

Cardiovascular diseases

Introduction

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

- coronary heart disease (CHD) – disease of the blood vessels supplying the heart muscle
- cerebrovascular disease - disease of the blood vessels supplying the brain
- 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

Who's at risk and why?

In England, cardiovascular disease (CVD) is the most common cause of death, accounting for around one third of all deaths and a significant cause of morbidity in the population. CVD is more likely:

- 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 minorities
- 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
- tobacco use
- excessive alcohol consumption
- stress

About this briefing

The briefing is part of the Leicester JSNA and is intended to give an overview, based on current available information, of the issues involved and links to further sources of information. This briefing will be reviewed at least annually and we welcome your comments and suggestions for improvement. Please send your comments to Sandie.Harwood@leicester.gov.uk or telephone 0116 454 2023.

If you would like to join the JSNA email group and be kept up to date with changes and additions to the JSNA webpages, please contact Sandie Harwood: Sandie.Harwood@leicester.gov.uk

This briefing is not statement of policy of either Leicester City Council or Leicester City Clinical Commissioning Group, nor the Leicester Health and Wellbeing Board.

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 also largely modifiable (treatable).

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.

The level of need in the population

Cardiovascular Disease (CVD)

CVD Prevalence

Nearly 10,000 people in Leicester have been diagnosed with coronary heart disease (CHD), over 45,000 with hypertension and around 4,600 with stroke/TIA².

Table 1: CVD Prevalence in Leicester

16+ years	Hypertension		Stroke			
	CHD Register	Prevalence %	Register	Prevalence %	Register	Prevalence %
England	1,843,813	4.0	7,833,779	16.9	981,836	2.1
Leicester City CCG	9,863	3.3	45,119	14.9	4,626	1.5

Source: Quality Outcomes framework, 2014/15

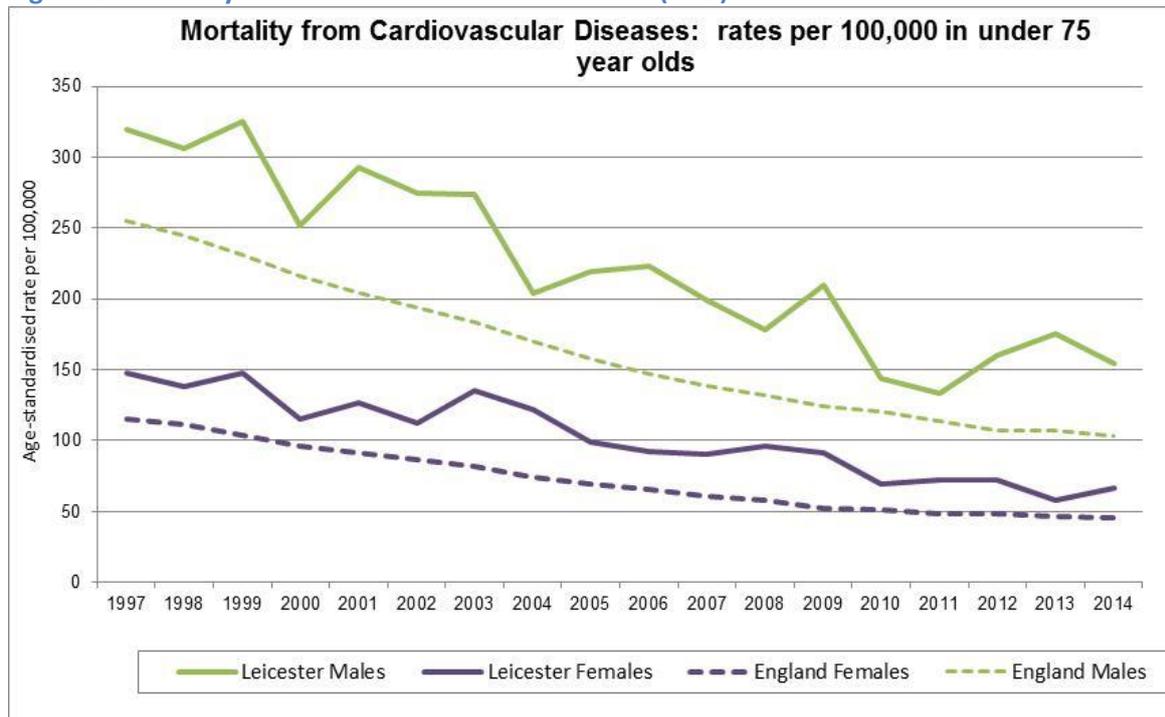
CVD Mortality³

Nationally, CVD accounts for a third of all deaths, and a quarter of premature deaths (under 75 years). Figure 1 shows that in 2014, there were 684 deaths from CVD in Leicester, around 28% of all deaths. CVD is the major contributor to the adverse life expectancy gap between Leicester and England, accounting for 26% of the life expectancy gap in males and 44 % in females⁴. Of all deaths from CVD in Leicester, around half are from coronary heart disease (CHD) and a quarter from strokes.

Trend

CVD mortality rates in Leicester have improved over the past 10 years, showing a reduction of 32%. However, this has not been as great as the England-wide reduction of 39%.

Figure 1: Mortality rates from cardiovascular disease (CVD) in under 75s

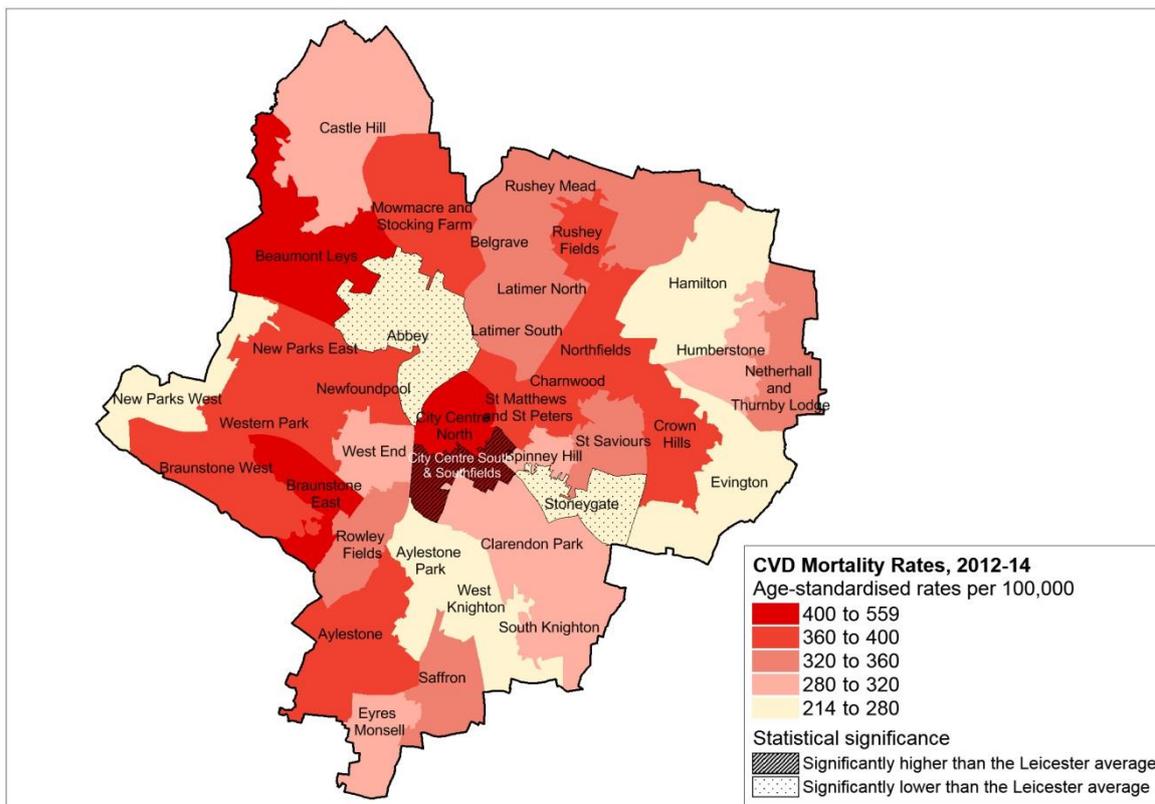


Source: <http://nww.indicators.ic.nhs.uk/webview/>

Variation across Leicester

Figure 2 below shows the variation in CVD mortality across Leicester. Areas with higher rates of CVD deaths correspond to areas of high deprivation, and to South Asian communities in the east of Leicester.

Figure 2: Cardiovascular disease mortality rates in Leicester, 2012-2014



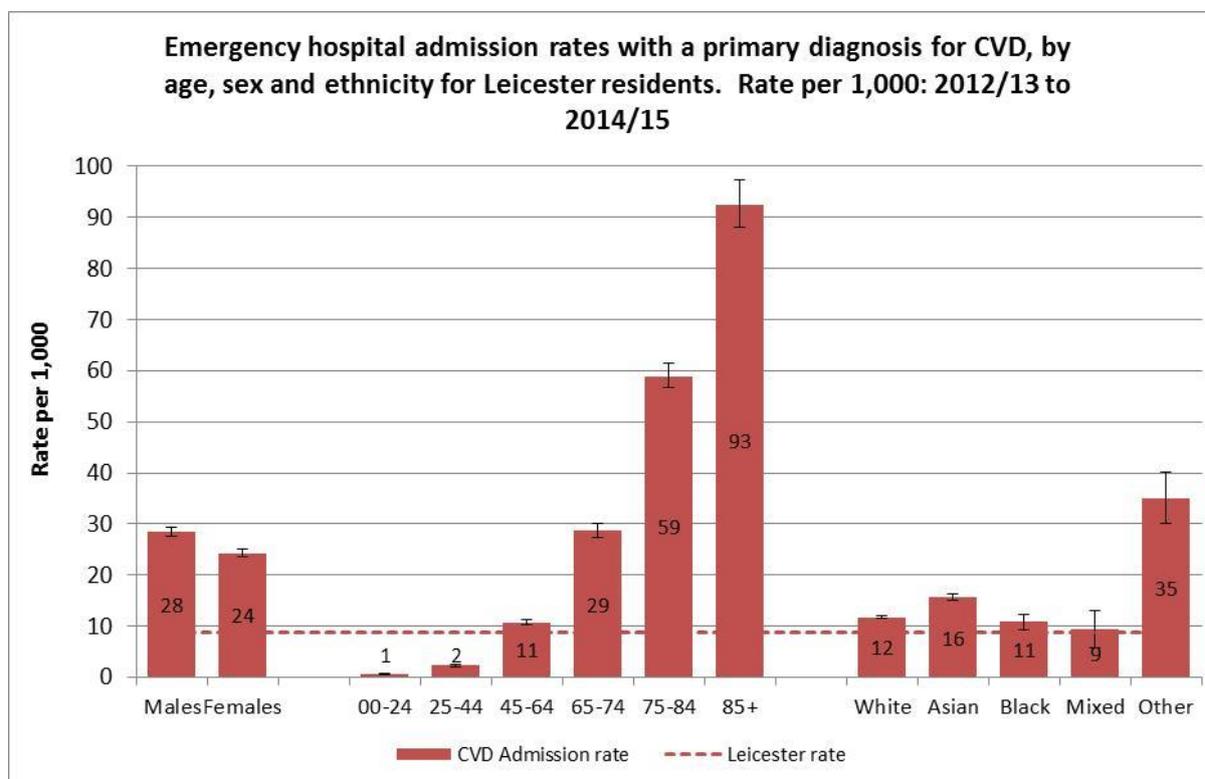
Source: ONS mortality data

CVD Hospital admissions

In 2013/14, there were over 13,000 hospital admissions due to CVD in Leicester. Of these, around a third of admissions were planned and the remainder were unplanned (emergency). Within the emergency CVD admissions, 25% were for CHD, 15% for stroke and 3% for hypertension.

Figure 3 below shows the emergency hospital admission rates by age, sex and ethnicity. Rates are significantly higher in men than women, in age-groups over 65 and in Asian and other ethnic groups compared with White.

Figure 3: Emergency hospital admission rates for Cardiovascular diseases



Data: Secondary Uses Service Inpatient data, ONS mid-year population estimates

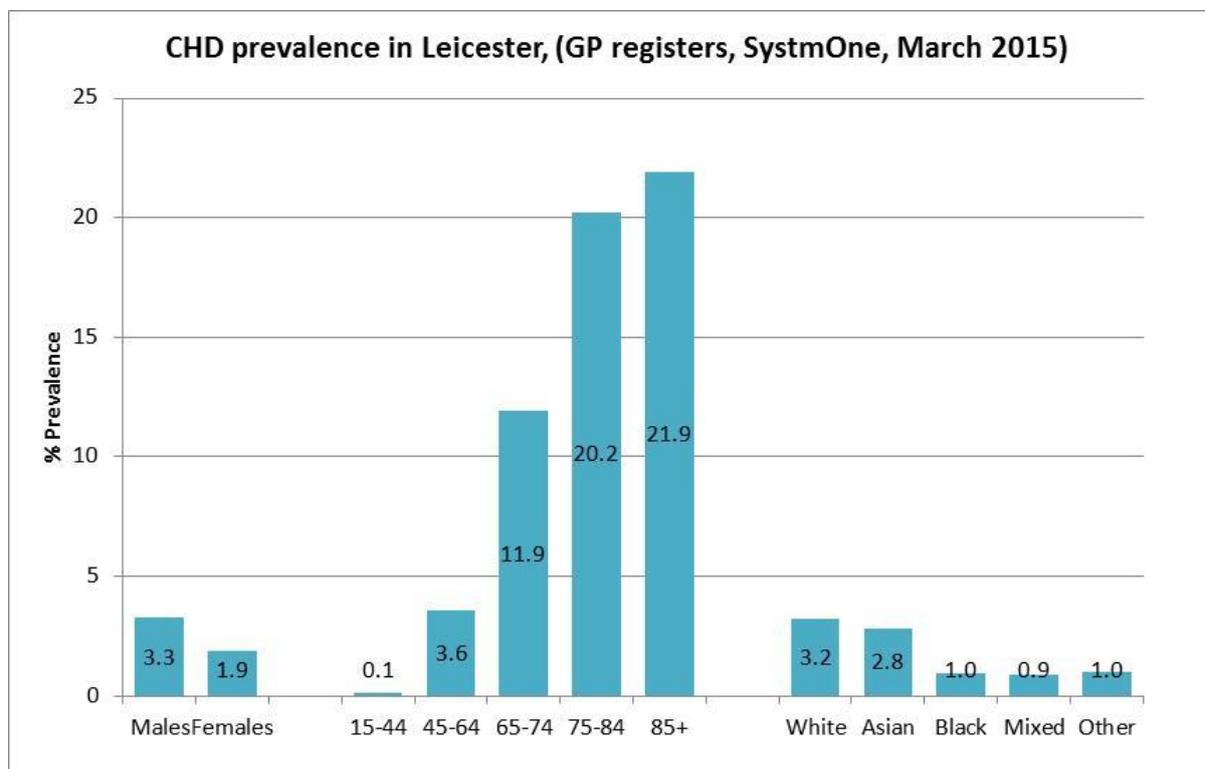
Note: Age-standardised rates are shown for ethnic groups

Coronary Heart Disease

Coronary heart disease (CHD) is a form of CVD caused by 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.

CHD Prevalence

Figure 4: CHD Prevalence in Leicester by age, sex and ethnic group



Data: SystmOne, March 2015

There are nearly 10,000 patients currently diagnosed with CHD on GP registers in Leicester, equivalent to 3.25% of the adult population.

Figure 4 above shows that CHD in Leicester is higher in men than women, higher in the over 65s, rising to 1 in 5 over 75 year olds. Levels are similar in White and Asian populations and lower in Black, Mixed and other ethnic groups.

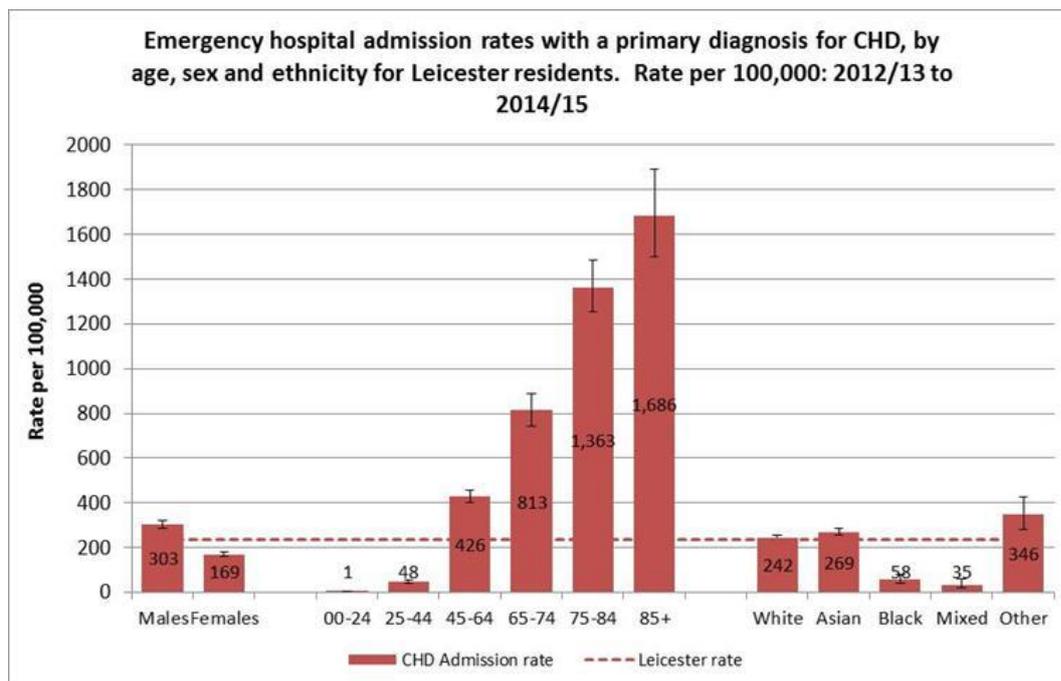
Although CHD prevalence in Leicester is lower than the national average of 4.0%, modelled estimates⁵ indicate there may be a number of people undiagnosed and the true prevalence in Leicester may be as high as 4.8%.

The rate of acute coronary events (heart attacks and severe angina) is much higher among Leicester's South Asian population when compared to white or black ethnic groups⁶. South Asians often develop acute heart problems around 10 years younger than the population as a whole. However, it is encouraging that Leicester South Asians also have higher coronary intervention rates indicating a level of equity in service provision for this group.

CHD Hospital admissions

Figure 5 shows that there were around 800 emergency hospital stays (and patients discharged) for CHD in 2014/15, around 2/3 for men and 1/3 for women. Higher rates were found in the over 65s, accounting for over 50% of all CHD admissions.

Figure 5: Hospital admission rates for CHD by age, sex and ethnicity for Leicester residents



Data: Secondary Uses Service Inpatient data, ONS mid-year population estimates

Note: Age-standardised rates are shown for ethnic groups

Emergency hospital admission rates for CHD are significantly higher in Leicester men than women and increase with age. Rates are similar amongst White, Asian and Other ethnic groups and lower in Black and Mixed ethnicities.

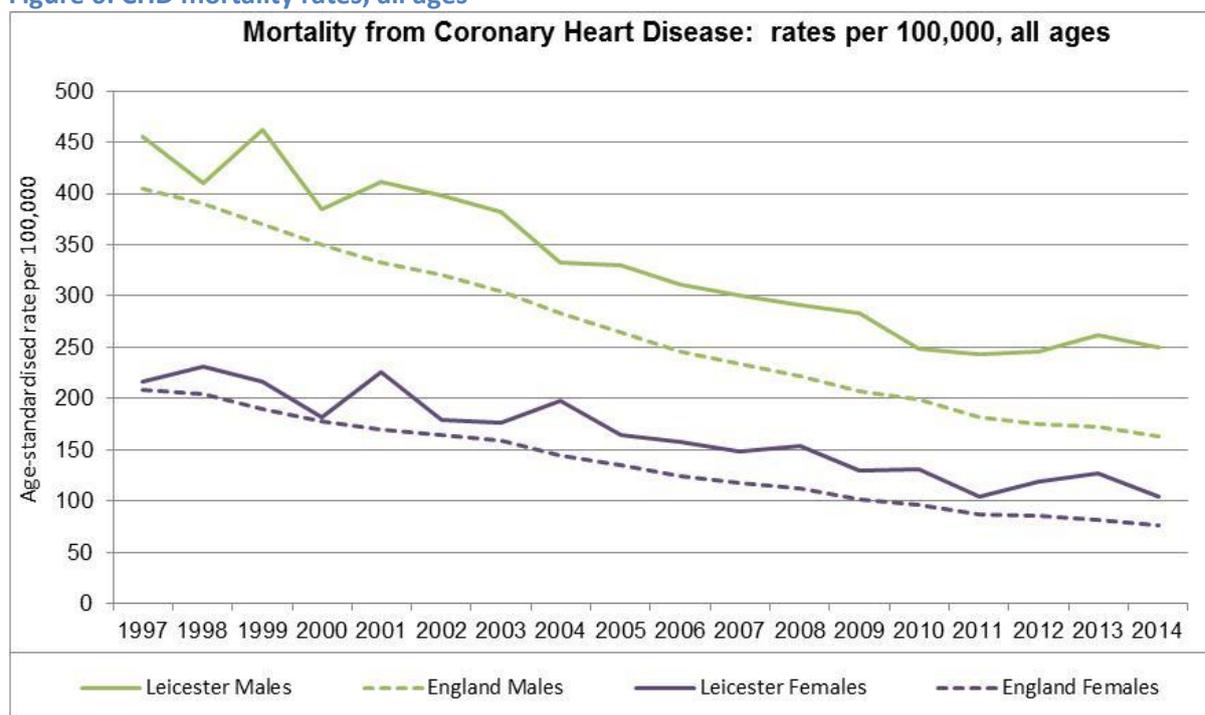
CHD Mortality⁷

Over 60% of excess premature CVD mortality in Leicester is attributable to CHD. In 2014, there were 368 deaths in Leicester from CHD, with 146 of these in under 75 year olds (114 males and 32 females). The CHD mortality rate is significantly higher than the England average for both males and females and a contributor towards the life expectancy gap.

Trend

Figure 6 shows that mortality rates from CHD have decreased by 34% over the past decade in Leicester, from 254 per 100,000 (2004), equivalent to 504 deaths per year to 169 per 100,000 (2014), equivalent to 368 deaths per year. However, this is not as fast as in England overall, where premature mortality rates have decreased by 44%.

Figure 6: CHD mortality rates, all ages

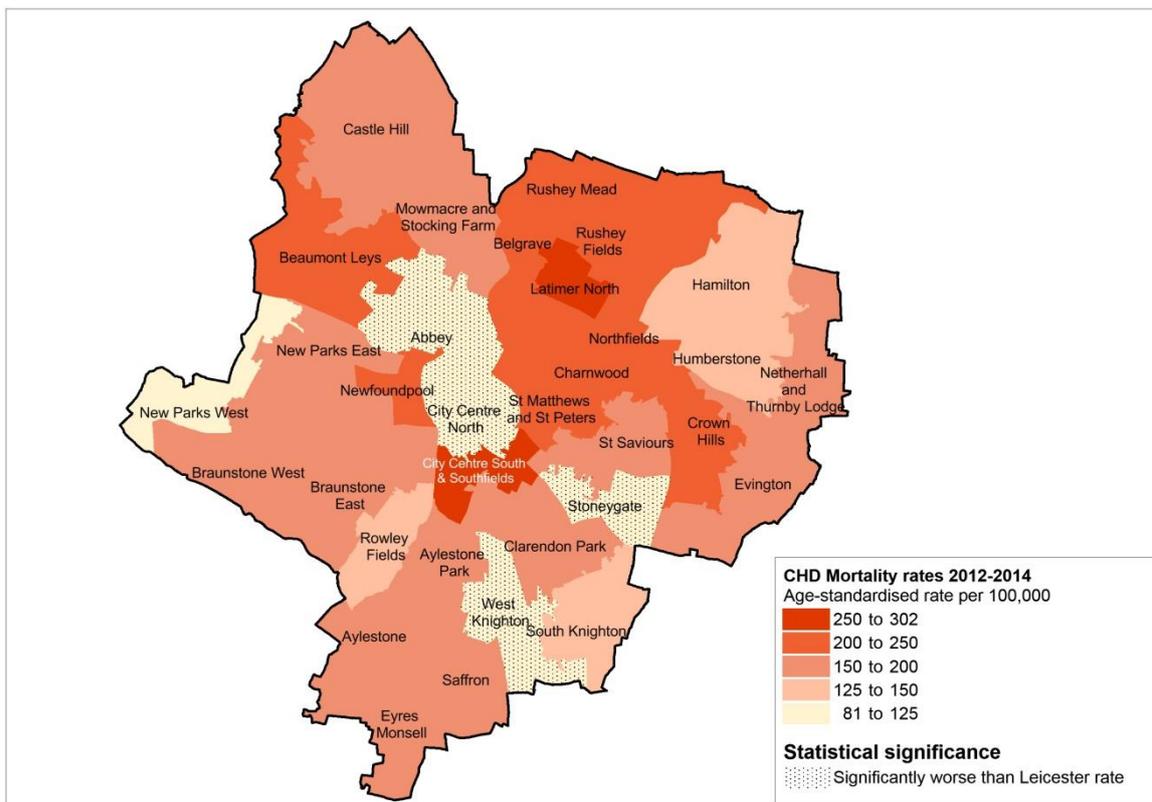


Data: NHS information Centre <http://www.indicators.ic.nhs.uk/webview/>

Variation across Leicester

Mortality rates from CHD vary across Leicester as seen in Figure 7 below. Areas in the east of Leicester have higher death rates - these areas have high levels of deprivation and are also predominantly South Asian communities.

Figure 7: Coronary Heart Disease mortality rates in Leicester



Source: ONS mortality data

Stroke

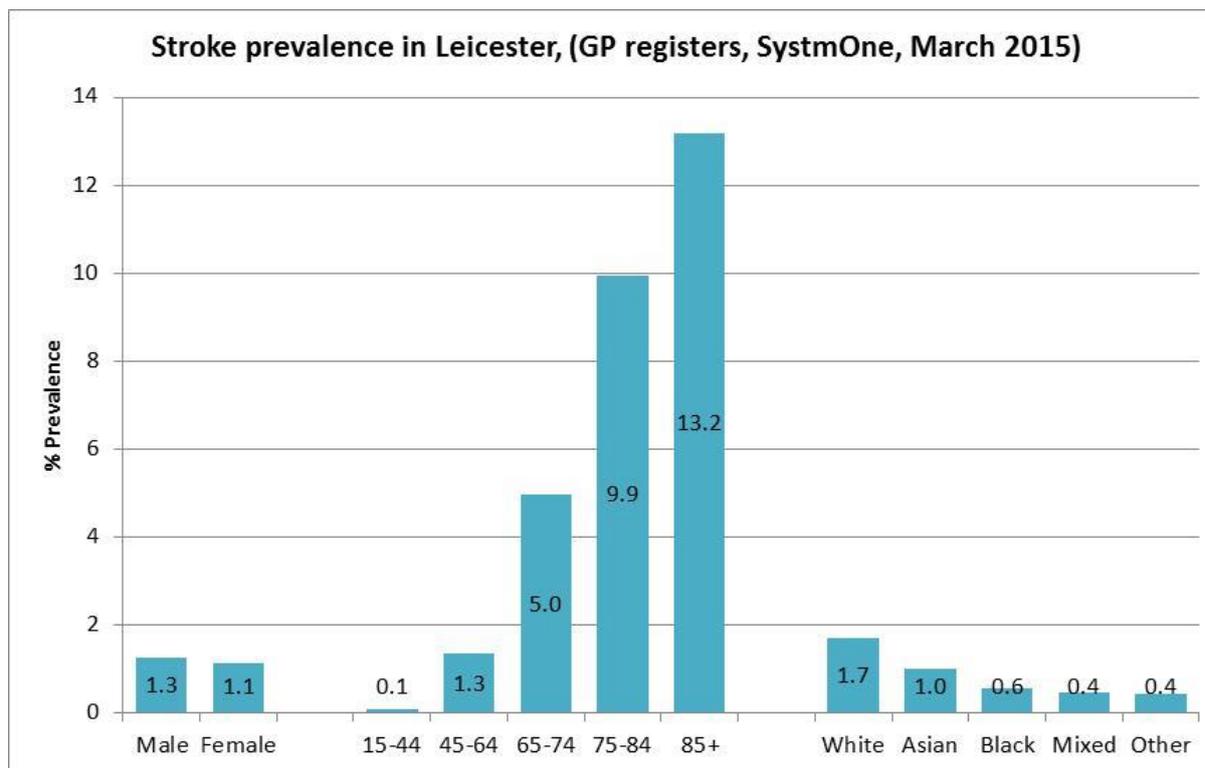
Stroke is caused by the interruption of the blood supply to the brain, usually because a blood vessel bursts or is blocked by a clot. This cuts off the supply of oxygen and nutrients, causing damage to the brain tissue. The most common symptom of a stroke is sudden weakness or numbness of the face, arm 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.⁸

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.

Stroke Prevalence

Figure 8 shows that in Leicester, there are around 4,600 people recorded on GP registers who would have had a stroke or transient ischaemic attacks (TIAs), which is equivalent to around 1.2% of the adult population. Modelled estimates of prevalence suggest a nearly 2% prevalence rate in Leicester's adult population. Prevalence is similar in males and females and higher in the over 65s and 75s. Prevalence is also higher in White ethnic groups than in Asian and other BME groups.

Figure 8: Stroke prevalence in Leicester by age, sex and ethnic group in Leicester

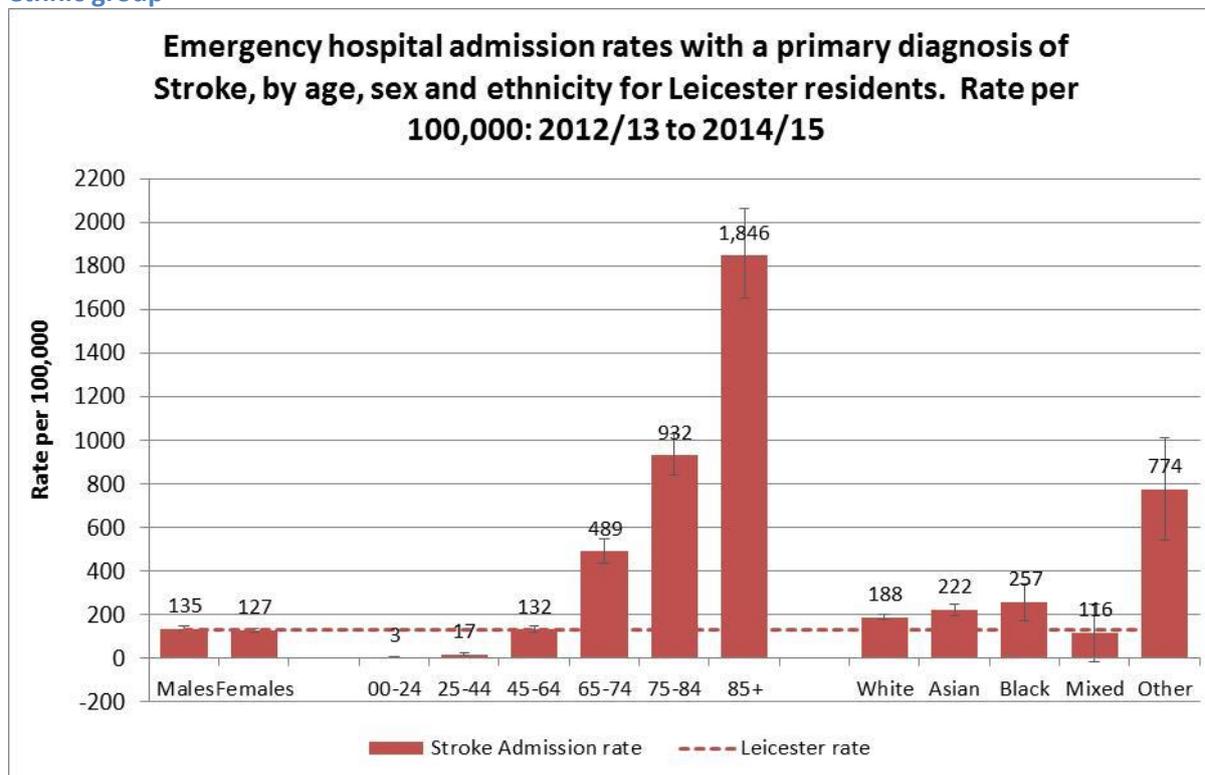


Data: SystmOne, March 2015

Stroke Hospital admissions

Figure 9 shows the emergency hospital admission rates for stroke, equivalent to around 450 emergency hospital stays per year. Similar rates per 100,000 were found in men and women, significantly higher rates in age groups over 65, and similar rates in White, Asian and Black ethnic groups.

Figure 9: Stroke emergency hospital admission rates per 100,000 in Leicester by age, sex and ethnic group



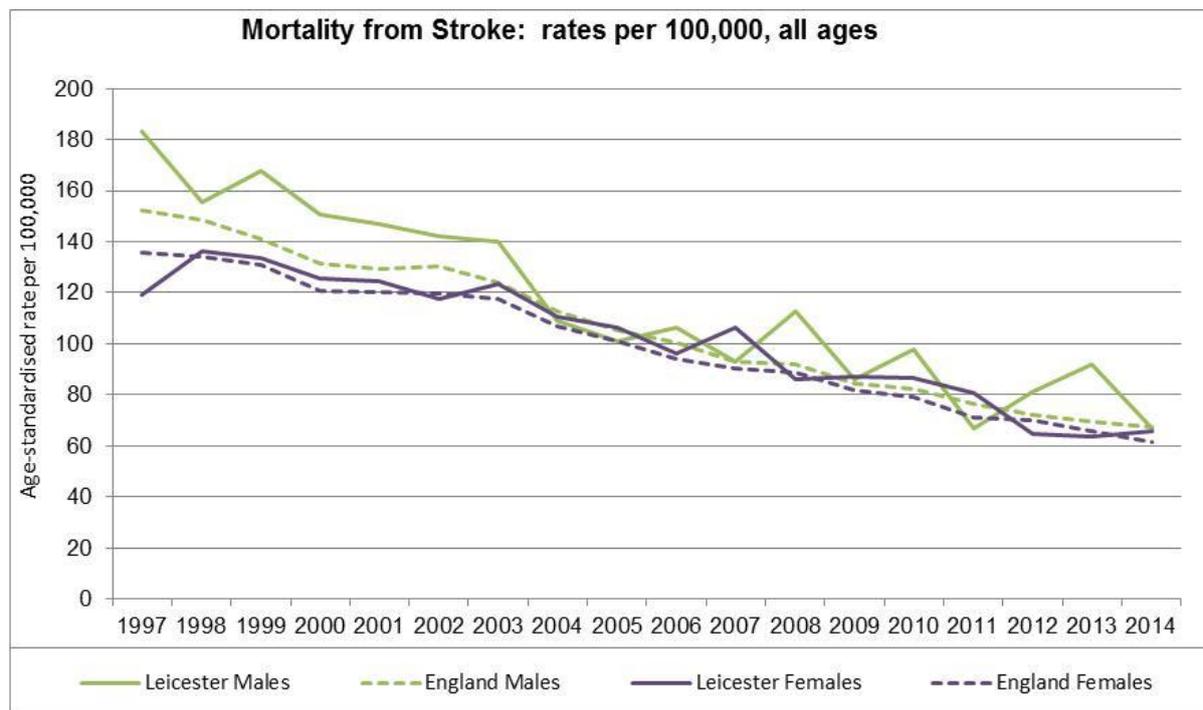
Data: Secondary Uses Service Inpatient data, ONS mid-year population estimates

Note: Age-standardised rates are shown for ethnic groups

Stroke Mortality

Figure 10 shows that stroke mortality in Leicester has fallen by 40% over the last 10 years. Death rates from stroke are similar to the average rates for England and contribute around 1.4% of the life expectancy gap between Leicester and England in males and 5% of the gap in females. In 2014 there were 146 deaths from stroke (58 males, 88 females).

Figure 10: Stroke mortality rates, all ages



Data: NHS information Centre <http://www.indicators.ic.nhs.uk/webview/>:

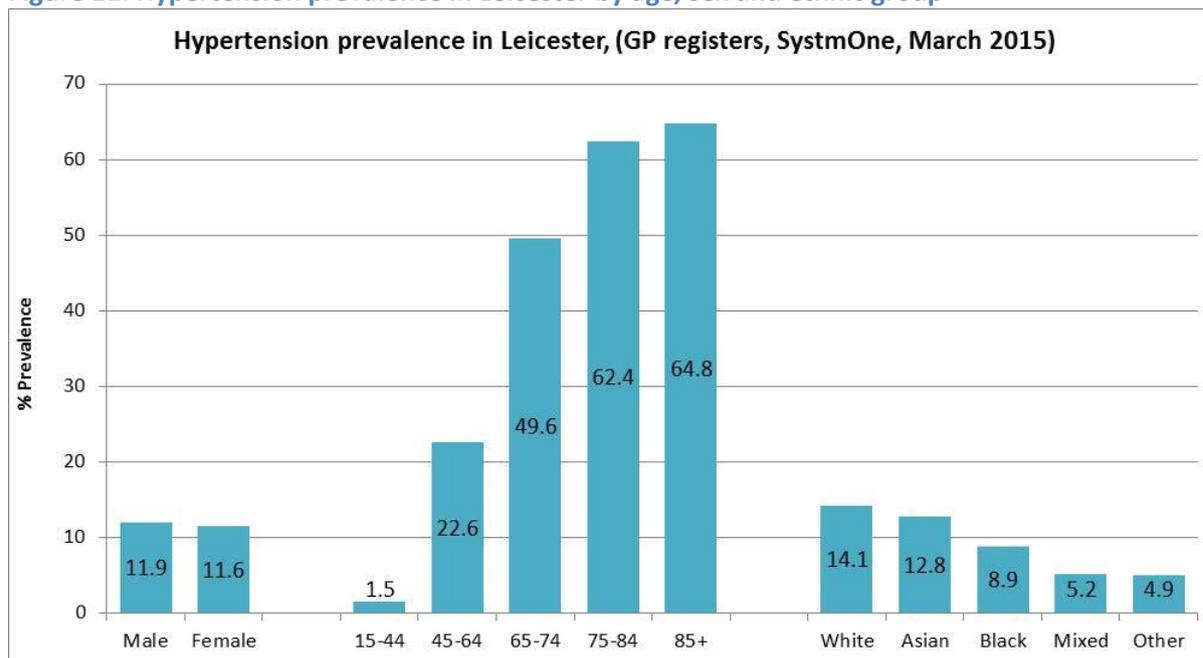
Hypertension

Hypertension Prevalence

In Leicester, there are over 45,000 people recorded on GP registers with diagnosed hypertension, nearly 12% of the population. Modelled estimates of prevalence suggest nearly 26% of Leicester's adult population could have high blood pressure, leaving a large gap to the currently observed numbers. 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.

Figure 11 shows that prevalence is similar in males and females, highest in the 65 age groups. Within ethnic groups, rates of hypertension are highest in the White and Asian ethnic groups.

Figure 11: Hypertension prevalence in Leicester by age, sex and ethnic group



Data: SystmOne, March 2015

Hypertension Mortality

In 2014, there were 34 deaths in Leicester in 2014, with hypertension indicated as the underlying cause. Of them, 15 were among men and 19 among women.

Current services in relation to need

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.

The Leicester Clinical Commissioning Group (CCG) strategic initiatives focus on these two areas by commissioning patient education programmes and a clinical education programme in primary care. In addition, the CCG supports, via promotion in GP surgeries, prevention campaigns initiated by local and national bodies.

Ascertainment

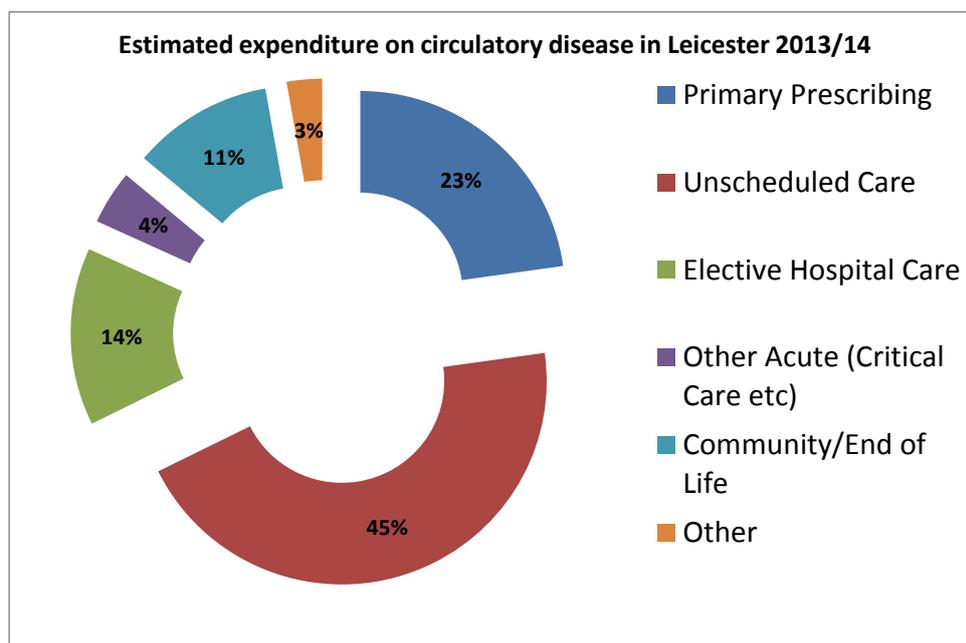
As previously mentioned, Leicester has a predicted gap between diagnosis and prevalence. The Local Authority commissions the NHS Health Checks programme. This programme invites all 40-74 year olds without a current diagnosis of CVD or diabetes to be screened.

In addition, other services, focused on management as an outcome, also have a detection element (see below).

Management

The majority of estimated spend on CVD in Leicester is on hospital care, 45% for emergency (unscheduled) care, 14% for elective and 4% for critical hospital care (Figure 12). Nearly a quarter of cost of care is accounted for by costs of prescribing in primary care.

Figure 12: Distribution of spend on care for patients with cardiovascular conditions in Leicester



Data: NHS Programme Budgeting

Integrated Cardiovascular Service

The aim of the service, procured by the CCG, 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.

Projected services use and outcomes in 3-5 years and 5-10 years

Table 2 below gives the actual, estimated (modelled) and projected prevalence in Leicester for hypertension, coronary heart disease and stroke. The projected prevalence is a simple forecast based on the recorded prevalence from 2010-2015, while the modelled estimates are based on the national prevalence figures and the local population structure.

Table 2: Actual, projected and modelled prevalence for patients with Cardiovascular diseases in Leicester

	England: recorded prevalence 2015 %	Leicester: number on register 2015	Leicester: recorded prevalence 2015 %	Projected prevalence 2020 %	Modelled prevalence
Hypertension (16+ years)	16.9	45,119	14.9	15.2	26.6
Coronary Heart Disease (16+ years)	4.0	9,863	3.3	2.9	5.1
Stroke (16+ years)	2.1	4,626	1.5	1.5	2.1

Data: QOF Prevalence March 2015, APHO Prevalence models

While the short-term projections (2020) do not indicate any significant increase in registration rate (around 100 net increase in the number of cases, across all three condition), the modelled estimates are higher than the recorded prevalence, suggesting that a proportion of cases may still be undiagnosed.

Unmet needs and service gaps

There are clear inequalities in CVD health outcomes between different population groups in Leicester, linked to ethnicity and deprivation and a more nuanced understanding of unmet need in affected groups is necessary.

The continued reliance of secondary health care to deliver a large proportion of care for CVD patients indicate a possible need for more integrated pathways of care and diagnostic and therapeutic shift to the community.

There is also an identified gap between estimated prevalence and rate of recorded diagnosis and, in seeking to address this, services need a robust approach to earlier detection, diagnosis and treatment (of both established disease and any modifiable risk factors).

Recommendations for consideration by commissioners

The key recommendations for commissioners include:

- Development of a shared preventative strategy for all commissioners and providers of clinical care and public health interventions.
- Establishing a joint approach to early detection to close the 'prevalence gap' and reduce variance in ascertainment and outcome for people at high risk or with an established cardiovascular condition
- Closing the inequality gap through better understanding of need in affected populations and taking appropriate action by care commissioners and providers.
- Further improvements in CVD care and prevention provided in the community.

Key contacts

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References

¹ World Health Organisation definition

² Quality outcomes framework database, 2014/15: <http://www.hscic.gov.uk/catalogue/PUB18887>

³ ONS Mortality data

⁴ Public Health England, Breakdown of the life expectancy gap between Leicester as a whole and England as a whole, by cause of death, 2010-12

⁵ Public Health England: Disease Prevalence Models: <http://www.apho.org.uk/DISEASEPREVALENCEMODELS>

⁶ Annual Report of the Director of Public Health, 2007.

⁷ Health and Social Care Information Centre, indicator portal: <https://indicators.hscic.gov.uk/webview/>

⁸ World Health Organisation