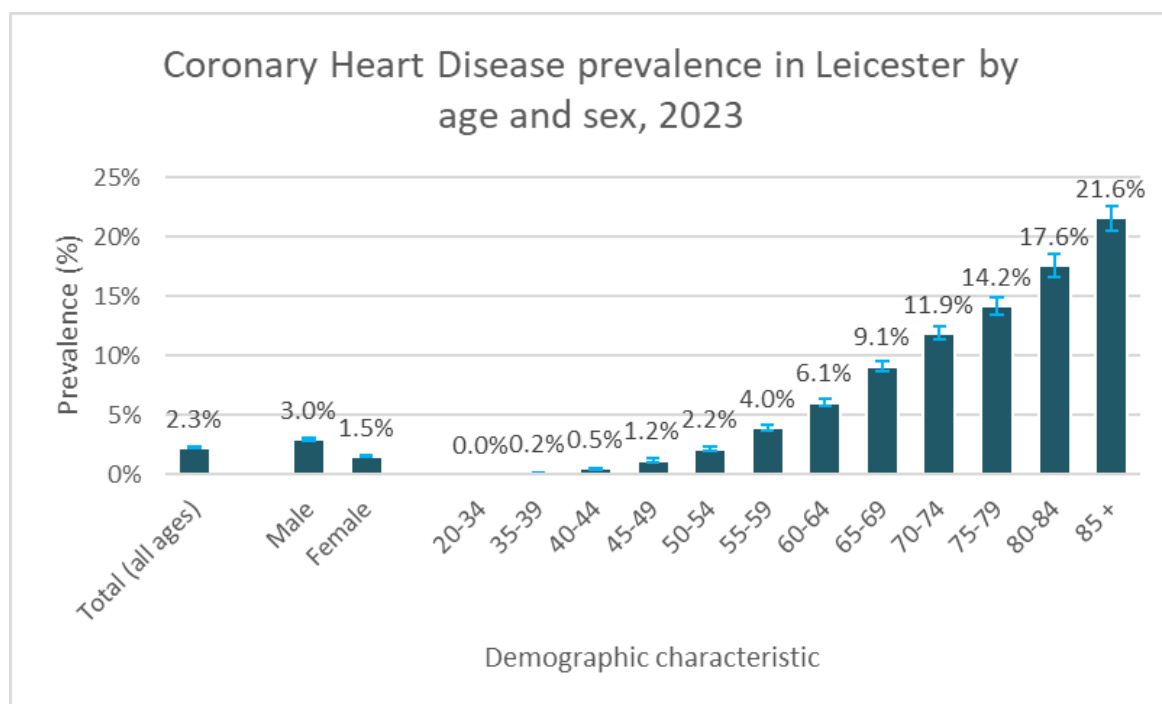
3.2 CORONARY HEART DISEASE

Coronary heart disease (CHD) is a form of CVD caused by the narrowing and blockage of arteries supplying the heart which can result in angina, chest pain or a myocardial infarction (heart attack), often complicated by disorders of heart rhythm (arrhythmia). The outcome can be acute heart failure, sudden death or slower progression to chronic heart failure.

3.2.1 CHD PREVALENCE

There are just under 10,000 patients diagnosed with CHD on GP registers in Leicester, equivalent to 2.3% of the population. This is lower than the national prevalence of 3.0%.¹³ Figure 13 below shows the prevalence of CHD in Leicester is significantly higher in men than in women and that prevalence significantly increases with age, with very few diagnosed cases in residents under 45 years old.

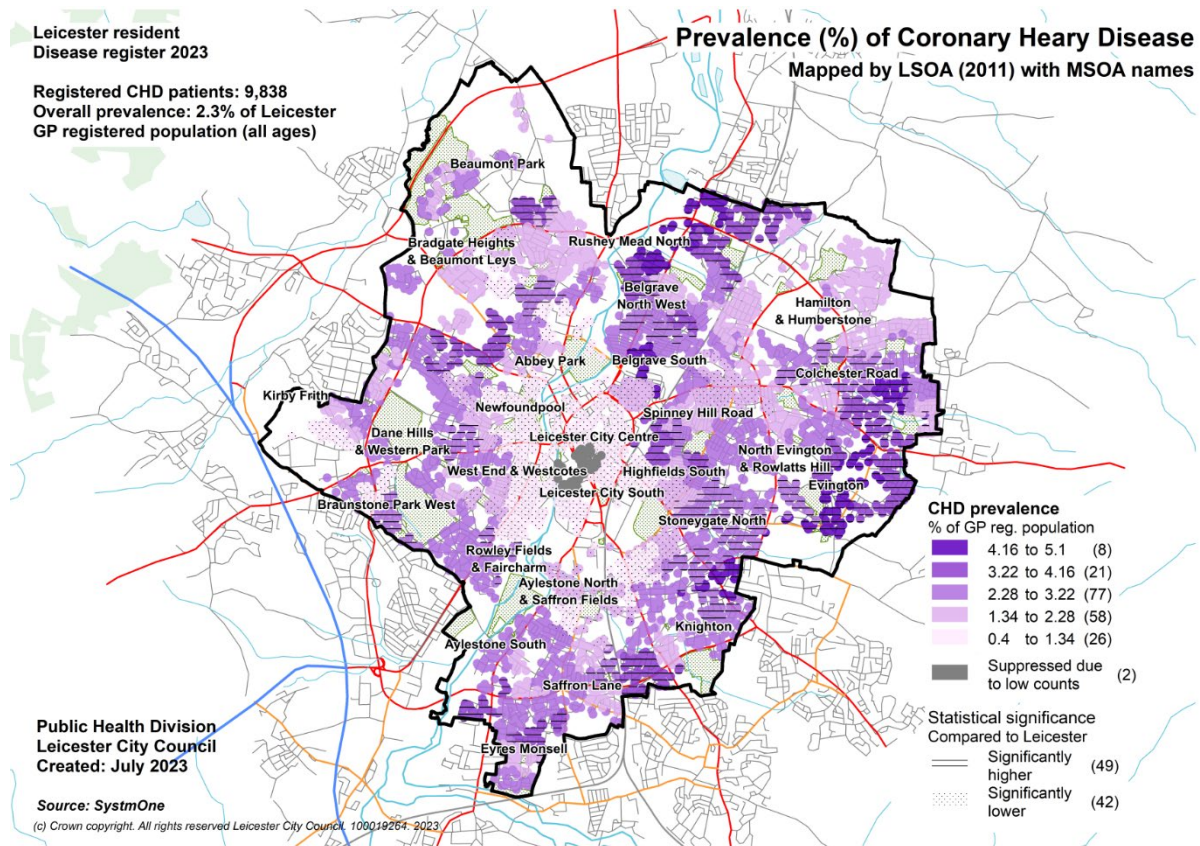
Figure 13: CHD Prevalence in Leicester by age and sex



Data: SystmOne, May 2023

Figure 14 shows the crude prevalence of CHD across Leicester. The map is not age-standardised, so generally reflects the city's age profile with low prevalence of CHD in the city centre, which has a younger demographic profile, and higher prevalence in areas with a greater concentration of older people such as Knighton, Evington, and Rushey Mead.

Figure 14: Crude CHD Prevalence in Leicester by LSOA

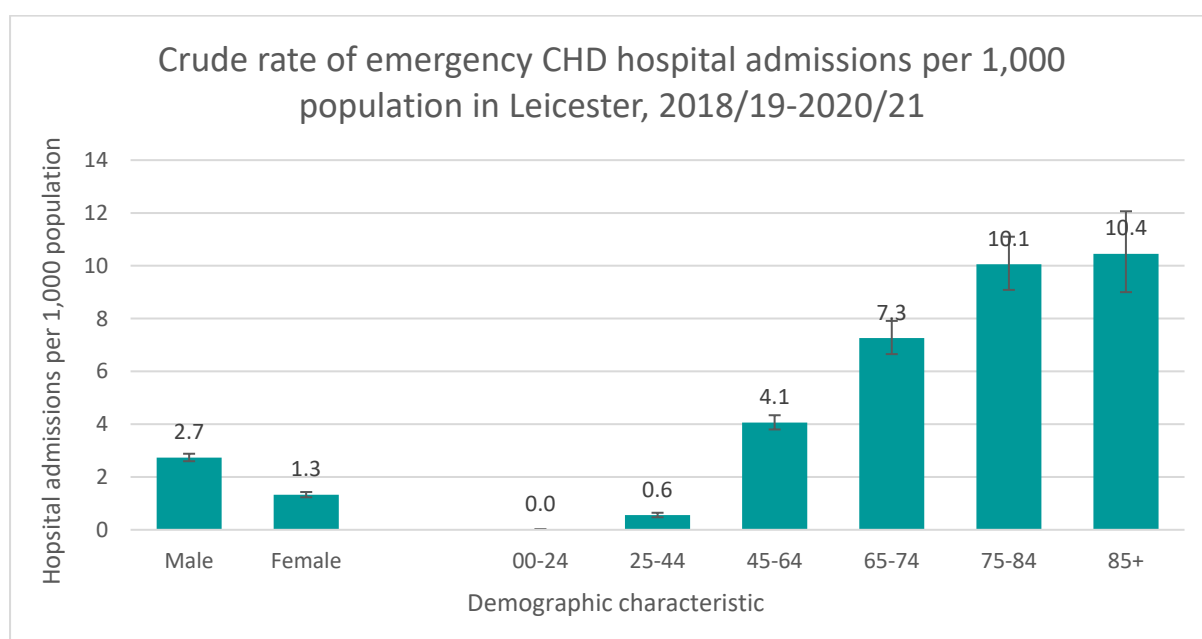


Data: SystmOne, May 2023

3.2.2 CHD HOSPITAL ADMISSIONS

Between 2018/19 and 2020/21 there were over 3,000 Leicester resident hospital admissions due to CHD. ¹⁴ Of these, around 69% of admissions were emergency and the remainder were planned. Higher rates of emergency admissions were found in the over 45s, accounting for over 90% of all emergency CHD admissions. Emergency admission rates for CHD in Leicester are significantly higher in men compared to women.

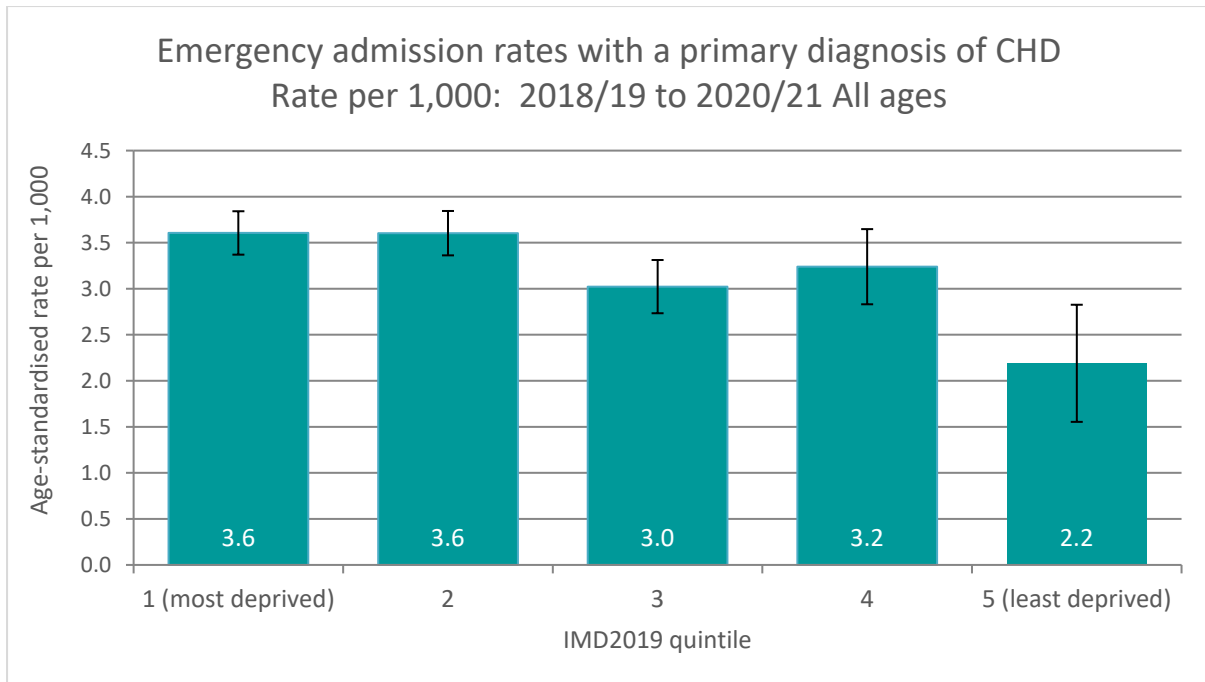
Figure 15: Emergency hospital admission rates for CHD by age and sex in Leicester, 2018/19-2020/21



Data: NHS Digital: Hospital episode Statistics, ONS: mid-year population estimates (2018-2020)

Figure 16, below, shows emergency hospital admission rates for CHD by national deprivation quintile. The rate is significantly higher in Leicester’s most deprived areas, at 3.6 admissions per 1,000 population, compared to Leicester’s least deprived areas (2 per 1,000 population).

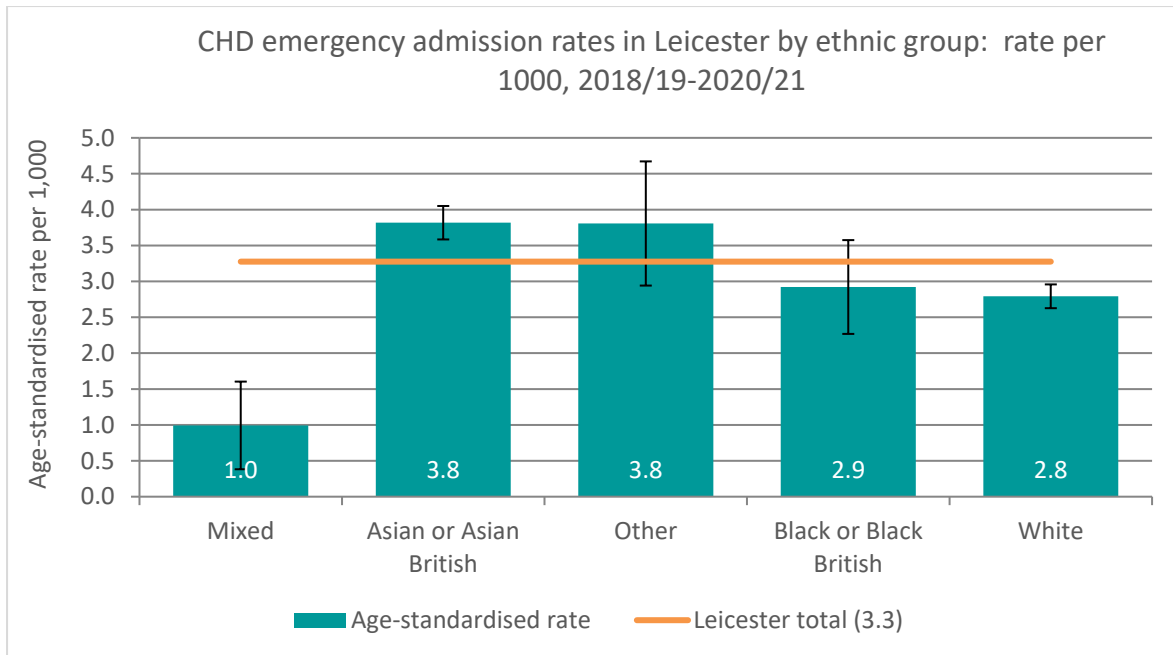
Figure 16: Emergency hospital admission rates for CHD by age and sex in Leicester, 2018/19-2020/21



Data: NHS-Digital: Hospital episode Statistics, ONS: mid-year population estimates (2018-2020)

By ethnicity, emergency admission rates are significantly higher in the Asian population compared to Leicester overall and the White population. CHD admissions are significantly lower in Leicester’s Mixed ethnicity population, although this population is relatively small compared to other groups.

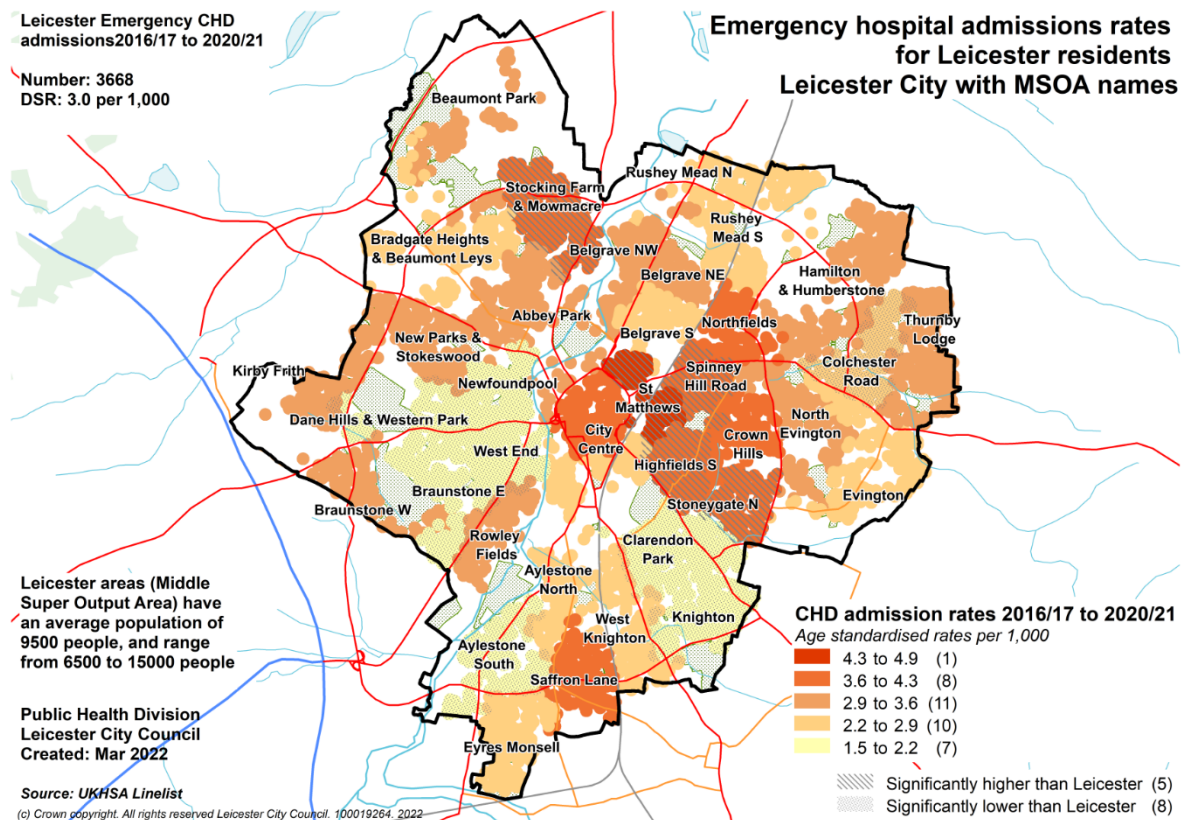
Figure 17: Emergency hospital admission rates with a primary diagnosis of CHD by broad ethnicity Leicester residents



Data: NHS-Digital: Hospital episode Statistics; Census 2021 population

Figure 18 shows that MSOAs in the city centre and east of the city have some of the highest rates of CHD emergency hospital admissions in the city. Stocking Farm & Mowmacre, Spinney Hill Road, Highfields South, Stoneygate North and St Matthews & Highfields North MSOAs had rates which were significantly higher than the Leicester overall. These areas have large Asian populations. Rates in Colchester Road, Newfoundpool, Dane Hills & Western Park, West End & Westcotes, Clarendon Park & Stoneygate South, Braunstone Park East, Knighton and Aylestone South were significantly lower than the Leicester overall.

Figure 18: Emergency hospital admission age-standardised rates for Coronary Heart Disease by MSA in Leicester, 2016/17 to 2020/21

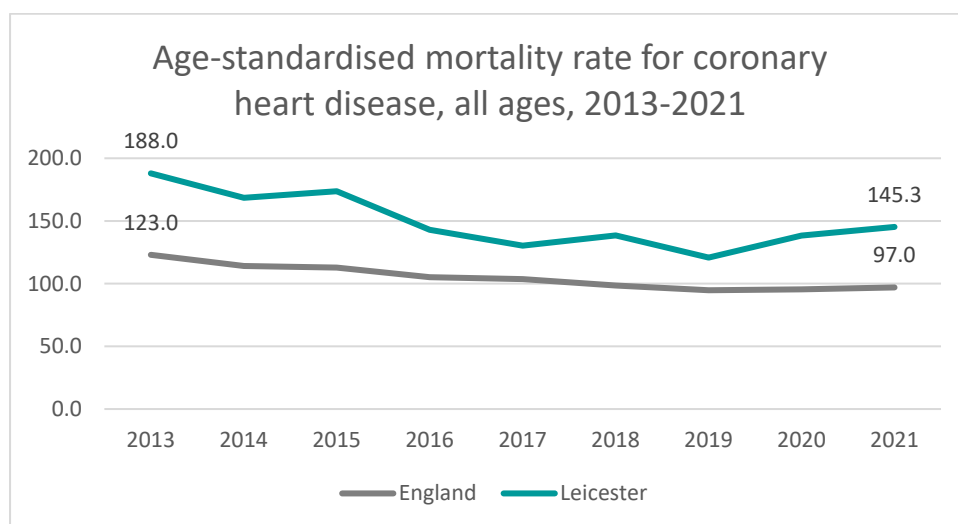


Data: NHS-Digital: Hospital episode Statistics

3.2.3 CHD MORTALITY

In 2021, there were 335 deaths in Leicester from CHD with 152 of these in under 75-year-olds (107 males and 43 females).¹⁵ The age-standardised CHD mortality rate is statistically significantly higher in Leicester (145.3) than England (97).¹⁶ In both areas CHD mortality has declined since 2013, although in Leicester the rate has recently increased from its 2019 low.

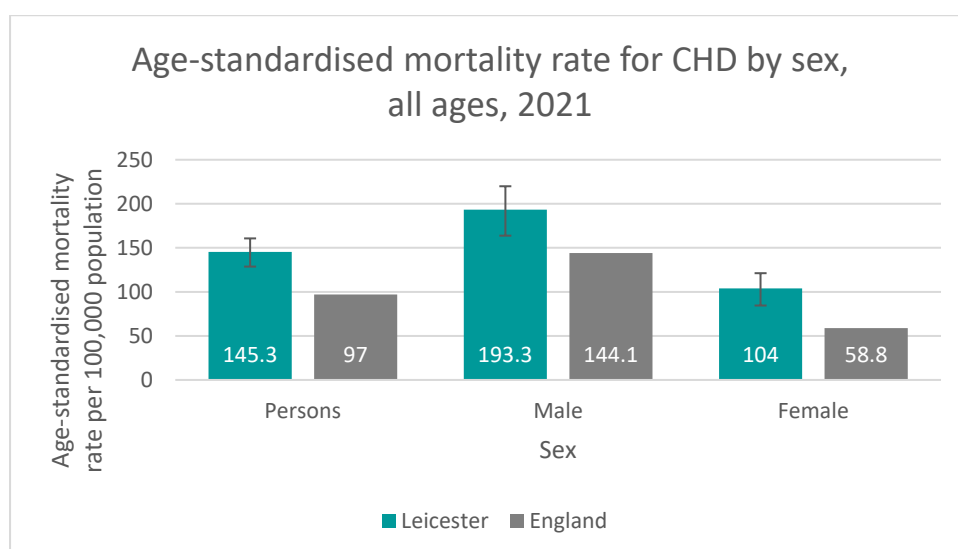
Figure 19: Age-standardised mortality rate from all cardiovascular disease, 2013-2021



Data: ONS, Mortality Statistics: Underlying cause of death: I20-I25, Nomis

CHD mortality is significantly higher in men than women nationally and in Leicester. Leicester's CHD mortality rate is significantly higher than England for both males and females, and a contributor towards the life expectancy gap.

Figure 20: Age-standardised mortality rate from all cardiovascular disease, 2021

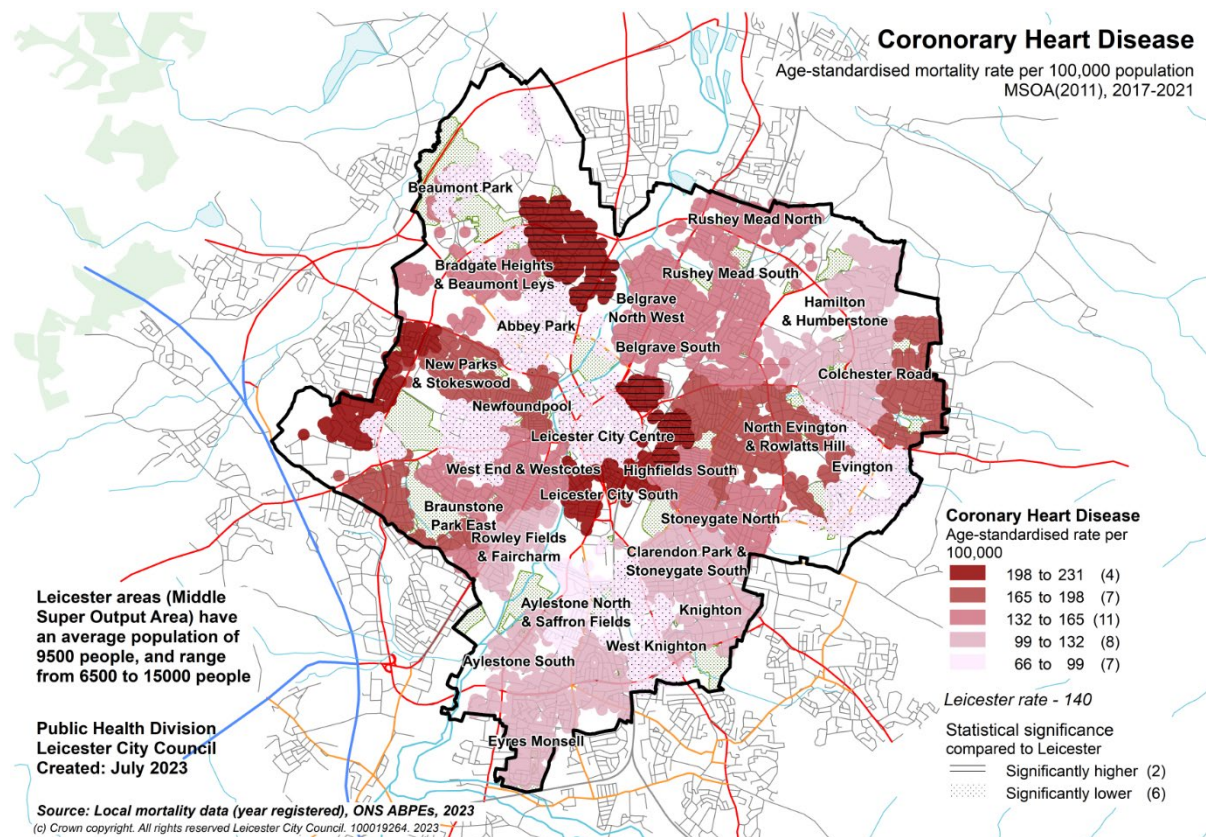


Source: OHID, Fingertips, mortality rate from heart disease 2021

Variation across Leicester

Age-standardised CHD mortality rates by Leicester MSOA are presented in the map below. St Matthews & Highfields North to the east of the city centre, as well as Mowmacre & Stocking Farm in the north of the city have significantly higher rates of CHD mortality. Areas with significantly lower rates of CHD mortality include Dane Hills & Western Park, Beaumont Park, Abbey, the city centre, Evington, and West Knighton.

Figure 21: Coronary heart disease mortality rates in Leicester by MSOA, 2017-21



Source: Local mortality data, ONS admin-based population estimates 2023

3.3 STROKE AND TRANSIENT ISCHAEMIC ATTACKS

Stroke is caused by the interruption of the blood supply to the brain, usually because a blood vessel bursts or is blocked by a clot. This cuts off the supply of oxygen and nutrients, causing damage to the brain tissue.

The most common symptom of a stroke is sudden weakness or numbness of the face, arm or leg, most often on one side of the body. Other symptoms include confusion, difficulty speaking or understanding speech; difficulty seeing with one or both eyes; difficulty walking, dizziness, loss of balance or coordination; severe headache with no known cause; fainting or unconsciousness.

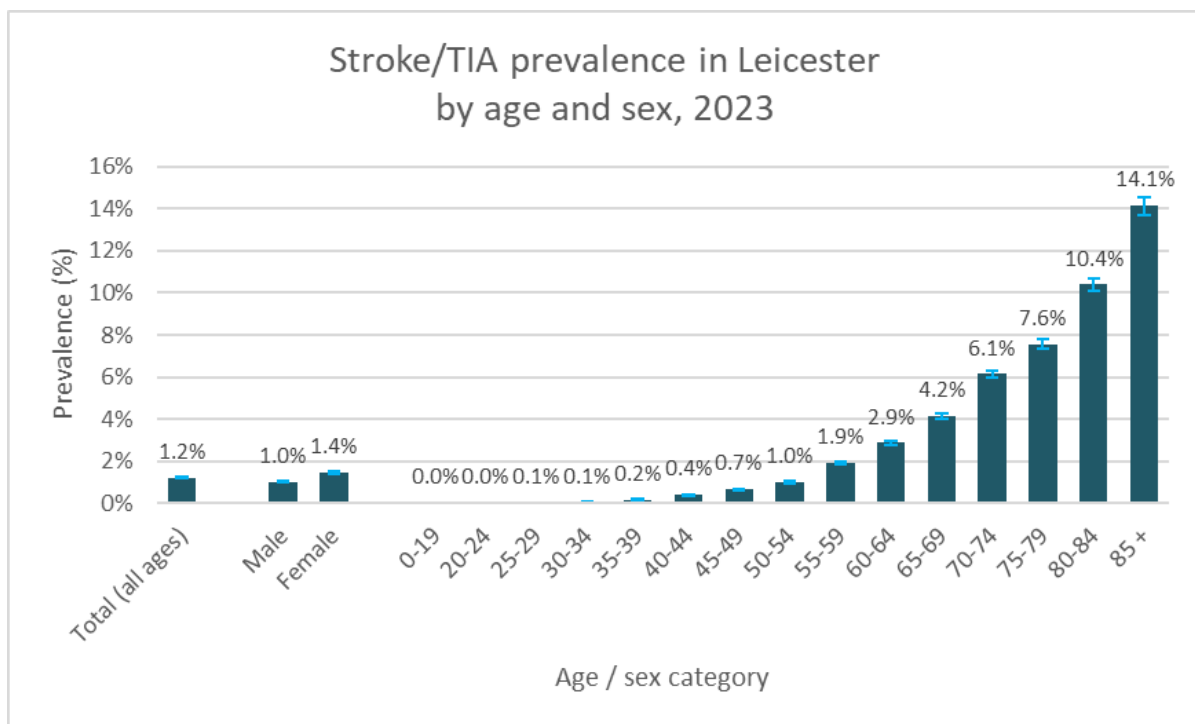
The effects of a stroke depend on which part of the brain is injured and how severely it is affected. A very severe stroke can cause sudden death.

A transient ischaemic attack (TIA) is a related condition, where the blood supply to the brain is temporarily interrupted. This can cause a milder form of stroke which can have many of the symptoms of a stroke and can last a few minutes or persist up to 24 hours.

3.3.1 STROKE AND TIA PREVALENCE

In 2023 there were 5,304 people recorded on GP registers who had experienced a stroke or transient ischaemic attack (TIA), which is equivalent to around 1.2% of the GP-registered population.¹⁷ Figure 22 shows that the prevalence of stroke and TIA in Leicester is significantly higher in females than in males and increases significantly with age.

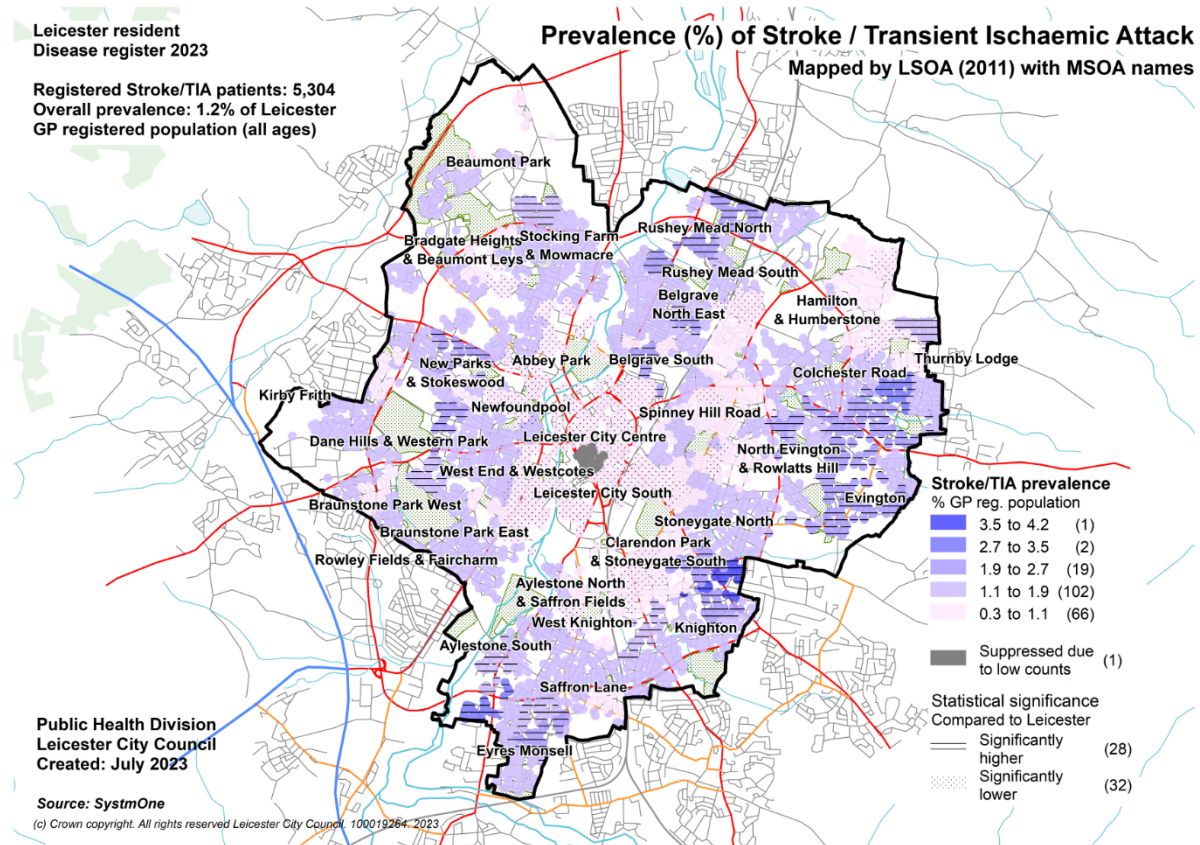
Figure 22: Stroke prevalence in Leicester by age and sex



Data: SystemOne, May 2023

The map below presents the prevalence of Stroke/TIA across Leicester. The map is not age-standardised, so generally reflects the city's age profile with highest prevalence in areas with a greater concentration of older people such as Knighton, Evington, and Rushey Mead. There are also distinct areas of high prevalence areas in the South and West of the city such as New Parks, Aylestone, and Eyres Monsell.

Figure 23: Crude stroke/TIA prevalence in Leicester by LSOA

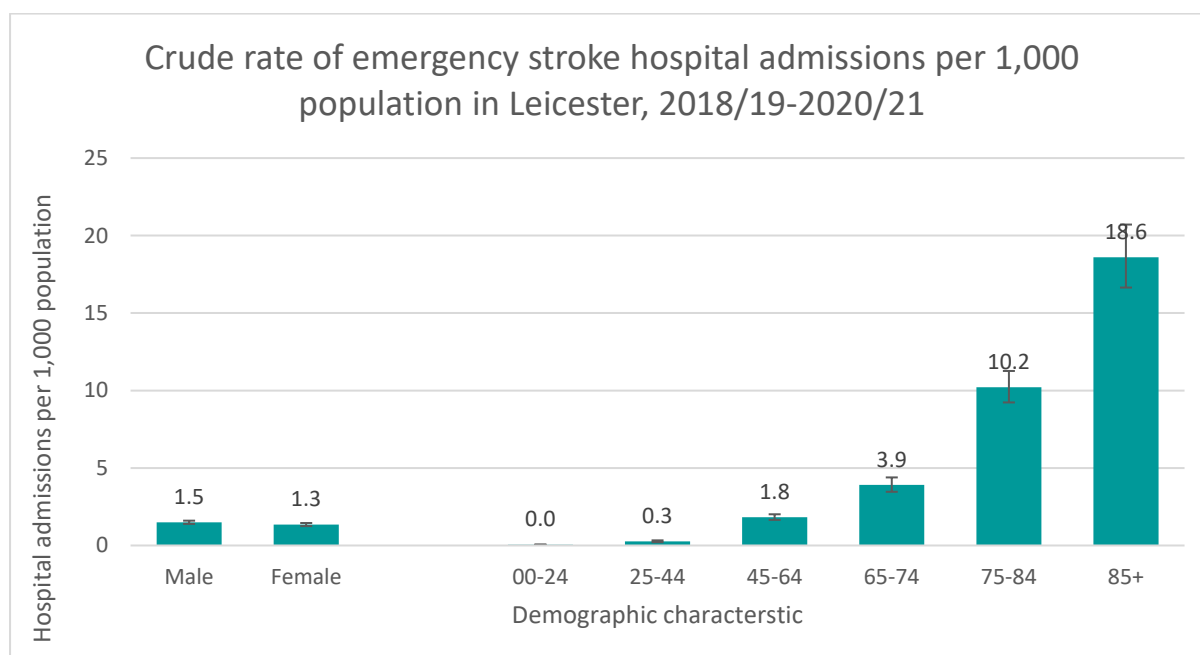


Data: SystmOne, May 2023

3.3.2 STROKE HOSPITAL ADMISSIONS

Between 2018/19 and 2020/21 over 1,500 Leicester residents had hospital admissions due to stroke. Of these, around 90% of admissions were emergency and the remainder were planned. Figure 24 shows the emergency hospital admission rates for stroke in Leicester, equivalent to around 500 emergency hospital stays per year. Similar rates per 1,000 were found in men and women, with significant increases in the rate with each increase in age band.

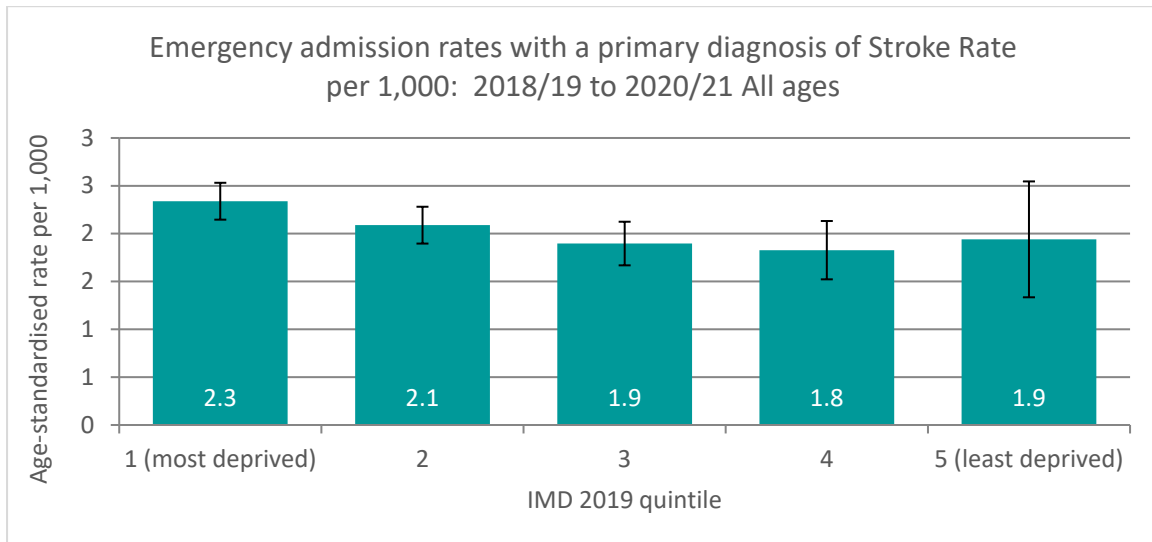
Figure 24: Stroke emergency hospital admission rates per 1,000 population in Leicester by age and sex, 2018/19-2020/21



Data: NHS-Digital: Hospital episode Statistics; ONS: mid-year population estimates (2018, 2019, 2020)

There is no significant difference between the rate of emergency hospital admissions for stroke when comparing the most and least deprived areas in Leicester.

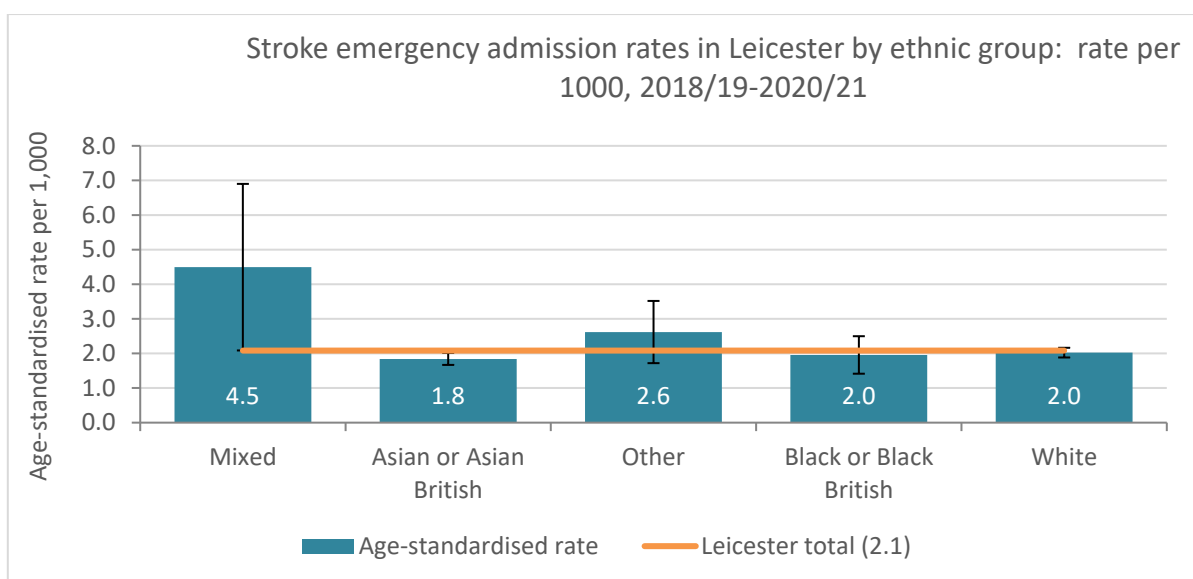
Figure 25: Emergency hospital admission rates with a primary diagnosis of stroke per 1,000 population in Leicester by deprivation quintile



Data: NHS-Digital: Hospital episode Statistics; Index of Multiple Deprivation 2019

There are no statistically significant differences between broad ethnic groups in Leicester for emergency hospital admissions for stroke. While not statistically significant, the rate of admission is twice as high in the Mixed population compared to Leicester overall. This is in contrast to CHD, for which the Mixed population had the lowest rates of admission.

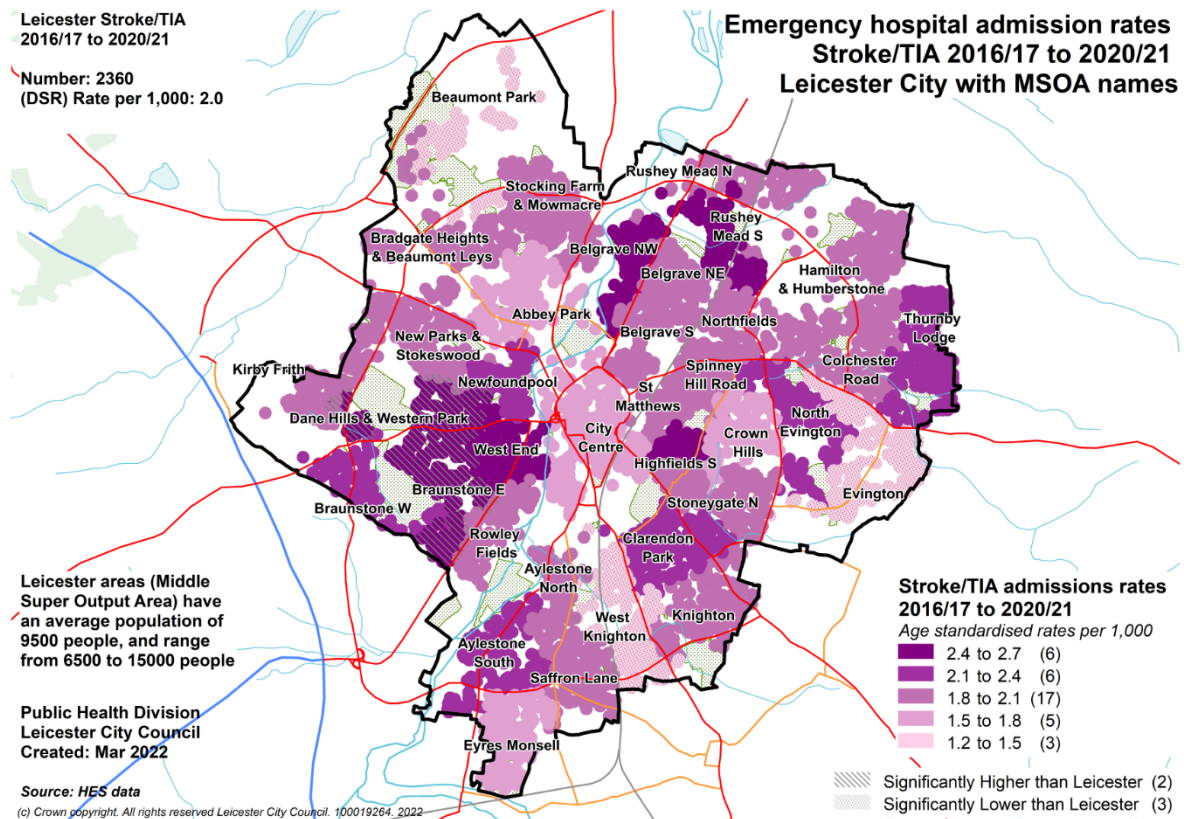
Figure 26: Emergency hospital admission rates with a primary diagnosis of stroke per 1,000 population in Leicester by broad ethnicity



Data: NHS-Digital: Hospital episode Statistics; Census 2021 population

The map below shows that MSOAs in the West of the city have some of the highest rates of stroke/TIA emergency hospital admissions in the city. Dane Hills & Western Park and Braunstone Park East MSOAs had rates which were significantly higher than Leicester overall. Evington, Beaumont Park and West Knighton had hospital admission rates for stroke/TIA which were significantly lower than Leicester overall.

Figure 27: Emergency hospital admission age-standardised rates for Stroke/TIA by MSOA in Leicester, 2016/17 to 2020/21

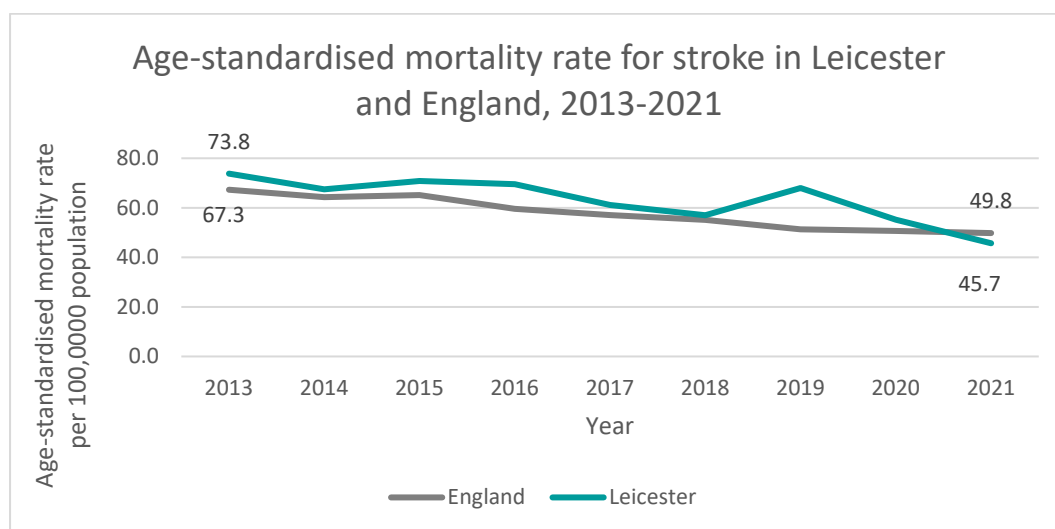


Data: NHS-Digital: Hospital episode Statistics; ONS population estimates

3.3.3 STROKE MORTALITY

In 2021 there were 105 deaths with the underlying cause of stroke in Leicester.¹⁸ Leicester’s age-standardised stroke mortality rate (49.8) is similar to England (45.7). In both areas stroke mortality has declined since 2013.

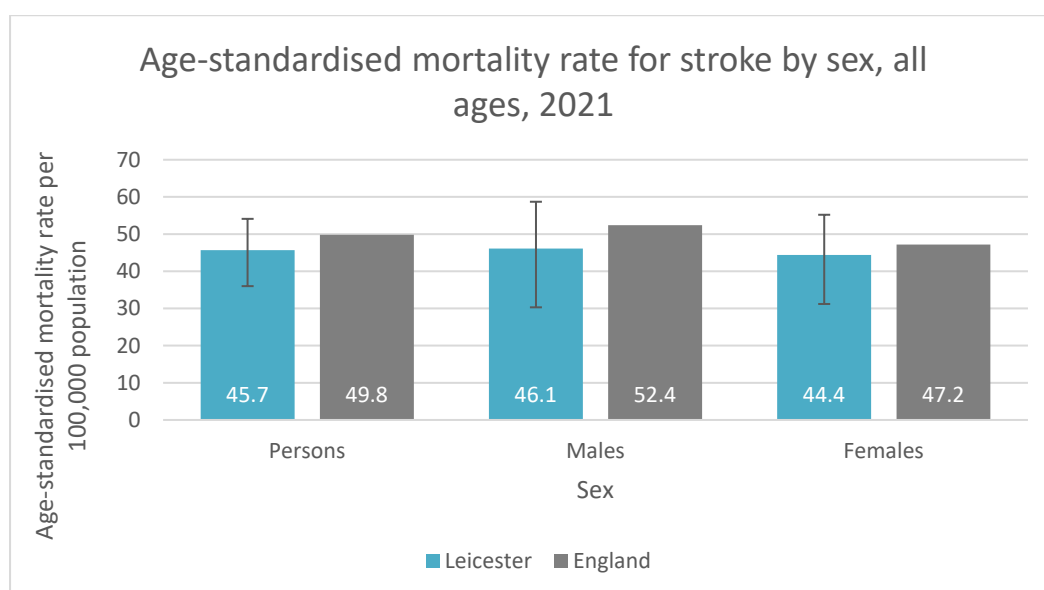
Figure 28: Age-standardised stroke mortality rate per 100,000 population in Leicester and England (2013-2021)



Data: ONS Mortality Statistics: Underlying cause of death: I60-I69, Nomis

Figure 29 presents stroke mortality rates by sex for Leicester and England for 2021. Unlike other cardiovascular diseases, stroke mortality rates are similar for Leicester and England, and for Leicester males and females.

Figure 29: Age-standardised mortality rate from stroke, 2021



Source: OHID: Fingertips; Mortality rate from stroke, 2021

3.4 HEART FAILURE

Heart failure means that the heart is unable to pump blood around the body properly. It is a long-term condition that usually occurs because the heart has become too weak or stiff and tends to get gradually worse over time. Heart failure is often the result of several problems affecting the heart, including coronary heart disease, hypertension, and atrial fibrillation.

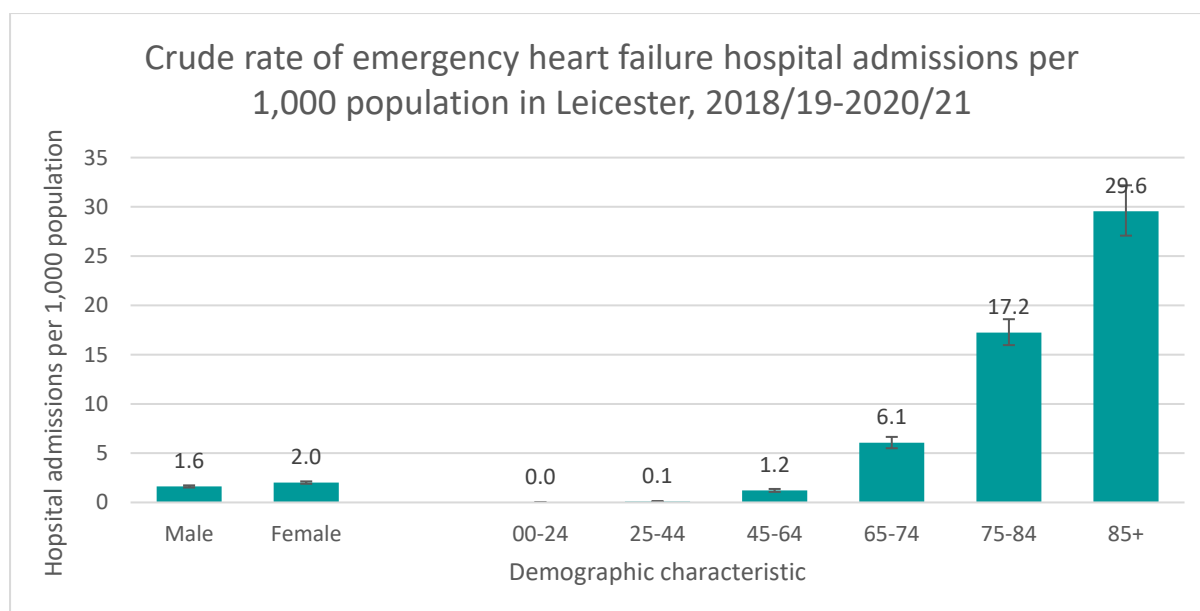
3.4.1 HEART FAILURE PREVALENCE

In Leicester, there are more than 3,500 people recorded on GP registers diagnosed with heart failure, equivalent to 0.8% of the total population. This is significantly below the England prevalence of 0.9%.¹⁹

3.4.2 HEART FAILURE HOSPITAL ADMISSIONS

Between 2018/19 and 2020/21 there were over 2,000 Leicester resident hospital admissions due to heart failure. Of these, around 95% of admissions were emergency and the remainder were planned. Figure 30 shows the emergency hospital admission rates for heart failure in Leicester, equivalent to around 650 emergency hospital stays per year. Rates per 1,000 were found to be significantly higher in women than in men, with significant increases in the rate with each increase in age band.

Figure 30: Heart failure emergency hospital admission rates per 1,000 population in Leicester by age and sex, 2018/19-2020/21

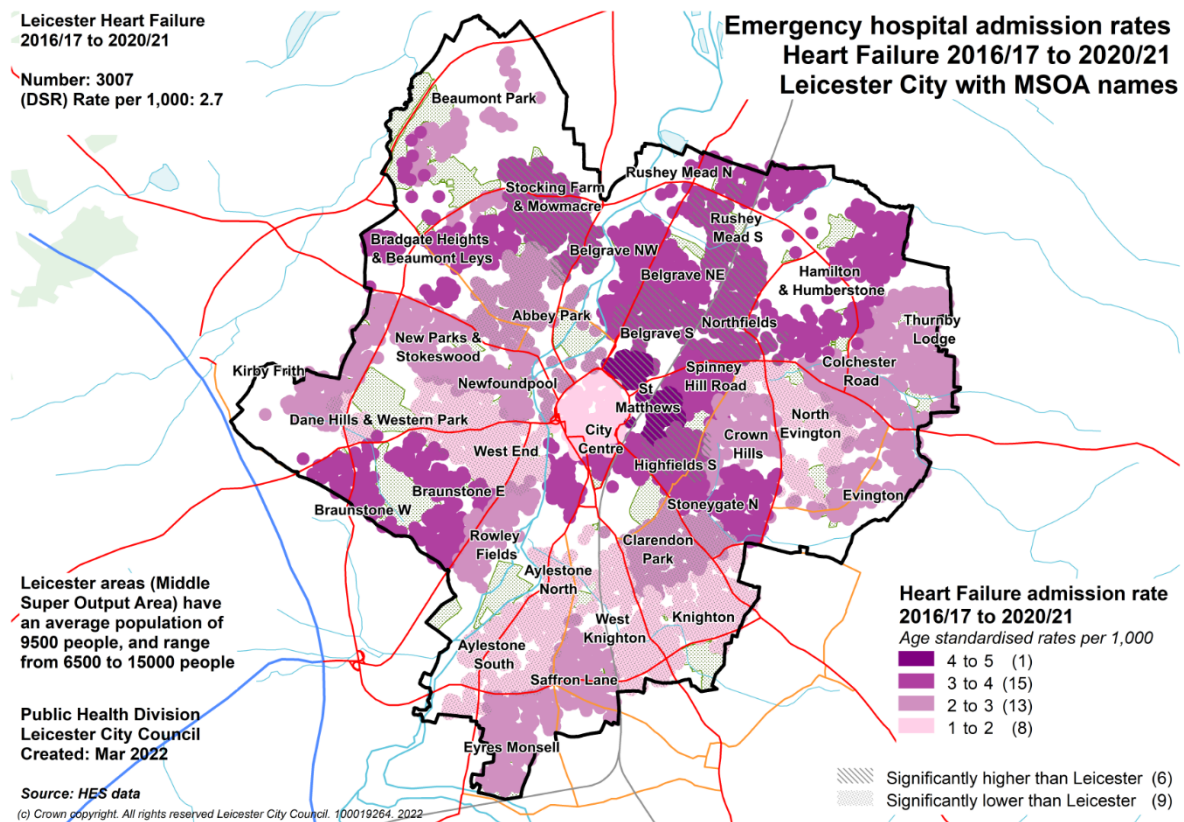


Data: NHS-Digital: Hospital episode Statistics; ONS: mid-year population estimates (2018, 2019, 2020)

Figure 31 shows that MSOAs in the Northeast of the city have some of the highest rates of heart failure emergency hospital admissions in the city. Stocking Farm & Mowmacre, Rushey

Mead South, Belgrave south, Northfields & Merrydale, St Matthews & Highfields North and Highfields south MSOAs had rates which were significantly higher than the Leicester average for the period from 2016/17 to 2020/21. Abbey Park, North Evington & Rowlatts Hill, Dane Hills & Western Park, West End & Westcotes, Clarendon Park & Stoneygate South, Aylestone North & Saffron Fields, Knighton, Aylestone South and West Knighton were areas where the hospital admission rates for heart failure were significantly lower than the Leicester overall.

Figure 31: Emergency hospital admission age-standardised rates for heart failure by MSOA in Leicester, 2016/17 to 2020/21

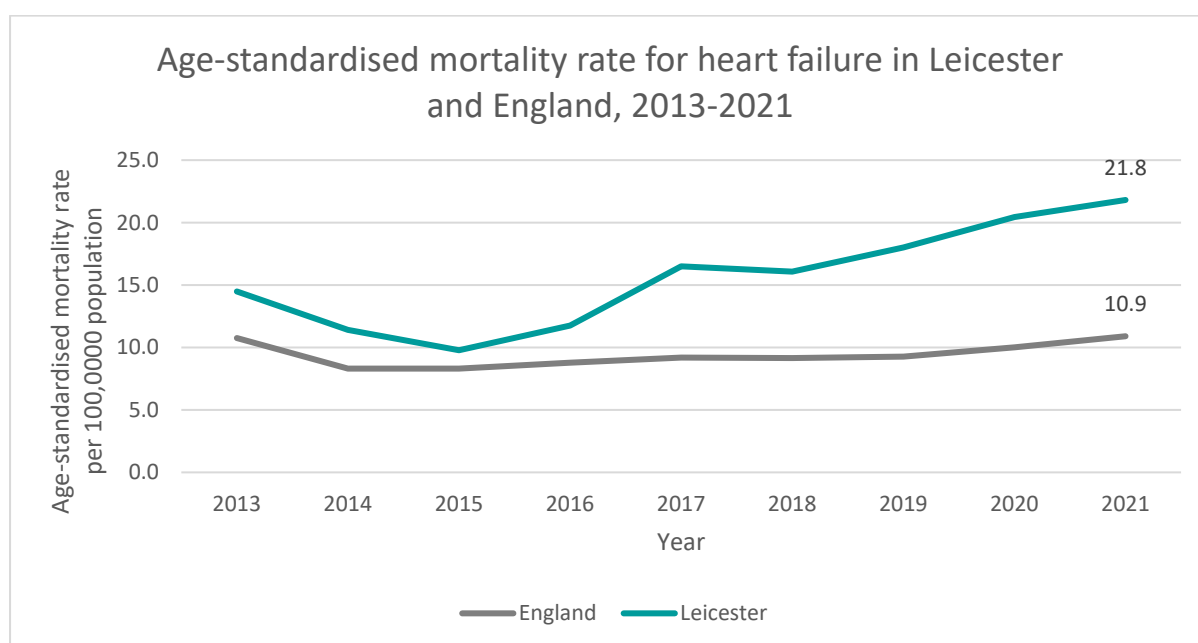


Data: NHS-Digital: Hospital episode Statistics, ONS: mid-year population estimates

3.4.3 HEART FAILURE MORTALITY

In 2021 there were 47 Leicester resident deaths with heart failure indicated as the underlying cause.²⁰ The age-standardised mortality rate per 100,000 population for deaths from heart failure in Leicester has shown an increasing trend since 2015 when the rate was 9.8 per 100,000 population. Over this period the gap with England has widened and the heart failure mortality rate is now double the national rate.

Figure 32: Heart failure mortality rate per 100,000 population in Leicester and England (2013-2021)



Data: ONS Mortality Statistics: Underlying cause of death: I50 Heart failure, Nomis

3.5 HYPERTENSION

Hypertension is the medical term for high blood pressure. Persistent high blood pressure puts extra strain on blood vessels. Over time this makes it easier for arteries to become blocked by atheroma (fatty deposits), reducing or even preventing the flow of blood to the heart and other organs.²¹

Hypertension is the leading risk factor for CVD mortality and morbidity in England. It increases the risk of:

- heart disease
- heart attacks
- strokes
- heart failure
- peripheral arterial disease
- aortic aneurysms

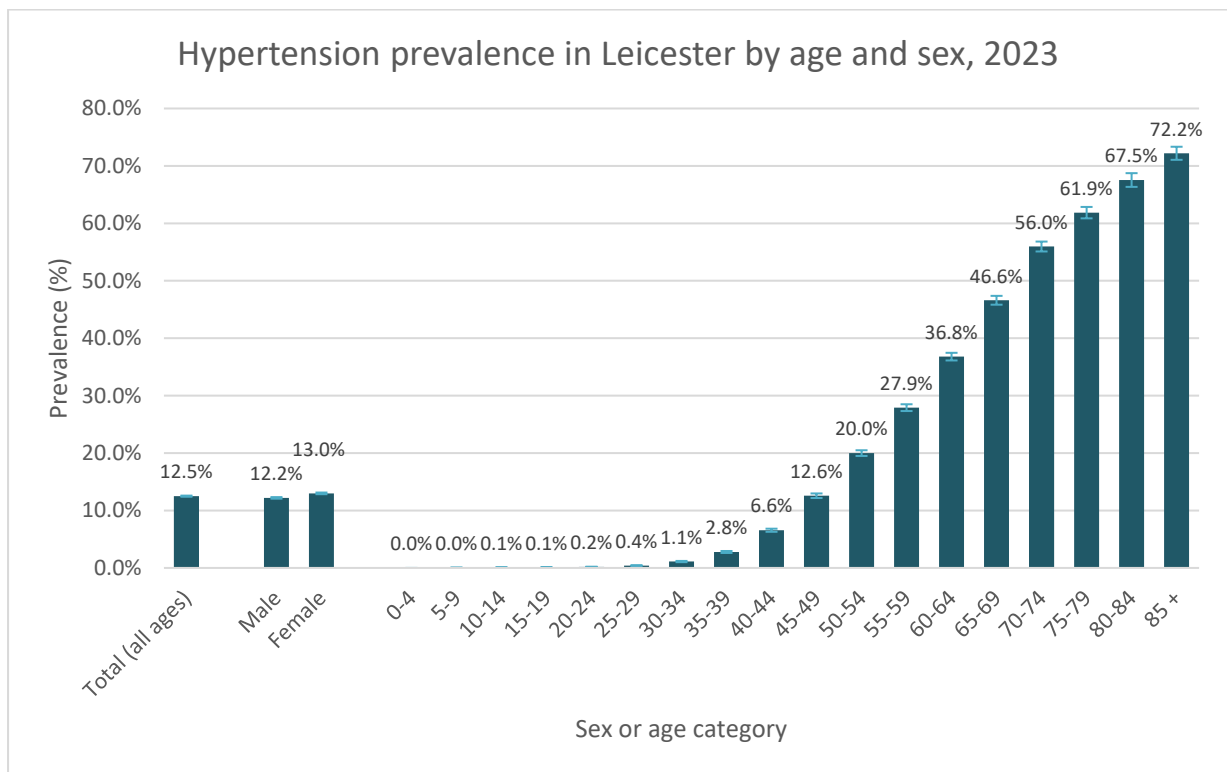
- kidney disease
- vascular dementia

Early diagnosis and treatment of hypertension is an important secondary prevention measure for other conditions, such as stroke, and efforts should be made to identify and manage as many unknown cases as possible.

3.5.1 HYPERTENSION PREVALENCE

In Leicester, there are more than 50,000 people recorded on GP registers with diagnosed hypertension, just over 12% of the total population.²² The prevalence is similar in males and females, and highest in age groups over 45 years with significant increases in prevalence with each increase in age band.

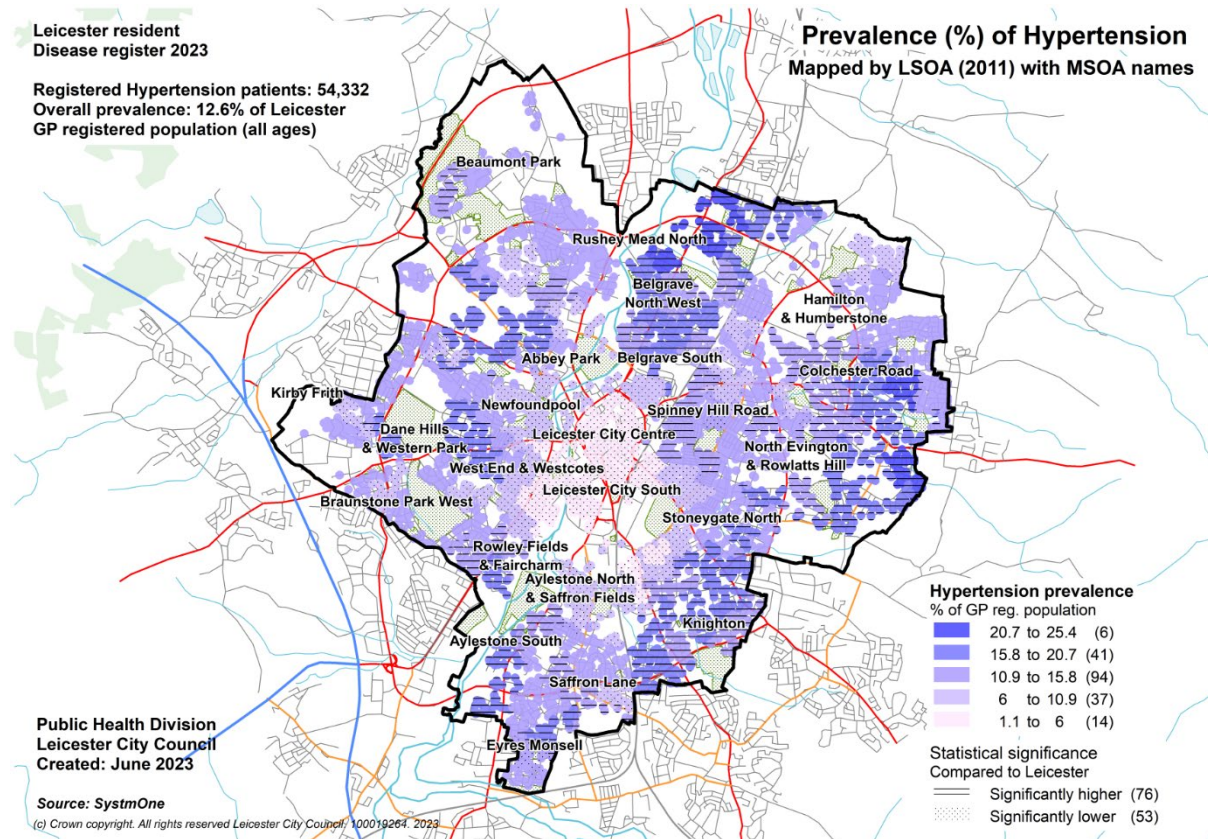
Figure 33: Hypertension prevalence in Leicester by age and sex



Data: SystmOne, May 2023

The map below shows the crude prevalence of hypertension across Leicester. The map is not age-standardised, so generally reflects the city’s age profile with low prevalence of hypertension in the city centre, which has a younger demographic profile, and highest prevalence in areas with a greater concentration of older people such as Knighton, Evington, and Rushey Mead.

Figure 34: Crude hypertension prevalence in Leicester by LSOA



Data: SystmOne, May 2023

3.5.1.1 UNDIAGNOSED HYPERTENSION ESTIMATES

ONS analysis of Health Survey for England data found there is likely to be significant numbers of adults with undetected hypertension in England.²³ The ONS found that of those adults with high blood pressure, around three in then had not been diagnosed with hypertension. This is equivalent to around 9% of the total English adult population.

ONS estimates of undiagnosed hypertension are applied to Leicester’s population in the table below. This suggests there could be almost 24,000 undiagnosed cases of hypertension in the city. Undiagnosed prevalence is estimated to be higher in those over 35 years of age, with the highest in women aged 65-74 (15.5%). The highest estimated number of undiagnosed cases is in men aged 55-64 (2,990). However, there are still large numbers of residents estimated to have undiagnosed hypertension in younger age groups, particularly younger males.

This diagnosis gap underlines the importance of blood pressure checks as both part of routine healthcare for younger people and of the NHS Health Checks programme for older people.

Figure 35: Crude estimates of undiagnosed hypertension in Leicester’s population by age and sex

Age band	Female		Male		Person
	est. % with undiagnosed hypertension	est. number with undiagnosed hypertension	est. % with undiagnosed hypertension	est. number with undiagnosed hypertension	est. number with undiagnosed hypertension
16-24 years	1.1%	318	4.6%	1,338	1,656
25-34 years	3.5%	970	7.0%	1,881	2,851
35-44 years	4.6%	1,220	9.7%	2,487	3,707
45-54 years	8.0%	1,793	12.1%	2,683	4,476
55-64 years	11.6%	2,320	15.1%	2,990	5,310
65-74 years	15.5%	1,767	14.6%	1,595	3,362
75 years and over	15.0%	1,598	11.0%	834	2,431
Total	6.7%	9,986	10%	13,807	23,793

Data: Health Survey for England/ONS, Risk factors for undiagnosed high blood pressure in England: 2015 to 2019 dataset; Census 2021

3.5.2 HYPERTENSION MORTALITY

The main impact of hypertension is its association with a higher risk of other conditions. However, hypertension is indicated as the underlying cause of small number of deaths in Leicester each year.

Between 2017 and 2021 there were 166 deaths in Leicester with hypertensive diseases and secondary hypertension indicated as the underlying cause, of which 98 were female and 68 were male.²⁴

3.6 ATRIAL FIBRILLATION

Atrial fibrillation is a heart condition that causes an irregular and often abnormally fast heart rate. Usual symptoms include noticeable heart palpitations often for a few seconds or, in some cases, a few minutes. Periods of abnormal heart rate may be triggered by certain situations, such as drinking too much alcohol or smoking. This can cause problems including dizziness, shortness of breath and tiredness. Atrial fibrillation increases the risk of having a stroke by five times. In extreme cases, atrial fibrillation can also lead to heart failure.

Atrial flutter is less common than atrial fibrillation, but shares the same symptoms, causes and possible complications.

3.6.1 ATRIAL FIBRILLATION PREVALENCE

In 2021/22, around 4,500 (1.1%) people registered with a Leicester GP practice had atrial fibrillation which is significantly below the England prevalence of 2.1%.²⁵

Leicester's recorded prevalence is significantly lower than 2019 prevalence estimates by Public Health England (1.7%).²⁶ Leicester has one of the lowest detection rates in England: in 2018/19 only 65% of those with the condition had been detected and were on the appropriate register compared to 80% for England overall.²⁷ This equates to around 2,100 Leicester residents who have atrial fibrillation and its associated risks but have not been detected and therefore cannot manage their condition.²⁸

3.6.2 ATRIAL FIBRILLATION MORTALITY

The main impact of atrial fibrillation is its association with a higher risk of other conditions. However, it is recorded as the underlying cause of a small number of deaths each year.

Between 2017 and 2021 there were 162 deaths in Leicester with atrial fibrillation and flutter indicated as the underlying cause, of which 98 were female and 68 were male.²⁹

3.7 HIGH CHOLESTEROL

High cholesterol is characterised by the build-up of fatty deposits in arteries, making it harder for blood to flow through. High cholesterol is an important risk factor for other cardiovascular conditions, including heart failure and stroke.³⁰ Local estimates of raised cholesterol are not produced, however the Health Survey for England 2021 found 56% of English adults (16+) had raised cholesterol with prevalence highest in those aged 45 to 64 at 72%.³¹

4 CURRENT SERVICES IN RELATION TO NEED

4.1 PREVENTION

There are two main ways of reducing the risk factors associated with CVD:

1. Better management of risk factors such as weight, diet, smoking and exercise, and
2. Identifying people at risk early.

Leicester City Council's [Live Well Leicester](#) lifestyle hub provides a range of services intended to help individuals maintain a healthy weight, increase physical activity, reduce alcohol consumption, and stop smoking.

Further information on the services which aim to reduce the prevalence of CVD risk factors can be found using Leicester's JSNA directory - [Adults' Joint Strategic Needs Assessments \(leicester.gov.uk\)](#)

4.1.1 NHS HEALTH CHECKS

Leicester City Council commissions the NHS Health Checks programme, which aims to aims to prevent cardiovascular disease, and associated conditions, through the early assessment, awareness and management of individual behavioural and physiological risk factors.³² This programme invites all 40–74-year-olds without a current diagnosis of CVD or diabetes to be screened. For the period 2018/19- 2022/23, 50% of Leicester's eligible population had received an NHS Health Check.³³ This is better than England overall (27%). After several years in which the percentage of Leicester's eligible population who had received a health check declined, the most recent period shows an increase compared to 2017/18-2021/22, when 43% had received a health check.

4.2 MANAGEMENT

4.2.1 INTEGRATED CARDIOVASCULAR SERVICE

The aim of the service, commissioned by the ICB, is to reduce the rate of premature mortality from cardiovascular disease, through developing capability within primary care to “proactively case find”, detecting, diagnosing and treating adult patients who are at higher risk of atrial fibrillation (AF) and heart failure (HF). Its components include:

- Detection, diagnosis and optimised management of AF and HF
- Level 4 anticoagulation service: initiation of warfarin therapy for AF patients and on-going monitoring of warfarin therapy for AF, deep vein thrombosis and pulmonary embolism patients; Near Patient Testing (NPT) and Computerised Decision Support.

The key objectives are defined as:

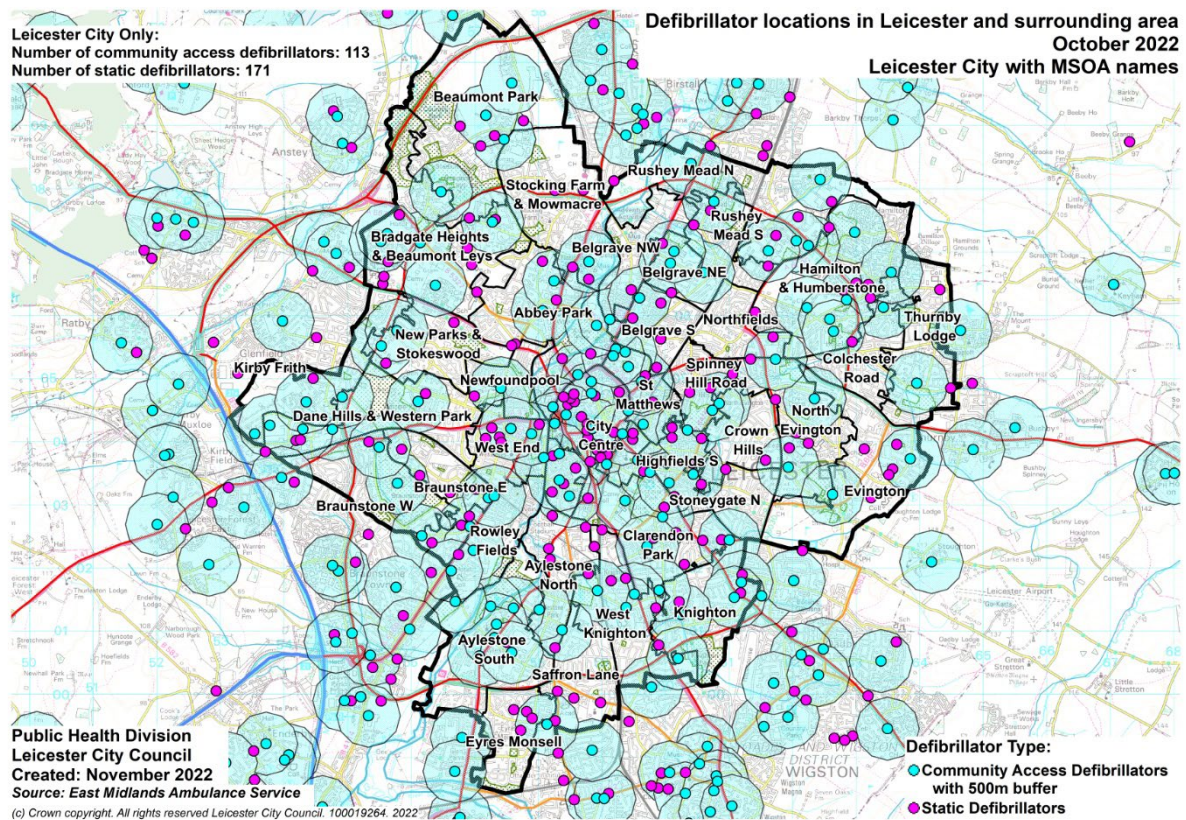
- Developing capability and sustainability within the primary care teams to improve the quality of care and deliver improved clinical outcomes for patients.
- Prompt risk assessment and risk reduction with warfarin for stroke patients and strict adherence to current guidance on AF-related stroke.
- Concordance with National Patient Safety Alert (NPSA18) to ensure safer anticoagulant therapy through managing the risks associated with the prescribing, dispensing and administering of anticoagulants. Anticoagulants are a class of medicines most frequently identified as causing preventable harm and admission to hospital.
- Optimisation of therapeutic interventions for HF patients, particularly within primary care.
- Validation of the practice AF and HF registers.

4.2.2 DEFIBRILLATORS AND THE HEARTSHIELD PROJECT

When a person has a sudden cardiac arrest, the normal rhythm of their heart becomes disrupted and disorganised, which means their heart can't beat properly and they won't be able to breathe normally.³⁴ A defibrillator gives a jolt of energy to the heart, which can help restore the heart's rhythm and get it to beat normally again. Doing Cardiopulmonary resuscitation (CPR) and using a defibrillator on a person who has suffered a cardiac arrest significantly increases their chance of survival. Leicester City Council, the East Midlands Ambulance Service (EMAS), and the Joe Humphries Memorial Trust work in partnership to improve access to, and confidence using, defibrillators in Leicester as part of the Heartshield project.

The map below forms part of a gap analysis undertaken to identify areas of Leicester without access to community access defibrillators (CADs). The pink dots represent static defibrillators, which may be held privately by businesses or other organisations and are often inaccessible to the public. If some of these can be converted to CADs alongside the placement of new defibrillators, defibrillator coverage will be greatly increased. Alongside the expansion of defibrillator coverage, EMAS is working with Leicester's Community Wellbeing Champions Network to develop a programme of community education to improve residents' confidence in using defibrillators.

Figure 36: Map of defibrillator locations in Leicester and surrounding area



Source: East Midlands Ambulance Service. Note: This map is for analysis purposes only and should not be seen as a definitive and up to date list of available CADs. An interactive map is also available here: [Aurora \(leicester.gov.uk\)](http://Aurora.leicester.gov.uk)

5 PROJECTED PREVALENCE IN 3-5 YEARS AND 5-10 YEARS

Based on the ONS 2018 population projections, if the current prevalence and detection of cardiovascular conditions stays the same, Leicester’s growing population will increase the number of cases of each condition on Leicester GP registers over the next decade. By 2032 there will be an additional 3500 people with detected high blood pressure and 300 with atrial fibrillation. GP registers will also have a further 680 CHD, 350 stroke, and 240 heart failure patients.

Figure 37: Crude projections for cardiovascular diseases

Long-term condition	Prevalence (all ages) 2020/21	Count 2020/21	Projected 2027	Projected 2032
Hypertension	12.2%	51,333	53,636	54,827
Coronary Heart Disease	2.4%	10,010	10,459	10,691
Stroke or TIA	1.2%	5,114	5,343	5,462
Atrial fibrillation	1.1%	4,510	4,712	4,817
Heart Failure	0.8%	3,531	3,689	3,771

Data: Quality Outcomes Framework (QOF) prevalence 2020/21, ONS Mid-2018 population projections

6 UNMET NEEDS AND SERVICE GAPS

6.1 DIAGNOSIS GAPS

There are significant gaps between estimated prevalence and rate of recorded diagnosis for hypertension and atrial fibrillation. Seeking to address this, services need a robust approach to earlier detection, diagnosis and treatment of both established disease and any modifiable risk factors.

6.2 HEALTH INEQUALITIES

There are clear inequalities in CVD health outcomes between different population groups in Leicester. These are most clearly demonstrated by emergency hospital admissions data. People living in the most deprived areas of Leicester are significantly more likely to be admitted for CVD overall and CHD specifically. By ethnicity, admission rates for CHD in the Asian population are significantly higher than for the White population.

There are likely to be differences in prevalence and detection rates between populations of different social and ethnic backgrounds in the city, although the data is not currently available to explore these at the local level.³⁵

6.3 POLICY DRIVERS

6.3.1 LEICESTER, LEICESTERSHIRE AND RUTLAND INTEGRATED CARE BOARD FIVE YEAR PLAN, 2023/24 – 2027/28

The LLR ICB's plan sets out how local health services will work together to improve outcomes and reduce health inequalities in the next few years. The plan emphasises the importance of prevention through risk factor interventions to help people stay healthy and well. The ICB outlines the following interventions directly relevant to cardiovascular disease:³⁶

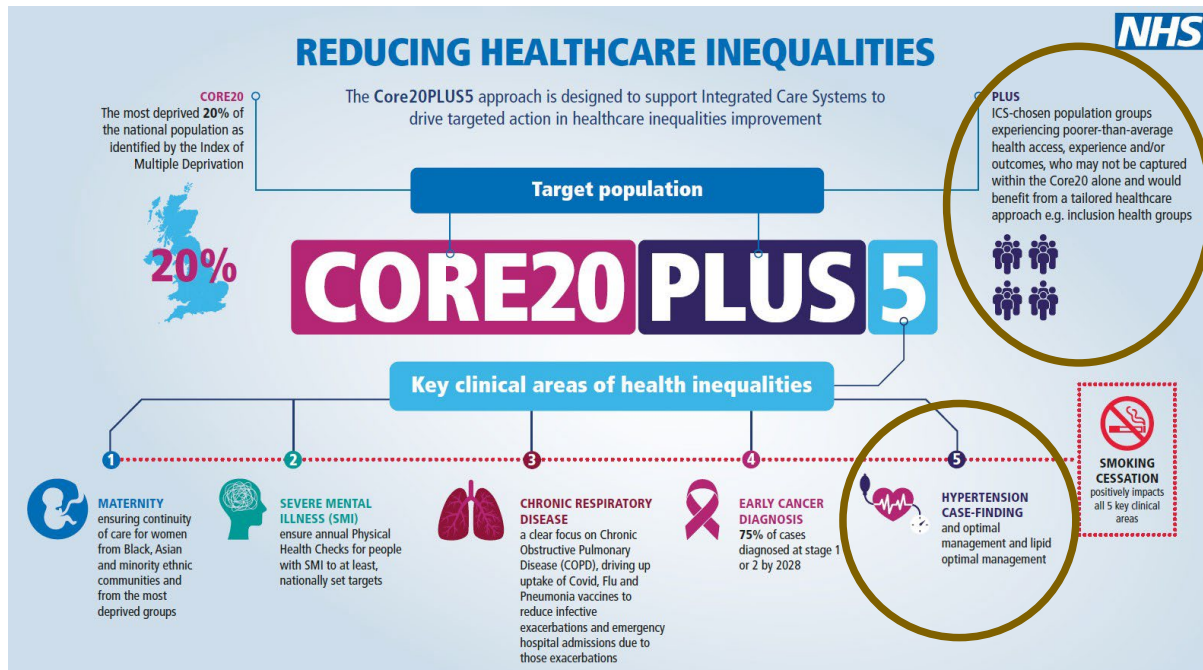
- Expand Healthy Conversation Skills training and embed in all organisations (Making Every Contact Count Plus) as a key prevention enabler.
- Deliver tobacco dependence identification and treatment services in secondary care, including across inpatient, maternity, and mental health services.
- Improve detection and management of risk factors for respiratory and cardiovascular diseases.

6.3.2 CORE 20 PLUS 5

Core 20 Plus 5 is NHS England's national framework for addressing health inequalities. It helps set system priorities by target population and clinical areas. One of the five clinical focus areas is Hypertension case-finding and optimal management and lipid optimal management to allow for interventions to optimise blood pressure and minimise the risk of myocardial infarction and stroke.

In Leicester the 'Plus' populations are people who are homeless; people with severe mental illness; and people with learning disabilities. All these groups are subject to health inequalities which can have an impact on susceptibility to, and management of, cardiovascular conditions. Specifically, those with a severe mental illness have a 53% higher risk of having CVD, and an 85% higher risk of death from CVD compared to the general population.³⁷

Figure 38: CORE 20 PLUS 5 infographic



Source: NHS England, [NHS England » Core20PLUS5 \(adults\) – an approach to reducing healthcare inequalities](#)

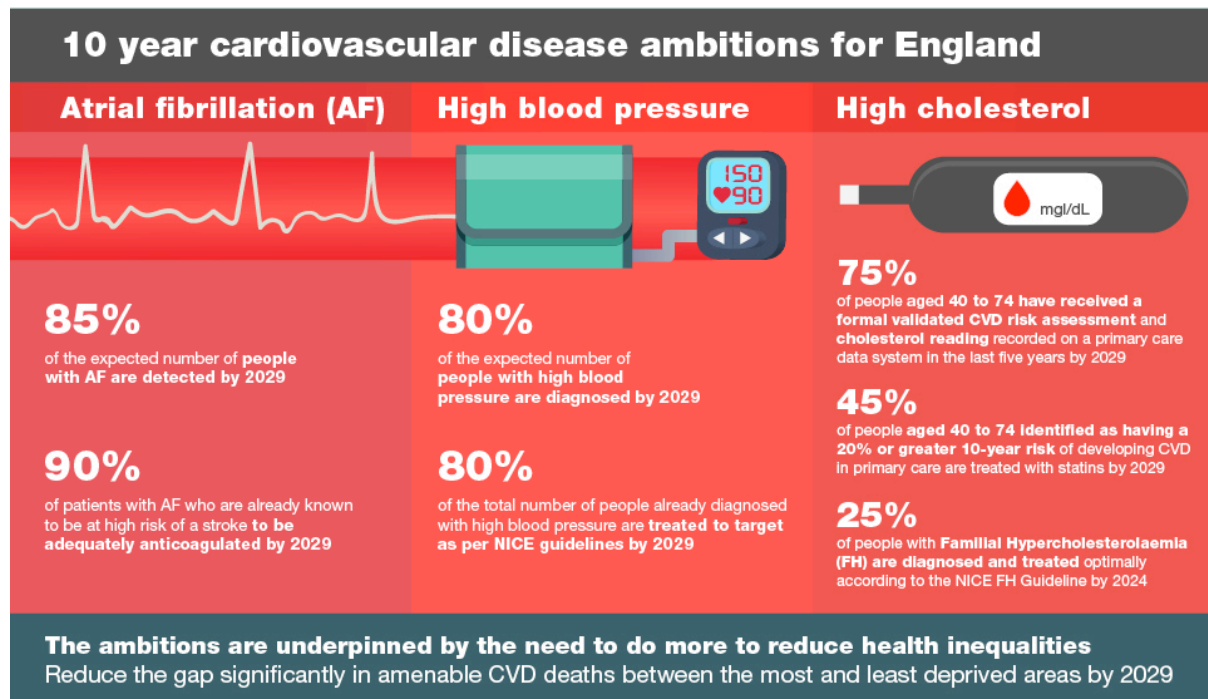
6.3.3 NHS LONG TERM PLAN AND CVDSL F AMBITIONS

The NHS Long-term Plan (NHS LTP) identifies CVD as the single biggest area where the NHS can save lives.³⁸ The plan puts forward an ambition to prevent 150,000 strokes, heart attacks and dementia cases over the next 10 years through earlier detection and management of high-risk conditions.

To complement the NHS LTP, the National CVD Prevention System Leadership Forum (CVDSL F) has agreed specific ambitions, known as ‘the ABC’:

- atrial fibrillation
- blood pressure
- cholesterol

Figure 39: CVDSLIF ambitions for England



Source: Public Health England, Health matters: preventing cardiovascular disease, (2020)

7 RECOMMENDATIONS FOR CONSIDERATION BY COMMISSIONERS

The key recommendations for commissioners include:

- Specific work on hypertension and Atrial Fibrillation case findings through partnerships with PCNs and primary care services.
- Adopting a proportionate universalism approach (i.e. services and resources at a scale and intensity according to need).
- Work towards the ambitions of Leicester’s Care, Health, and Wellbeing Strategy [Leicester's Care, Health and Wellbeing Strategy 2022-2027](#)
- Work to support the delivery of CORE20PLUS5, including focused work with the PLUS groups in Leicester who are: people who are homeless; people with severe mental illness; and people with learning disabilities.
- Develop a shared preventative strategy for all commissioners and providers of clinical care and public health interventions.
- Establish a joint approach to early detection to close the ‘prevalence gap’ and reduce variation in ascertainment and outcome for people at high risk or with an established cardiovascular condition.
- Close the inequality gap through better understanding of need in affected populations and taking appropriate action by care commissioners and providers.
- Continue work to improve the coding of patient characteristics such as ethnicity. This will allow more in-depth analysis of health inequalities.
- Further improvements in CVD care and prevention provided in the community.
- Take the steps outlined by the National CVD Prevention Programme: <https://www.england.nhs.uk/ourwork/clinical-policy/cvd/>

8 KEY CONTACTS:

Matt Curtis, Senior Public Health Intelligence Analyst:

Matthew.curtis@leicester.gov.uk

9 REFERENCES

- ¹ World Health Organisation definition, (2021). Available at: <https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-cvds> [Accessed 27.06.2021]
- ² Global Burden of Disease, DALYs by cause, (2019). Available at: <https://vizhub.healthdata.org/gbd-compare/>
- ³ UK Health Security Agency Blog, Health Matters: Preventing cardiovascular disease. (2019). Available at: [Health Matters: Preventing cardiovascular disease - UK Health Security Agency \(blog.gov.uk\)](https://www.blog.gov.uk/2019/02/16/health-matters-preventing-cardiovascular-disease-uk-health-security-agency) [Accessed 16.02.2022]
- ⁴ NHS, Health A to Z. Available at: <https://www.nhs.uk/conditions/> [Accessed 28.04.2020]
- ⁵ Kidney research UK, Cardiovascular disease. Available at: [Cardiovascular disease - Kidney Research UK](https://www.kidneyresearchuk.org/conditions/cardiovascular-disease/)
- ⁶ Office for Health Improvement & Disparities, Chronic Kidney Disease QOF prevalence (18+), 2021/22, (2022). Public health profiles - OHID ([phe.org.uk](https://www.phe.org.uk))
- ⁷ British Heart Foundation, Diabetes - causes, symptoms & treatments. Available at: [Diabetes - Causes, symptoms & treatments | BHF - BHF](https://www.bhf.org.uk/learn-from-us/our-expertise/diabetes-causes-symptoms-treatments) [Accessed 09.08.2023]
- ⁸ Office for Health Improvement & Disparities, Fingertips, Diabetes QOF prevalence by ICB sub-location, 2021/22, (2022). Available at: [Public health profiles - OHID \(phe.org.uk\)](https://www.phe.org.uk/public-health-profiles/ohid/diabetes-qof-prevalence-by-icb-sub-location)
- ⁹ NICE, CVD risk assessment and management. Available at: [CVD risk assessment and management | Health topics A to Z | CKS | NICE](https://www.nice.org.uk/guidance/NG187) [Accessed 08.08.2023]
- ¹⁰ ONS, Mortality statistics: ICD-10 I00-I99, Nomis (2023).
- ¹¹ Office for Health Improvement & Disparities, Fingertips, Mortality rate from all cardiovascular disease 2021, (2023). Available at: [Mortality Profile - Data - OHID \(phe.org.uk\)](https://www.phe.org.uk/public-health-profiles/ohid/mortality-rate-from-all-cardiovascular-disease-2021)
- ¹² Office for Health Improvement & Disparities, Segment tool, Breakdown of the life expectancy gap between Leicester and England 2020-21, (2023). Available at: [Segment Tool \(phe.gov.uk\)](https://www.phe.gov.uk/segment-tool)
- ¹⁴ University Hospitals of Leicester, *Hospital episode Statistics* (2021)
- ¹⁵ ONS, Mortality statistics: ICD-10 I20-I25, Nomis (2023).
- ¹⁶ Office for Health Improvement & Disparities, Fingertips, Mortality rate from all cardiovascular disease 2021, (2023). Available at: [Mortality Profile - Data - OHID \(phe.org.uk\)](https://www.phe.org.uk/public-health-profiles/ohid/mortality-rate-from-all-cardiovascular-disease-2021)
- ¹⁷ Office for Health Improvement & Disparities, Fingertips, Stroke QOF Prevalence (all ages), 2020/21, (2022). Available at: [Public health profiles - OHID \(phe.org.uk\)](https://www.phe.org.uk/public-health-profiles/ohid/stroke-qof-prevalence)
- ¹⁸ ONS, Mortality statistics: ICD-10 I60-I69, Nomis (2023).
- ¹⁹ Office for Health Improvement & Disparities, Heart Failure QOF prevalence (all ages), 2021/22, (2022). [Public health profiles - OHID \(phe.org.uk\)](https://www.phe.org.uk/public-health-profiles/ohid/heart-failure-qof-prevalence)
- ²⁰ ONS, Mortality statistics: ICD-10 I50, Nomis (2023).
- ²¹ British Heart Foundation (BHF), BHF Website, High blood Pressure. Available at: <https://www.bhf.org.uk/informationsupport/risk-factors/high-blood-pressure> [Accessed 22.04.2020]
- ²² Office for Health Improvement & Disparities, Fingertips, Hypertension: QOF prevalence (all ages), 2022/22, (2022). Available at: [Cardiovascular Disease - OHID \(phe.org.uk\)](https://www.phe.org.uk/public-health-profiles/ohid/hypertension-qof-prevalence)
- ²³ ONS, Risk factors for undiagnosed high blood pressure in England: 2015 to 2019, (2023). Available at: [Risk factors for undiagnosed high blood pressure in England - Office for National Statistics \(ons.gov.uk\)](https://www.ons.gov.uk/peoplepopulationandcommunity/healthandlife/articles/risk-factors-for-undiagnosed-high-blood-pressure-in-england-2015-to-2019)
- ²⁴ ONS, Mortality statistics: I10-I15 Hypertensive diseases, Nomis (2023).
- ²⁵ Office for Health Improvement & Disparities, Fingertips, Atrial fibrillation, QOF prevalence, 2021/22, (2023). Available at: [Public health profiles - OHID \(phe.org.uk\)](https://www.phe.org.uk/public-health-profiles/ohid/atrial-fibrillation-qof-prevalence)
- ²⁶ Office for Health Improvement & Disparities, Fingertips, Estimated prevalence of atrial fibrillation, 2019, (2020). Available at: [Public health profiles - OHID \(phe.org.uk\)](https://www.phe.org.uk/public-health-profiles/ohid/atrial-fibrillation-prevalence)
- ²⁷ Office for Health Improvement & Disparities, Fingertips, Estimated percentage of detected Atrial Fibrillation, 2018/19, (2020). Available at: [Public health profiles - OHID \(phe.org.uk\)](https://www.phe.org.uk/public-health-profiles/ohid/atrial-fibrillation-detected)
- ²⁸ ONS, Mid-year population estimates, 2020, (2021).

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- ²⁹ ONS, Mortality statistics: 148 Atrial fibrillation and flutter, Nomis (2023).
- ³⁰ NHS, Health A to Z. Available at: [High cholesterol - NHS \(www.nhs.uk\)](https://www.nhs.uk) [Accessed 28.05.2023]
- ³¹ NHSD, Health Survey for England 2021, (2023). Available at: [Adults' health: Cholesterol - NDRS \(digital.nhs.uk\)](https://digital.nhs.uk) [Accessed 06.06.2023]
- ³² OHID, 'NHS Health Checks: applying All Our Health', (2022). Available at: [NHS Health Checks: applying All Our Health - GOV.UK \(www.gov.uk\)](https://www.gov.uk) [Accessed 10.10.2023]
- ³³ Office for Health Improvement & Disparities, Fingertips, Cumulative percentage of the eligible population aged 40-74 who received an NHS Health check, 2014/15 - 18/19, (2019), [Public health profiles - OHID \(phe.org.uk\)](https://phe.org.uk)
- ³⁴ Resuscitation Council UK, Defibrillation. Available at: [Defibrillation | Resuscitation Council UK](https://www.resus.org.uk) [Accessed 31.07.2023]
- ³⁵ British Heart Foundation, How your ethnic background affects your risk of heart and circulatory diseases, 2021. Available at: [How your ethnic background affects your risk of heart and circulatory diseases | BHF - BHF](https://www.bhf.org.uk)
- ³⁶ LLR ICB, 5 year plan, (2023). Available at: [Leicester, Leicestershire and Rutland ICB Five Year Plan - LLR ICB](https://www.llricb.nhs.uk)
- ³⁷ NHS, NHS RightCare Toolkit: Physical ill-health and CVD prevention in people with severe mental illness, (2019). Available at: [NHS RightCare » Physical ill-health and Cardiovascular Disease prevention in people with severe mental illness \(england.nhs.uk\)](https://www.england.nhs.uk)
- ³⁸ NHS, NHS Long-term Plan, p.62, (2019). Available at: <https://www.longtermplan.nhs.uk/publication/nhs-long-term-plan/>