

Contents

3	Diabetes.....	2
3.1	Introduction	2
3.2	Causes and risk factors.....	3
3.3	Local data and unmet need.....	6
3.3.1	Numbers affected – known to services	6
3.3.2	Numbers affected – estimates	7
3.3.3	Unmet need	9
3.4	Inequalities.....	10
3.4.1	Age	10
3.4.2	Gender.....	11
3.4.3	Ethnicity	12
3.4.4	Sexuality	13
3.4.5	Disability	13
3.4.6	Socio-economic disadvantage.....	13
3.4.7	Location within Hackney and the City	15
3.5	Comparisons with other areas and over time	15
3.5.1	Prevalence.....	16
3.5.2	Complications of diabetes.....	16
3.6	Evidence and good practice	20
3.6.1	Prevention	21
3.6.2	Identification and early intervention	22
3.6.3	Treatment, care and support	23
3.7	Services and support available locally	25
3.7.1	Prevention	25
3.7.2	Identification and early intervention	25
3.7.3	Treatment, care and support	26
3.8	Service gaps and opportunities	27
3.9	References.....	28

3 Diabetes

3.1 Introduction

Diabetes refers to a group of conditions characterised by the presence of high levels of sugar (glucose) in the blood. It is the most common form of disease affecting the endocrine system. The endocrine system refers to the collection of glands in the body that regulate hormone levels. The focus of this section is diabetes mellitus; a shorthand of 'diabetes' will be used throughout. Diabetes relates to the impaired production or regulation of, or sensitivity to, insulin, a hormone produced in the pancreas gland.

Diabetes is the 11th leading cause of disability-adjusted life years (DALYs) in England, and the contribution of diabetes to DALYs appears to be increasing. [1] Diabetes is a serious condition and, when not well managed, those affected are at increased risk of a range of complications, including heart disease, nerve weakness, stroke, blindness, kidney disease and vascular disease (which can lead to amputations). The development of diabetes can therefore further perpetuate health inequalities.

The most common form of diabetes in adults (around 90% of cases) is type 2 diabetes (see Box 1). It is estimated that almost 600,000 people in the UK with type 2 diabetes are not aware of their condition. This is because the signs and symptoms may not be obvious and it can take some years before the condition is diagnosed. Up to 50% of people may already have complications when they are diagnosed with type 2 diabetes. However, there are a range of evidence-based interventions that can help to delay or prevent the development of the condition, and reduce the risk of complications.

Box 1: Definitions used in this section

Body mass index (BMI) – a measure of the extent to which a person’s weight is healthy for their height. BMI is calculated by dividing body weight (kilograms) by height (metres) squared. See ‘Obesity’ section of this JSNA chapter for more detail.

Gestational diabetes - a condition that affects some women during pregnancy and is a risk factor for developing type 2 diabetes (see below).

HbA1c – refers to glycated haemoglobin, which identifies the average glucose concentration in the blood. A consistently high HbA1c level (above 6% or 48mmol/mol)¹ is associated with a greater risk of developing diabetes-related complications. [2]

Insulin dependent diabetes mellitus (IDDM – type 1) – thought to occur due to disease of the immune system, which attacks the cells that produce insulin (a hormone that controls the amount of sugar in the blood), although the exact mechanism is not fully understood.

Non-insulin dependent diabetes mellitus (NIDDM – type 2) – occurs when the body does not produce enough insulin, or cells in the body become resistant to it.

Non-diabetic hyperglycaemia (also known as ‘pre-diabetes’ or impaired glucose regulation) – refers to blood glucose levels that are raised, but are not in the diabetic range. This is defined as an HbA1c test result of 6.0-6.4% (or 42mmol/mol – 47mmol/mol).

There are several other specific forms of diabetes that are not covered in this section – including diabetes caused by an underlying condition (such as cystic fibrosis or chronic pancreatitis), drug or chemical induced diabetes, and diabetes caused by genetic anomalies.

3.2 Causes and risk factors

Type 1 diabetes is an autoimmune condition, which means the immune system attacks the pancreas (where insulin is produced) by mistake. Type 1 diabetes often runs in families, although it is not known exactly what triggers the immune system response. [3]

Type 2 diabetes is a condition where either the pancreas does not produce enough insulin or cells in the body become resistant to it. Insulin resistance is a process whereby body cells become less sensitive to the hormone insulin (often due to a consistently high blood sugar level). [4]

Gestational diabetes develops during pregnancy and usually, but not always, disappears after birth. It means the body cannot keep producing enough insulin to

¹ Millimoles per mole – a unit of measurement, usually of the concentration of a substance in a given amount of liquid.

meet the extra needs of the pregnancy. It is thought to occur in 3-5% of all pregnancies. [5] [3] Gestational diabetes is a risk factor for type 2 diabetes.

Table 1, Table 2 and Table 3 below highlight the main risk factors associated with developing type 1, type 2 and gestational diabetes. Several of these risk factors are associated with lifestyle and behavioural factors such as physical activity, smoking, alcohol consumption and having a healthy diet, all of which are discussed in the 'Lifestyle and behaviour' chapter of the JSNA.

Table 1: The main risk factors for type 1 diabetes [6] [7] [8]

Risk factor	Details
Family history	Having a close relative (parent, brother or sister) with type 1 diabetes increases the chance of having the condition from 0.5% to around 6%.

Table 2: The main risk factors for type 2 diabetes [6] [7] [8]

Risk factor	Details
Age	People over the age of 40 have a higher risk of diabetes – for every one year increase in age, the odds of having ‘pre-diabetes’ increase by 5.7%. [5]
Gender	<p>Males (specifically those from White, Mixed or Other ethnic backgrounds) are slightly more likely to develop diabetes than females. Evidence suggests there are more undiagnosed cases of diabetes and ‘pre-diabetes’ in males. [5]</p> <p>Women who have previously had gestational diabetes during pregnancy, or women with polycystic ovary syndrome (PCOS), are at increased risk of diabetes. [2]</p>
Ethnicity	People from Asian or Black ethnic backgrounds are almost three times as likely to develop diabetes as other groups. [5] [9]
Socio-economic deprivation	People living in the most deprived areas of the country are more likely to have diabetes than people living elsewhere. [5]
Family history of diabetes	If type 2 diabetes is diagnosed before the age of 50, the risk of that person’s child developing diabetes is one in seven. If diagnosed after the age of 50, the risk is one in 13. [5] [9]
Increased BMI and/or waist circumference	For every one unit BMI increase, the odds of a person having ‘pre-diabetes’ increase by 6.1%. [5] [9]
Ever had high blood pressure, heart attack or stroke	People with this type of cardiovascular disease (CVD) history are more likely to develop diabetes than those without. Prevalence of CVD in people with diabetes is around 25%. [5] [9]
Previous gestational diabetes	Women who have previously had diabetes in pregnancy are more likely to develop the condition than those who have had previous ‘normal’ births (see Table 3). [8]

Table 3: The main risk factors for gestational diabetes [6] [7] [8]

Risk factor	Details
Maternal age	Women over the age of 25 have a 3.3 times greater chance of developing gestational diabetes than those under the age of 25. [3] [8]
Ethnicity	Women from non-White ethnic backgrounds are more likely to develop gestational diabetes than White women. In particular women from a South East Asian background are 7.6 times more likely than those of White ethnicity to develop gestational diabetes (the risk is 11.3 times higher in people of Indian origin). Women of Black ethnicity have a 3.1 higher chance of developing gestational diabetes. [3] [8]
Family history of diabetes	Women with a family history of diabetes have a 2.7 times greater risk of developing gestational diabetes than those with no family history of the condition. [3] [8]
Previous large baby	Women who have had previous pregnancies with large babies (above 4.5kg) are at increased risk of developing gestational diabetes. [8]
Previous gestational diabetes	Women with a previous diabetic pregnancy are 23.6 times more likely to develop the condition compared to those who had previous 'normal' births. [8]
Obesity	Women with a BMI above 30 have a 2.6 times greater risk of gestational diabetes than those with a BMI under 25. [8]

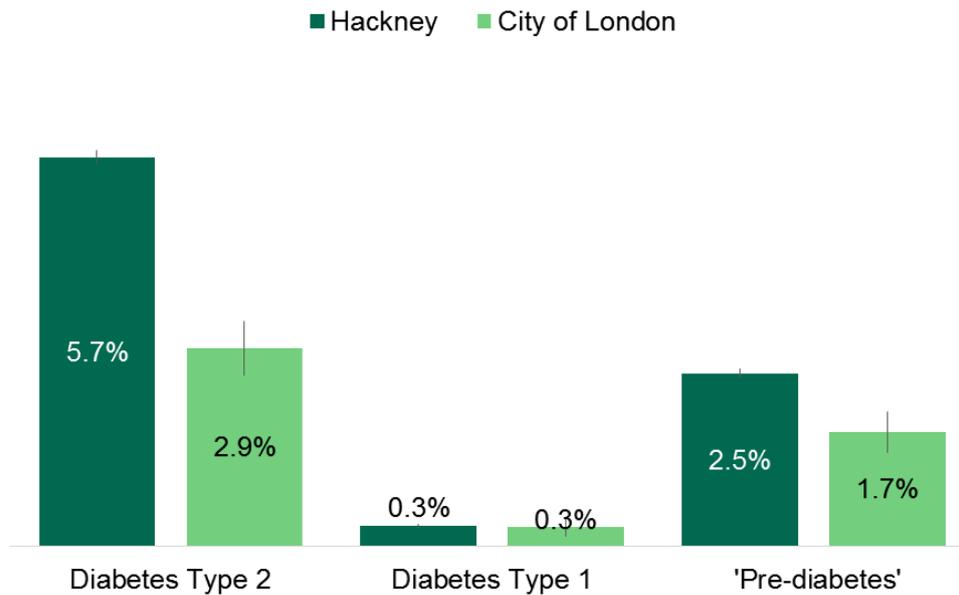
3.3 Local data and unmet need

3.3.1 Numbers affected – known to services

Locally, 13,155 adults in Hackney and 219 in the City of London are diagnosed with diabetes (type 1 or type 2), most of whom have type 2 diabetes (Figure 1). The percentage with type 1 diabetes is lower than reported in the literature, which indicates a greater relative burden of type 2 diabetes in the local population compared to nationally. [4]

In addition, there are a further 5,562 (Hackney) and 116 (City) residents identified with 'pre-diabetes' (non-diabetic hyperglycaemia).

Figure 1: Percentage of adults in Hackney and the City with GP-recorded diabetes and 'pre-diabetes' (18+, 2017)



Source: Extracted from the local GP register by Clinical Effectiveness Group (CEG), Blizard Institute, April 2017.

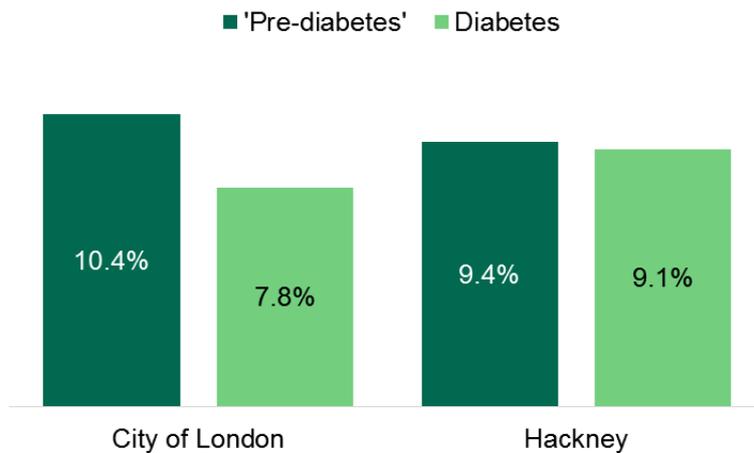
Note: Data cover residents of Hackney and the City registered with a GP in Hackney, the City of London, Tower Hamlets and Newham.

3.3.2 Numbers affected – estimates

The most robust estimates on the prevalence of diabetes and 'pre-diabetes' have been produced by Public Health England (PHE), and are derived from national surveys and applied to local population data. However, it should be noted that modelled estimates that use national data for local use must be treated with some caution, as the models do not account for the significant ethnic diversity and high population churn of our local population. This may result in an over- or under-estimate of the 'true' prevalence by these models.

These estimates suggest that the underlying prevalence of diabetes in Hackney is around 9% and that there is a similar prevalence of 'pre-diabetes' (Figure 2).

Figure 2: Estimated prevalence in Hackney and the City of diabetes (type 1 and 2) and 'pre-diabetes' (16+, 2016).

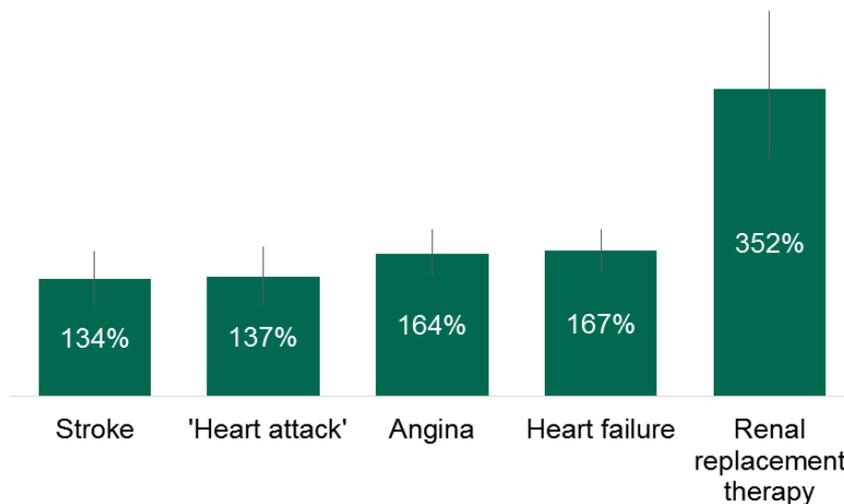


Source: PHE Fingertips [7]

Note: Diabetes is defined as self-reported doctor-diagnosed diabetes or an HBA1c of 6.5% (48mmol/mol) or more. Confidence intervals not available.

People with diabetes are more likely to experience certain cardiovascular disease (CVD) conditions than people without diabetes. The estimated additional risk of experiencing myocardial infarction ('heart attack'), heart failure, angina, stroke or renal replacement therapy for people with diabetes is more than double that of people without diabetes (Figure 3).

Figure 3: Estimated age-adjusted additional risk of CVD-related conditions in Hackney and the City patients with diabetes, compared to those without diabetes (all ages, 2012/13)



Source: PHE Fingertips [7]

Notes: Additional risk is derived from the National Diabetes Audit (in 2009/10) where patients with and without diabetes were followed up for three years to record the chances of a person experiencing the condition at least once during that time. The standardised ratio is expressed here as a percentage increased risk.

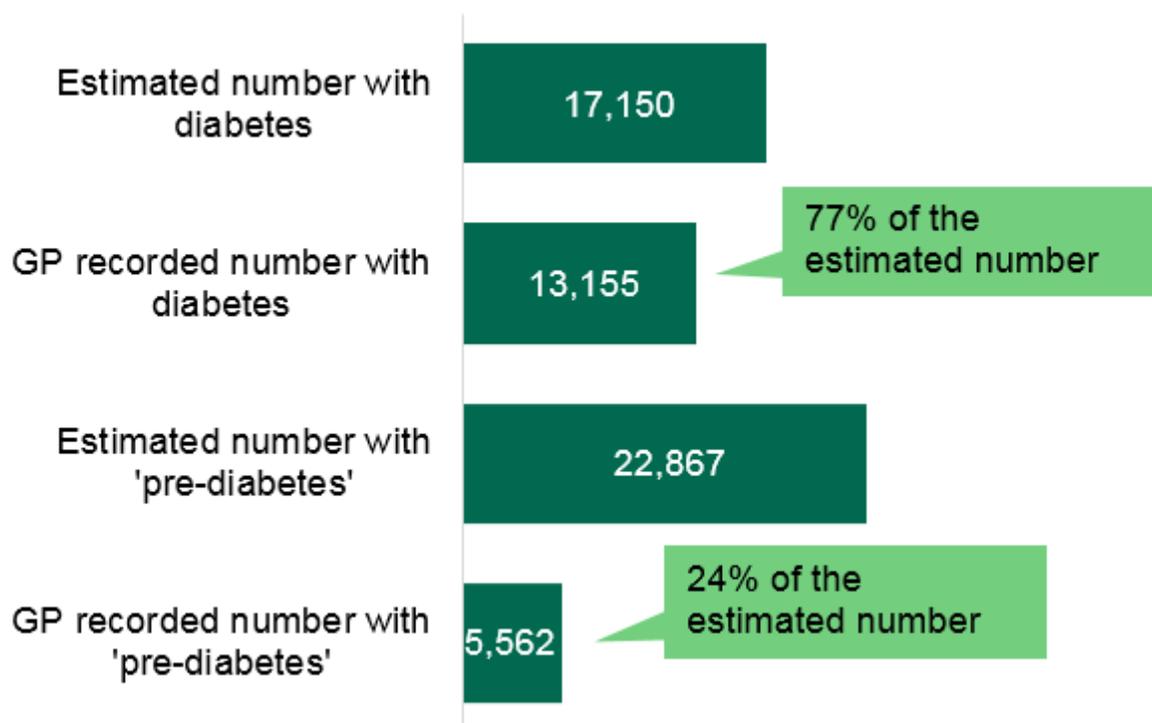
3.3.3 Unmet need

Fewer patients are recorded with diabetes or 'pre-diabetes' locally than estimates suggest (Figure 4 and Figure 5). In particular, according to these data, three quarters (76%) of people living with 'pre-diabetes' in Hackney are not known to their GP; in the City, the gap between recorded and estimated prevalence of 'pre-diabetes' is even higher (82%). In addition, in the City only around a third (35%) of the expected number of people with diabetes are recorded with a diagnosis by their GP.

However, when interpreting these comparisons, it is important to remember the limitations of modelled estimates described in Section 3.3.2. Modelled estimates are based on national samples and applied to the local population.

It is important to note that the identification of 'pre-diabetes' in primary care depends on random blood sugar findings. Therefore people who attend their GP more frequently are more likely to be diagnosed with the condition.

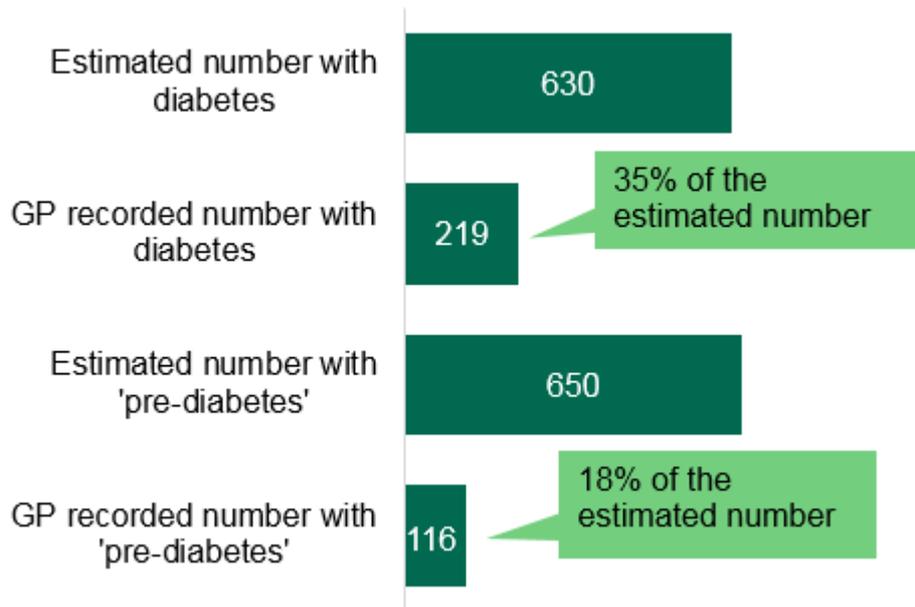
Figure 4: Estimated and recorded prevalence of diabetes (type 1 and type 2) and 'pre-diabetes' in Hackney (16+, 18+, 2017)



Sources: Estimates from PHE Fingertips. [7] Recorded numbers extracted from the local GP register by CEG, Blizard Institute, April 2017. [10]

Note: Data cover residents of Hackney and the City registered with a GP in Hackney, the City of London, Tower Hamlets and Newham. Estimates predict a prevalence for people aged 16+ while GP-recorded cases cover people aged 18+.

Figure 5: Estimated and recorded prevalence of all diabetes and 'pre-diabetes' in the City of London (16+, 18+, 2017)



Source: PHE Fingertips. [7] Extracted from the local GP register by CEG, Blizard Institute, April 2017. [10]

Note: Data cover residents of Hackney and the City registered with a GP in Hackney, the City of London, Tower Hamlets and Newham. Estimates predict a prevalence for people aged 16+ while GP-recorded cases cover people aged 18+.

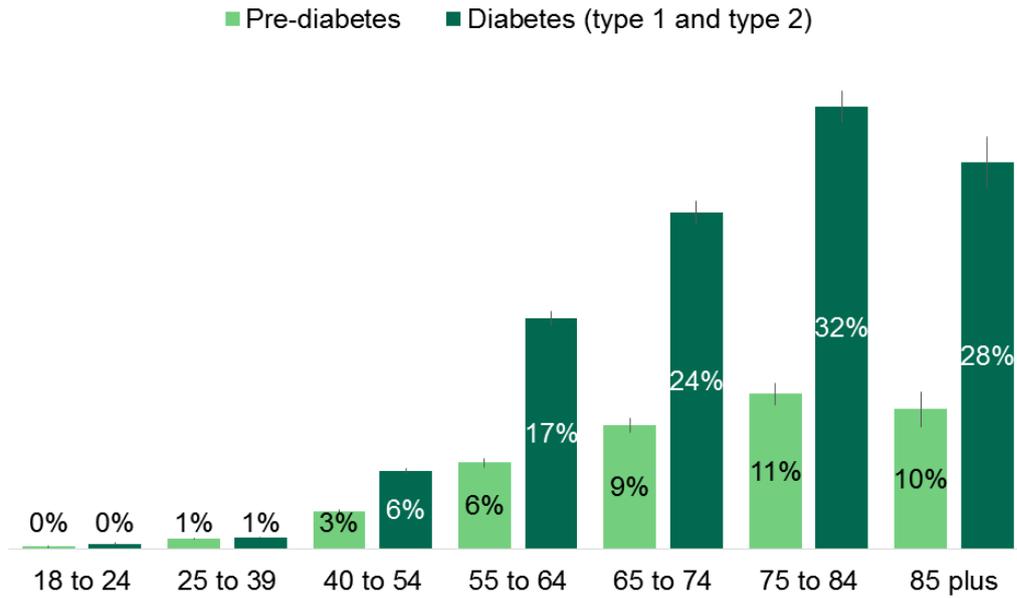
3.4 Inequalities

3.4.1 Age

As described in the literature, recorded prevalence of diabetes and 'pre-diabetes' increases with age in Hackney and the City (Figure 6).

Of those Hackney and the City residents with type 2 diabetes, the majority (96%) are age 40 or over; this is also true for people identified with 'pre-diabetes'. Patients with type 1 diabetes tend to be younger – 60% of people with the condition are aged 18-39.

Figure 6: Percentage of adults in Hackney and the City with GP-recorded diabetes (type 1 and type 2) and 'pre-diabetes' (18+, 2017)

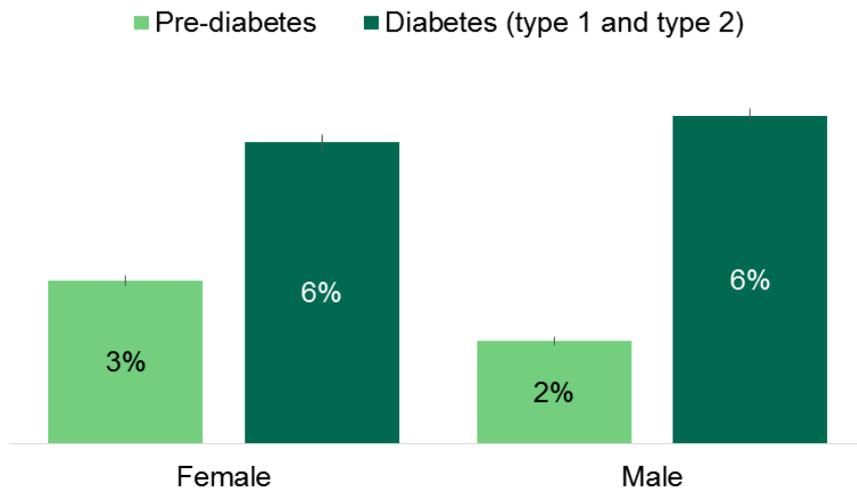


Source: Extracted from the local GP register by CEG, Blizard Institute, April 2017. [10]
 Note: Data cover residents of Hackney and the City registered with a GP in Hackney, the City of London, Tower Hamlets and Newham.

3.4.2 Gender

Diabetes (type 1 and 2) is slightly more prevalent in males than females locally, although females are more likely than males to be diagnosed with 'pre-diabetes'. (Figure 7).

Figure 7: Percentage of adults in Hackney and the City with GP-recorded diabetes (type 1 and type 2) and 'pre-diabetes' (18+, 2017)

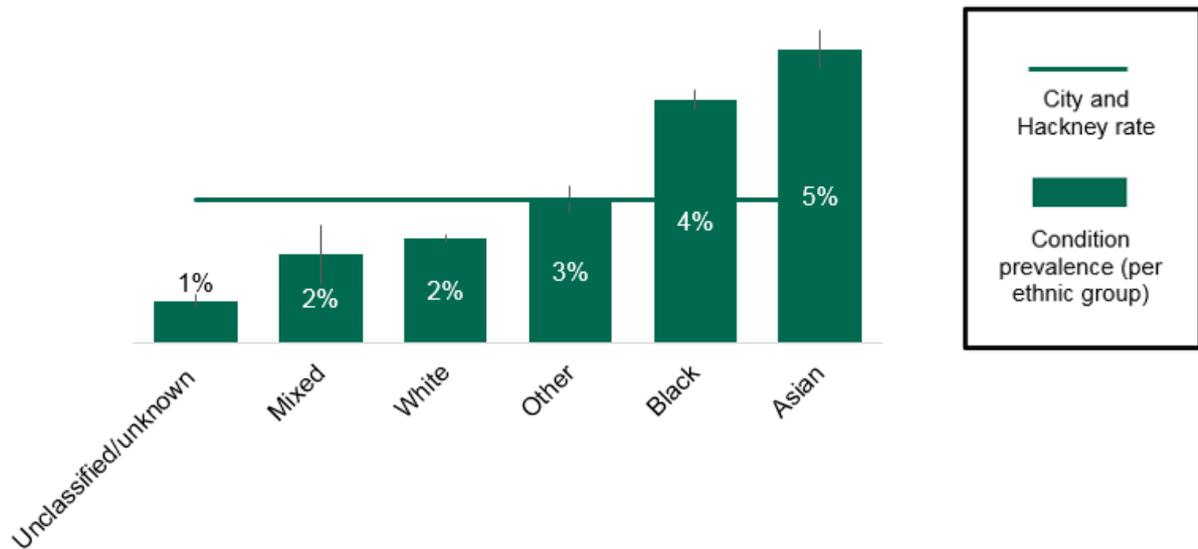


Source: Extracted from the local GP register by CEG, Blizard Institute, April 2017. [10]
 Note: Data cover residents of Hackney and the City registered with a GP in Hackney, the City of London, Tower Hamlets and Newham.

3.4.3 Ethnicity

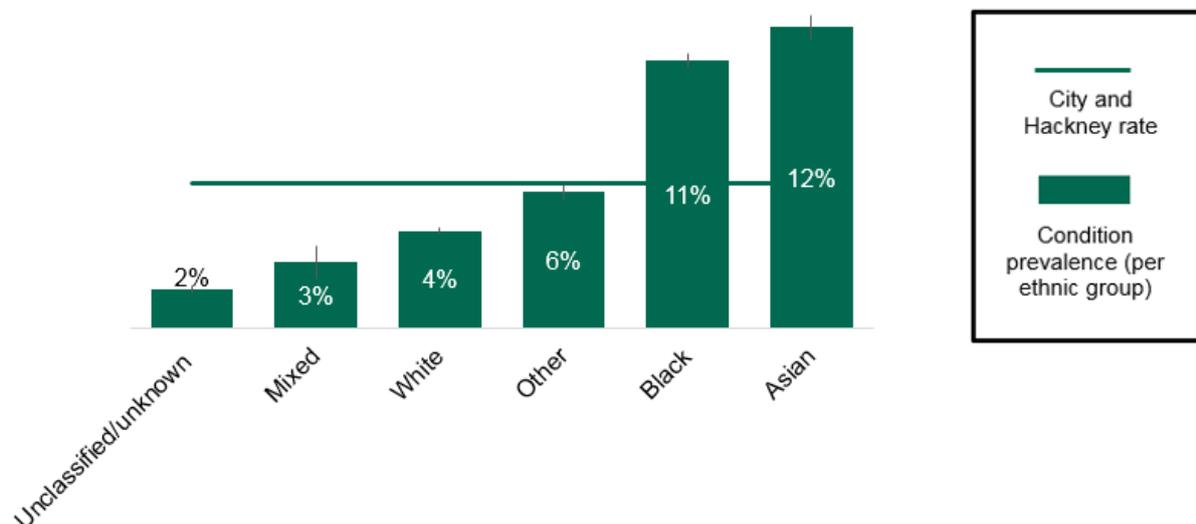
According to local GP records, adults of Black and Asian backgrounds have the highest prevalence of both diabetes and ‘pre-diabetes’ (Figure 8). At least one in every 10 adults from these groups is recorded as having diabetes.

Figure 8: Percentage of adults in Hackney and the City with GP-recorded ‘pre-diabetes’ (18+, 2017)



Source: Extracted from the local GP register by CEG, Blizard Institute, April 2017. [10]
 Note: Data cover residents of Hackney and the City registered with a GP in Hackney, the City of London, Tower Hamlets and Newham.

Figure 9: Percentage of adults in Hackney and the City with GP-recorded diabetes (type 1 and type 2) (18+, 2017)



Source: Extracted from the local GP register by CEG, Blizard Institute, April 2017. [10]

Note: Data cover residents of Hackney and the City registered with a GP in Hackney, the City of London, Tower Hamlets and Newham.

3.4.4 Sexuality

There is insufficient information on local rates of diabetes by sexual identity and orientation to draw local inference.

3.4.5 Disability

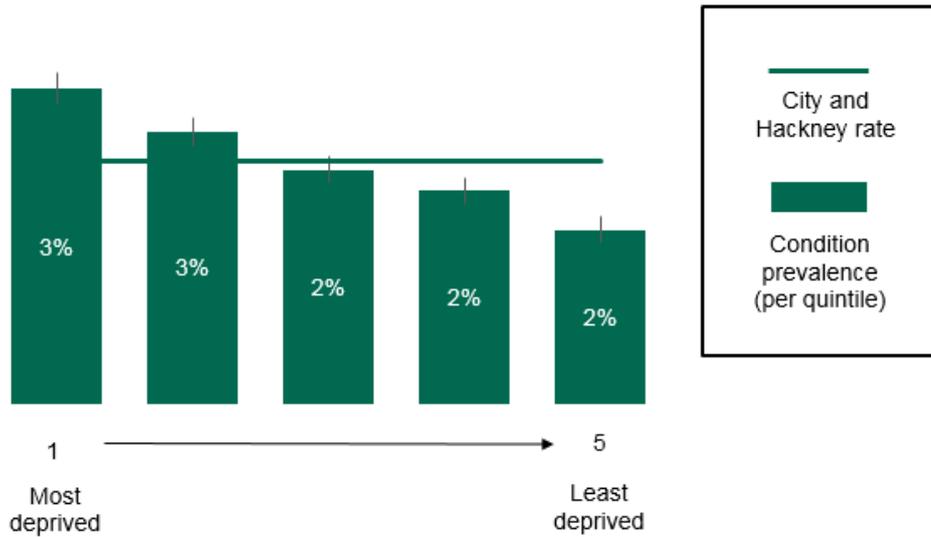
Evidence from the JSNA 'Lifestyle and behaviour' chapter suggests that adults with a disability are more exposed to lifestyle risk factors for developing diabetes. For example, they are less likely to take part in regular physical activity and may also face difficulties in achieving a healthy diet. [11]

A complication of poorly controlled diabetes is vascular disease, which in severe cases can lead to amputation – a major cause of disability. Rates of major and minor diabetic amputation are higher locally than the England average (see Section 3.5). [12]

3.4.6 Socio-economic disadvantage

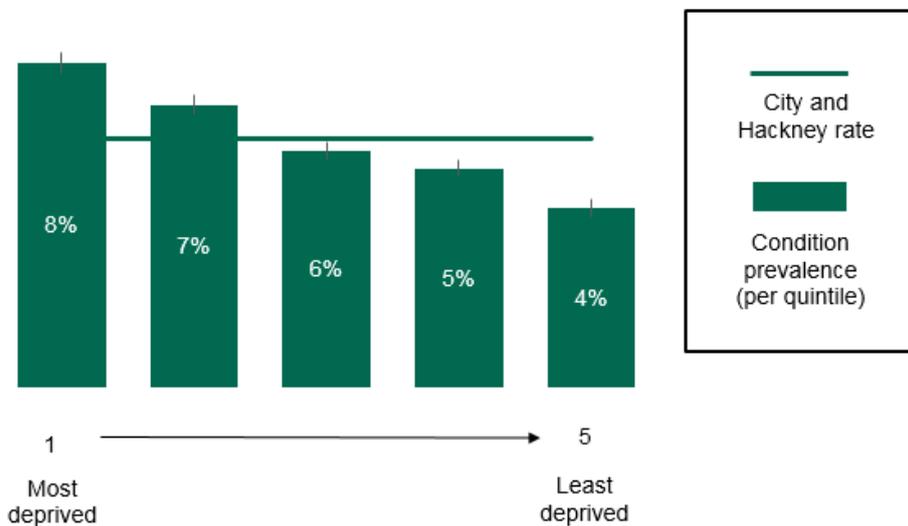
Figure 10 and Figure 11 show that there is a positive association between recorded prevalence of both 'pre-diabetes' and diabetes and local area deprivation. Prevalence is highest in the most deprived neighbourhoods of Hackney and the City, and lowest in the least deprived (most affluent) neighbourhoods.

Figure 10: Percentage of adults in Hackney and the City with GP-recorded 'pre-diabetes' (18+, 2017)



Source: Extracted from the local GP register by CEG, Blizard Institute, April 2017. [10]
 Notes: Data cover residents of Hackney and the City registered with a GP in Hackney, the City of London, Tower Hamlets and Newham.
 Deprivation is defined using the Index of Multiple Deprivation 2015 (IMD). IMD is a measure of relative deprivation for small areas that combines 37 separate indicators, each reflecting a different aspect of deprivation experienced by individuals living in an area. Deprivation groupings are reported from 1 (most deprived) to 5 (least deprived).

Figure 11: Percentage of adults in Hackney and the City with GP-recorded diabetes (type 1 and type 2) (18+, 2017)



Source: Extracted from the local GP register by CEG, Blizard Institute, April 2017. [10]
 Notes: Data cover residents of Hackney and the City registered with a GP in Hackney, the City of London, Tower Hamlets and Newham.
 Deprivation is defined using the Index of Multiple Deprivation 2015 (IMD). IMD is a measure of relative deprivation for small areas that combines 37 separate indicators, each reflecting a different aspect of deprivation experienced by individuals living in an area [13]

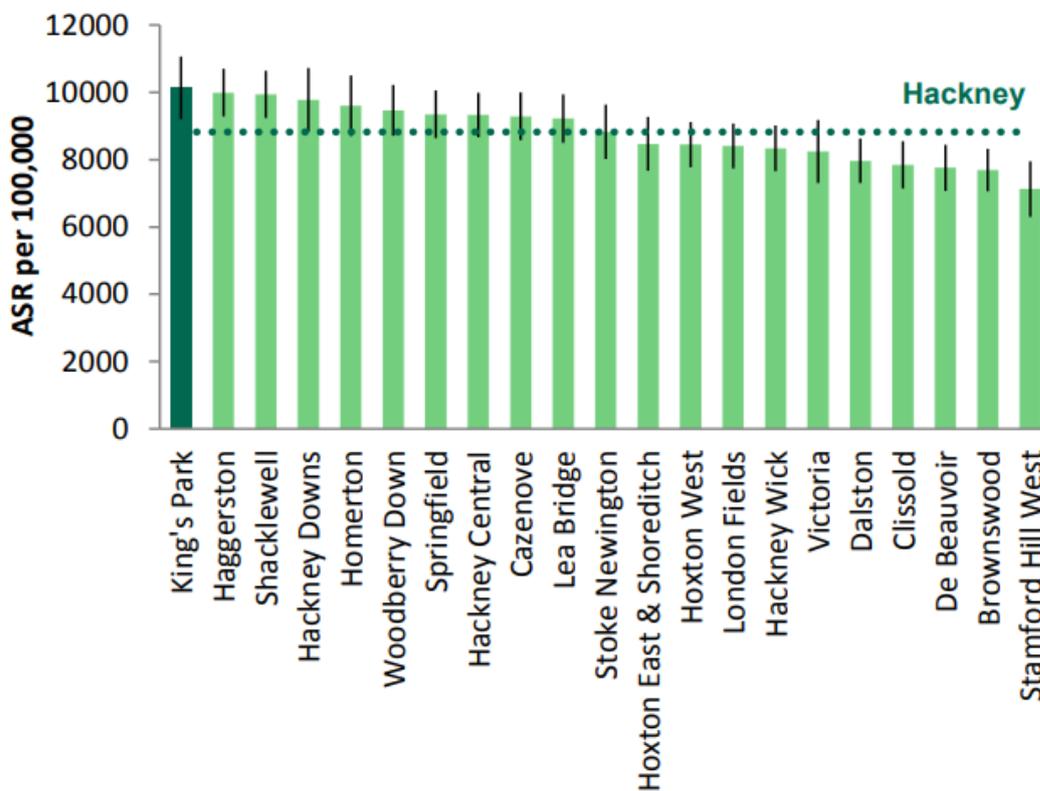
3.4.7 Location within Hackney and the City

Hackney health and wellbeing ward profiles describe indicators of health for each ward within the borough. Based on 2015 data, King’s Park ward in the south east of Hackney has the highest recorded prevalence of diabetes in the borough, and Stamford Hill West has the lowest (

Figure 12). [14]

Ward level data are not available for the City of London at this point in time.

Figure 12: Age-standardised rate of GP-recorded diabetes by Hackney ward (all ages, 2015)



Source: Hackney ward profiles [14]
 Note: Based on GP patient residential address.

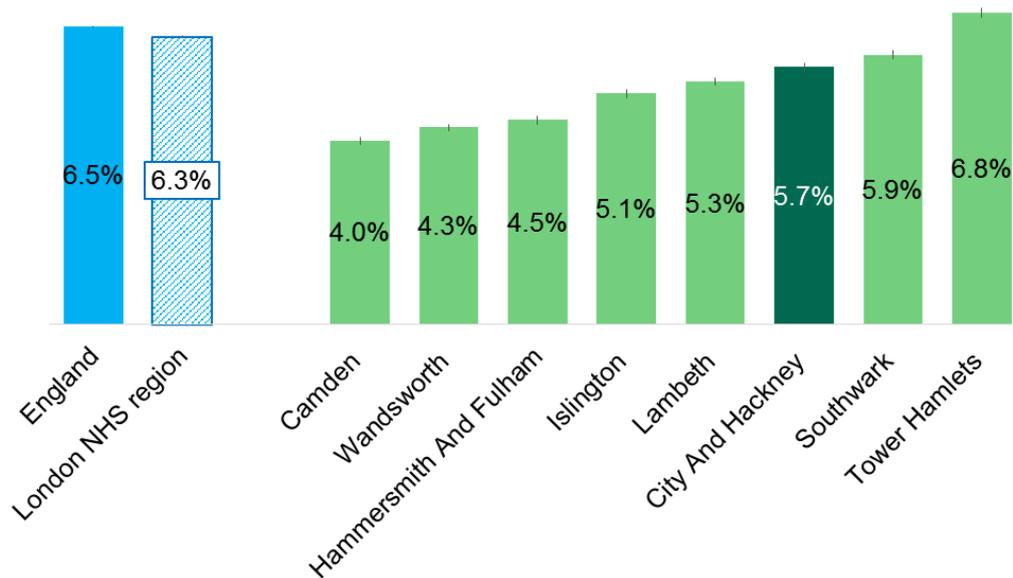
3.5 Comparisons with other areas and over time

Data presented here draw on PHE’s diabetes public health profile – a free, online tool that allows users to compare local and national figures on a number of different indicators relating to diabetes. [15] Please note that these data are from a different source to the local GP data reported so far.

3.5.1 Prevalence

The overall recorded prevalence of diabetes in Hackney and the City patients is at the higher end of Hackney’s statistical peers, but is lower than the London and England averages (Figure 13).²

Figure 13: Quality and Outcomes Framework (QOF) recorded prevalence of diabetes in GP patients (17+, 2015/16)



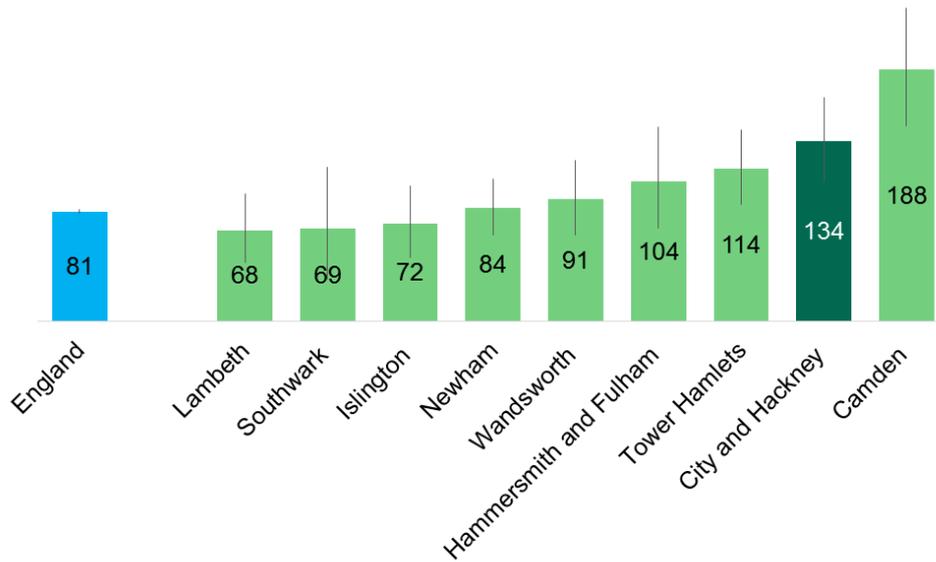
Source: PHE Fingertips [7]

3.5.2 Complications of diabetes

As described in section 3.1, people with diabetes have a higher risk of experiencing certain CVD conditions than people who do not have diabetes. Figure 14 shows that the additional risk of stroke in Hackney and the City patients with diabetes is higher than the England average.

² This data is taken from PHE Fingertips, which uses Quality and Outcomes Framework (QOF) recorded prevalence of diabetes from practice disease registers in 2016/17. This is a different source of data to that presented in Sections 3.3.1 and 3.4.

Figure 14: Additional risk of stroke in people with diabetes (all ages, 2010–13)

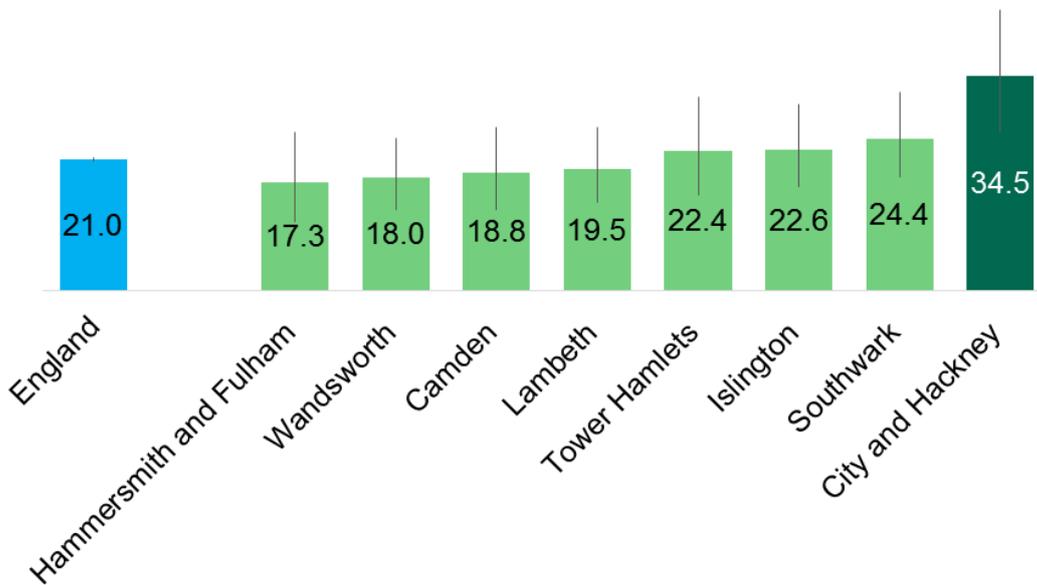


Source: PHE Fingertips [7]

Note: Standardised ratio of the risk of stroke in people with diabetes (in a three-year time period) compared to the risk of stroke in people without diabetes.

The rate of ‘major’ and ‘minor’ diabetic limb amputations locally is higher than the rate for England, and is at the upper end of the range of all Hackney’s statistical peers (Figure 15 and Figure 16). The rate of amputations appears to have been increasing locally in recent years (Figure 17 and Figure 18).

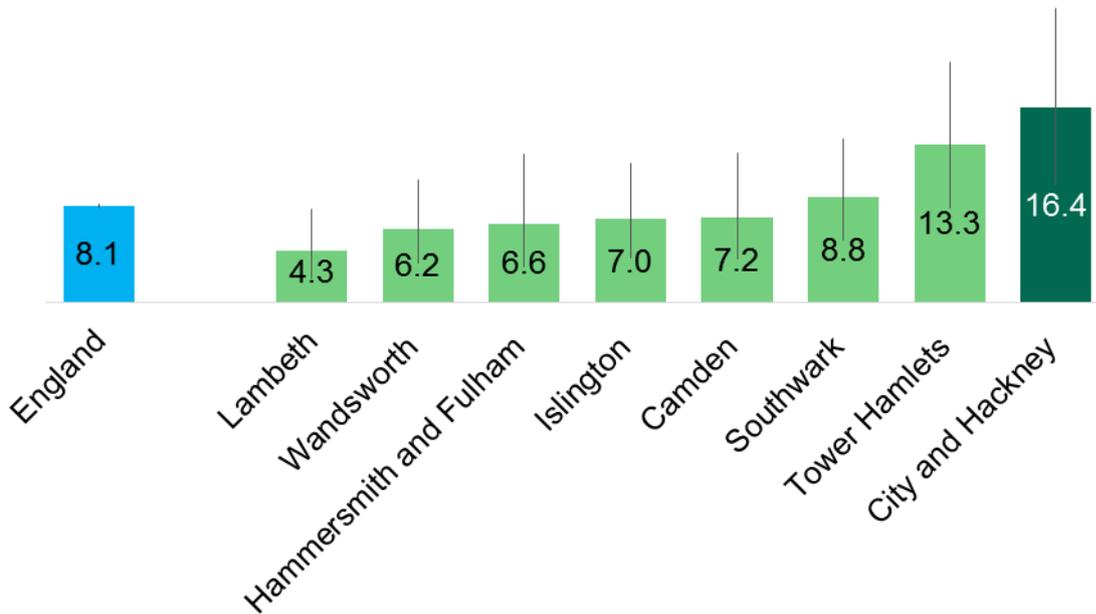
Figure 15: Standardised rate (per 10,000 registered diabetic patients) of minor diabetic lower-limb amputation procedures (all ages, 2013/14 – 2015/16)



Source: PHE Fingertips [7]

Note: Directly age and ethnicity standardised rate of minor diabetic lower-limb amputation procedures, by CCG of responsibility over a three-year period.

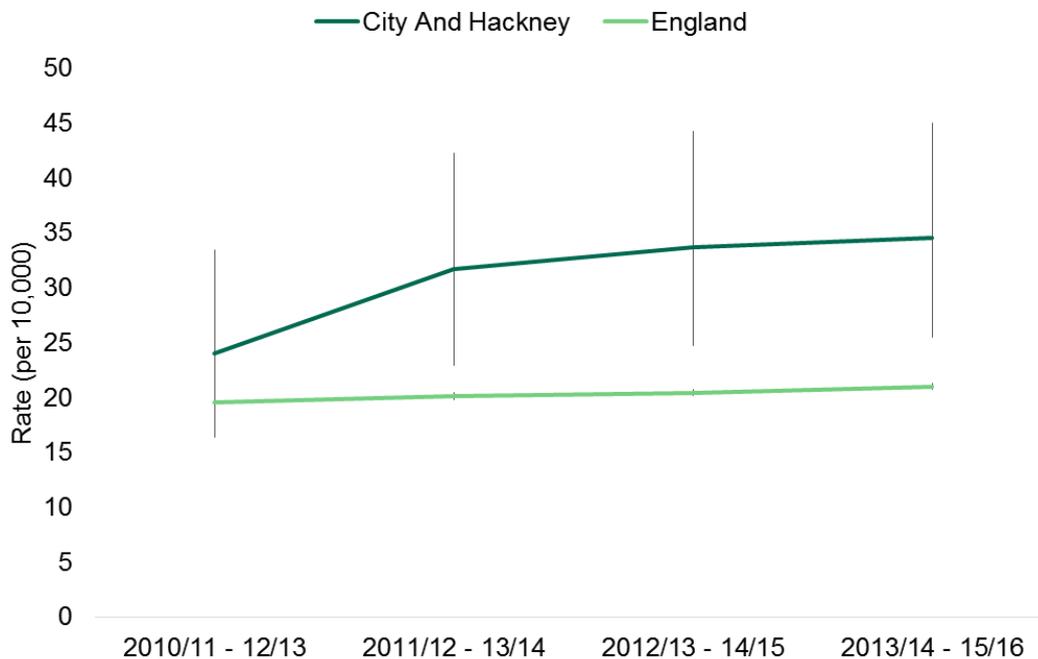
Figure 16: Standardised rate (per 10,000 registered diabetic patients) of major diabetic lower-limb amputation procedures (all ages, 2013/14 – 2015/16)



Source: PHE Fingertips [16]

Note: Directly age and ethnicity standardised rate of major diabetic lower-limb amputation procedures, by CCG of responsibility over a three-year period.

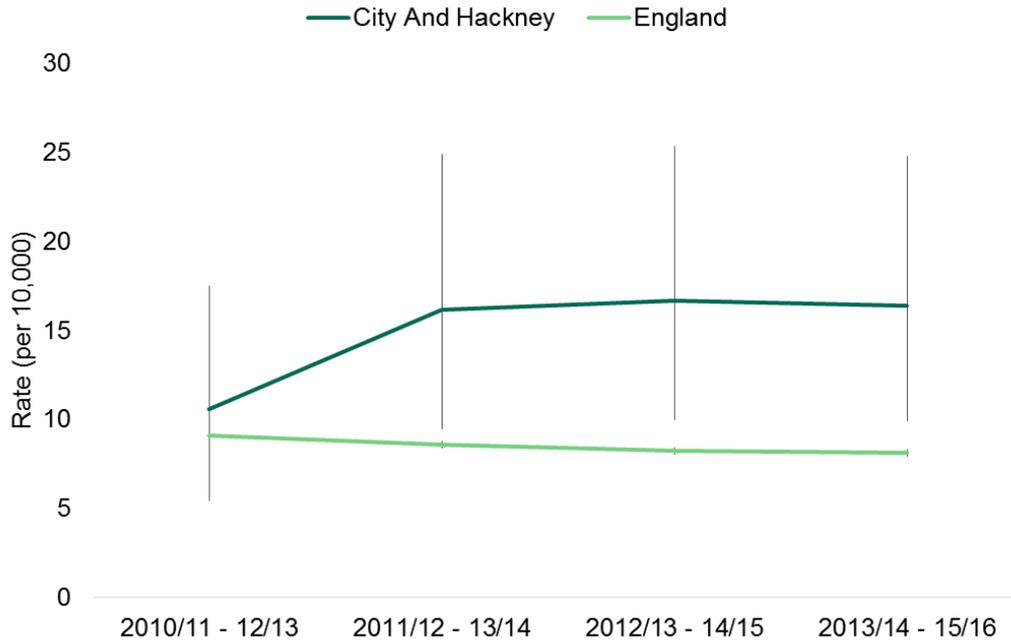
Figure 17: Standardised rate (per 10,000 registered diabetic patients) of minor diabetic lower-limb amputation procedures (all ages, 2010/11 – 2015/16)



Source: PHE Fingertips [7]

Note: Directly age and ethnicity standardised rate of minor diabetic lower-limb amputation procedures, by CCG of responsibility over a three-year period.

Figure 18: Standardised rate (per 10,000 registered diabetic patients) of major diabetic lower-limb amputation procedures (all ages, 2013/14 – 2015/16)



Source: PHE Fingertips [7]

Note: Directly age and ethnicity standardised rate of major diabetic lower-limb amputation procedures, by CCG of responsibility over a three-year period.

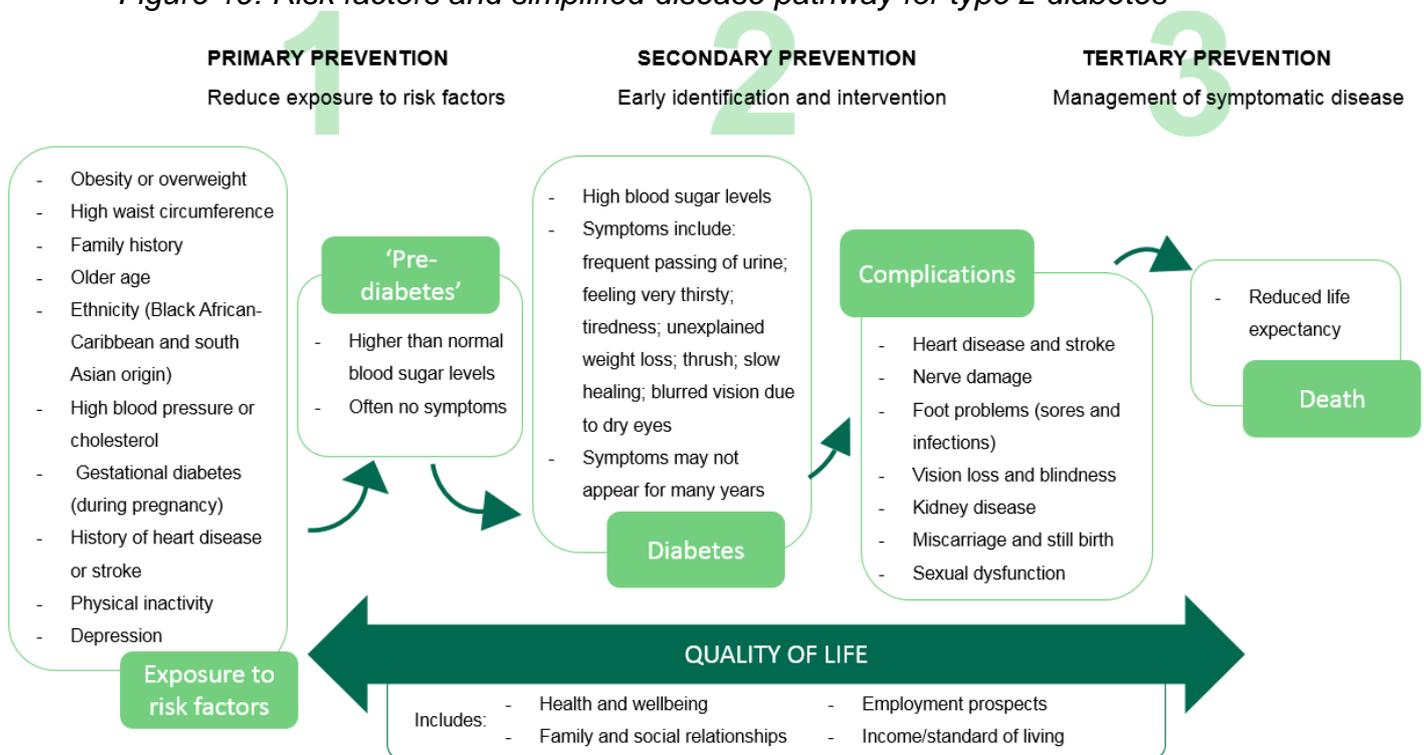
3.6 Evidence and good practice

Due to the large number of people affected, and the significant scope for prevention, the focus here is on evidence and good practice relating to the prevention, detection and management of type 2 diabetes.

Evidence-based guidelines on the diagnosis and management of type 1 diabetes and diabetes in pregnancy have been published by the National Institute for Health and Care Excellence (NICE) and are available through its website.³ [17] [8]

Figure 19 below presents a simplified overview of the disease pathway for type 2 diabetes, describing key risk factors and progress of the disease in the absence of any intervention.

Figure 19: Risk factors and simplified disease pathway for type 2 diabetes

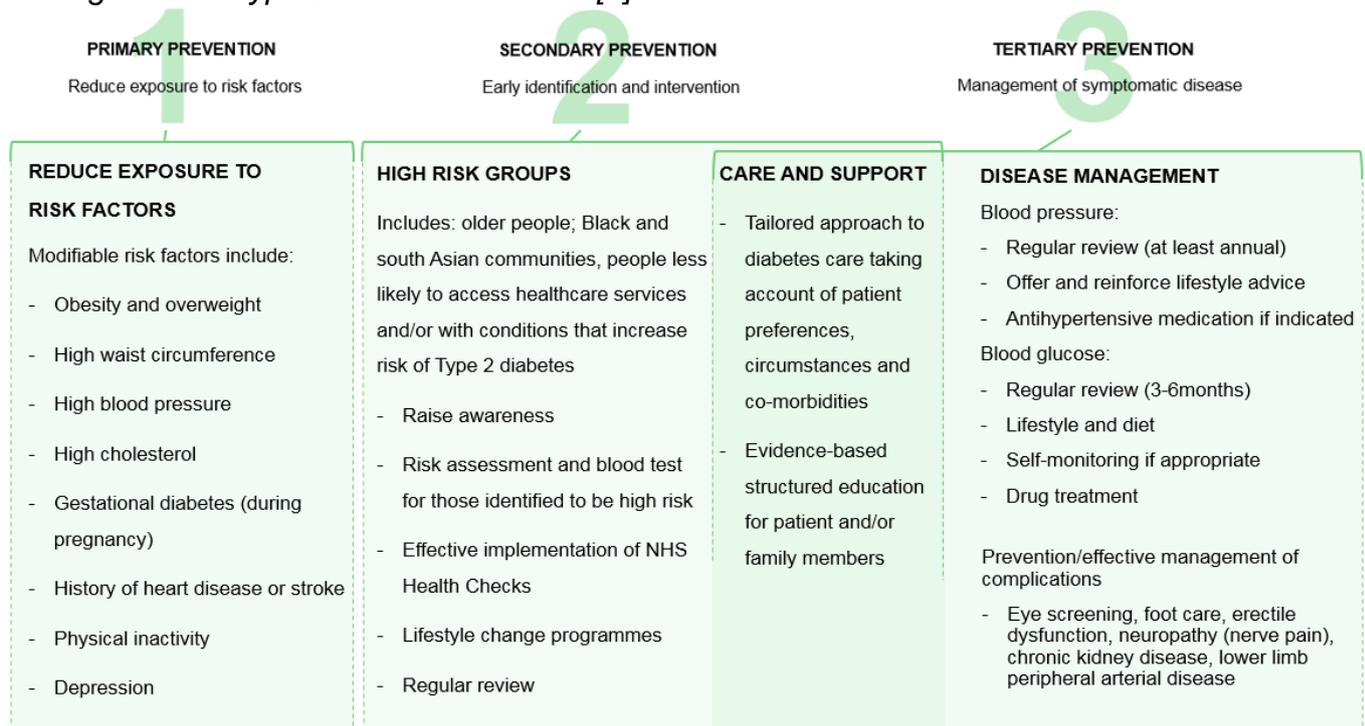


Source: City and Hackney Public Health Team (2017)

Figure 20 summarises relevant NICE guidance relating to the prevention, detection and management of type 2 diabetes. This is discussed in more detail below.

³ <https://www.nice.org.uk/guidance/conditions-and-diseases/diabetes-and-other-endocrinal-nutritional-and-metabolic-conditions/diabetes>

Figure 20: Overview of NICE guidance on the prevention, detection and management of type 2 diabetes in adults [8]



3.6.1 Prevention

PHE estimates that 30-60% of type 2 diabetes cases could be prevented through appropriate behaviour change support. [18]

NICE has published guidance on population and community level interventions for type 2 diabetes prevention. [19] The principles of an effective approach are: supporting behaviour change, achieving and maintaining a healthy weight, effective weight-loss programmes, physical activity, and cultural appropriateness. The guidance recommendations are described under the following headings.

- Integrating national strategy on non-communicable diseases
- Local joint strategic needs assessments
- Developing a local strategy
- Interventions for communities at high risk of type 2 diabetes
- Conveying messages to the whole population
- Conveying messages to local populations
- Promoting a healthy diet
- Promoting physical activity
- Training those involved in promoting healthy lifestyles.

NICE has also published a wealth of related guidance on lifestyle risk factors relevant to preventing type 2 diabetes, which is summarised in the ‘Lifestyle and behaviour’ chapter of the JSNA.

Evidence-based interventions to manage obesity, another major preventable risk factor for type 2 diabetes (linked to many of the lifestyle factors described above), are summarised in the relevant section of this chapter.

Research evidence on diabetes prevention programmes

There has been some debate in the literature on the impact of diabetes prevention programmes in 'real-world' settings. A systematic review and meta-analysis by PHE (published in 2015) assessed the effectiveness of 'real-world' interventions for the prevention of type 2 diabetes in high-risk populations. [6] The incidence of diabetes at 12-18 months follow-up was 26% lower among programme completers compared to those receiving 'usual care'. This review concluded that diabetes prevention programmes can significantly reduce the progression to type 2 diabetes and lead to reductions in weight and blood glucose measures. This study concluded that those developing diabetes prevention programmes should adhere to NICE guidelines to increase efficacy. Aspects of programmes associated with greater weight loss included:

- using a combined diet and physical activity intervention
- including a greater number of sessions (intensity)
- spreading sessions across 9-18 months (duration).

NHS Diabetes Prevention Programme

The research on what works for preventing diabetes contributed to the development of Healthier You: NHS Diabetes Prevention Programme (NHS DPP), which is underpinned by evidence-based principles. Healthier You offers interventions to influence diet and physical activity behaviours of people at high risk of developing type 2 diabetes (determined by blood glucose levels), largely in the form of group sessions of around 1-2 hours, delivered face-to-face for a minimum of nine months. Section 3.7 outlines how the programme is being delivered in Hackney and the City.

The NHS DPP is piloting a digital stream that offers similar support, assistance and guidance, but through the use of digital interventions, such as:

- wearable technologies that monitor levels of exercise
- apps that allow users to access health coaches
- online peer support groups
- the ability to set and monitor goals electronically.

Monitoring the results of this pilot will be vital for informing future decisions about which interventions might be most effective, and for which groups, in the prevention of diabetes among people at high risk of the disease.

3.6.2 Identification and early intervention

There is a lack of awareness of the signs, symptoms and risk factors of type 2 diabetes. A survey of Diabetes UK members diagnosed with type 2 diabetes in a 12-month period found only 18% were diagnosed as a result of a routine test offered by

their GP or practice nurse, and 37% were diagnosed as a result of having a test for another condition or problem. Over half (56%) were unaware of the symptoms of diabetes. [20]

In order to identify people with type 2 diabetes and those at high risk of developing the disease, NICE recommends encouraging people from the following groups to have a risk assessment using a validated tool (such as the Diabetes UK Know Your Risk assessment score):

- all non-pregnant adults aged 40 and above
- people aged 25-39 of South Asian and Chinese, African-Caribbean and Black African descent, and other high-risk minority ethnic groups
- people with conditions that increase the risk of type 2 diabetes (See Section 3.2 on those with 'pre-diabetes'). [4]

For those with a high risk score following assessment, a confirmatory blood test should be carried out (HbA1c or fasting plasma glucose).

PHE recommends that the NHS Health Check programme is used to identify those at high risk of developing type 2 diabetes. This programme targets people aged 40-74 years of age and involves an assessment of CVD risk, including diabetes. [21].

NICE has also produced guidance on managing diabetes and its complications in women who are planning pregnancy or already pregnant. Recommendations include action to improve the diagnosis of gestational diabetes, and help women with diabetes to self-manage their blood glucose levels before and during pregnancy. [8]

3.6.3 Treatment, care and support

For those living with diabetes, the risk of complications can be significantly reduced through adherence to relevant NICE quality standards (which also cover diabetes prevention – see Table 4) and the three treatment targets for HbA1c (glucose control), blood pressure and cholesterol (see Table 5).

Underpinning the quality standards, NICE provides guidance on the management of type 2 diabetes for adults. [22] The recommendations cover individualised care, patient education, dietary advice, blood pressure management, antiplatelet therapy, blood glucose management, and management of complications. People with diabetes are more likely to develop heart disease or have a stroke. Possible complications include diabetic retinopathy (when the retina, the light-sensitive layer of tissue at the back of the eye, becomes damaged), and nerve damage. Damage to the nerves of the foot can mean small nicks and cuts are not noticed and this, in combination with poor circulation, can lead to a foot ulcer. Consequently, eye screening, diabetic foot services and vascular services are all vital interventions as part of the package of care for people with diabetes.

In addition, PHE recommends that: [18]

- all GP practices should take part in the National Diabetes Audit (NDA), and their results should be benchmarked and variations explored

- patient education and shared management should receive increased support from local organisations.

A recent systematic review of diabetes self-management education found good evidence that this can lead to statistically significant decreases in HbA1c levels. [23]

Table 4: Diabetes in adults, NICE quality standard (QS6) [24]

Quality statement	Statement content
Statement 1	Adults at high risk of type 2 diabetes are offered a referral to an intensive lifestyle-change programme
Statement 2	Adults with type 2 diabetes are offered a structured education programme at diagnosis
Statement 3	Adults with type 1 diabetes are offered a structured education programme 6-12 months after diagnosis
Statement 4	Adults with type 2 diabetes whose HbA1c level is 58 mmol/mol (7.5%) or above after six months with single-drug treatment are offered dual therapy
Statement 5	Adults at moderate or high risk of developing a diabetic foot problem are referred to the foot protection service
Statement 6	Adults with a limb-threatening or life-threatening diabetic foot problem are referred immediately for specialist assessment and treatment
Statement 7	Adults with type 1 diabetes in hospital receive advice from a multi-disciplinary team with expertise in diabetes.

Table 5: Type 2 diabetes treatment targets [25]

Target	Level	Rationale
HbA1c	≤ 58 mmol/mol	Reduces the risk of all diabetic complications
Blood pressure	≤140/80 ⁴	Reduces the risk of vascular complications and reduces the progression of eye disease and kidney failure
Total cholesterol	< 5mmol/L	Reduces the risk of vascular complications

For patients with diabetes who are obese, bariatric surgery may be an effective treatment intervention. Bariatric surgery is a procedure to enable weight loss that NICE recommends as a treatment option for people with severe obesity, provided they meet certain criteria. [26] The NICE quality standard on obesity clinical assessment and management includes a quality statement recommending expedited referral for bariatric surgery assessment for adults with BMI 35+ diagnosed with type 2 diabetes in the last 10 years. [26]

In a 2017 study, bariatric surgery was associated with reduced odds of developing diabetes and increased odds of remission in people with diabetes. Surgery was more cost effective (compared to 'usual care') for very obese people who had diabetes than for those without diabetes. [27]

3.7 Services and support available locally

3.7.1 Prevention

The 'Society and environment' and 'Lifestyle and behaviour' chapters of the JSNA describe how Hackney Council and the City of London Corporation are working to change the wider environment to promote positive dietary behaviours and physical activity. This includes interventions to make healthier eating easier (such as limiting the spread of fast food takeaways through town planning restrictions) and to facilitate active travel (through changes to the street infrastructure to promote walking and cycling). This approach recognises the influence of the wider environment on people's behaviour.

Hackney and the City also support a range of individual and group-based interventions for adults (including older adults) relating to improving diet and increasing physical activity. These operate in community halls, leisure centres and other spaces, often targeting groups at highest risk of diabetes. More detail on these services is provided in the 'Lifestyle and behaviour' chapter.

3.7.2 Identification and early intervention

There are a range of local referral-based 'lifestyle' services relevant to identification and early intervention of diabetes in high-risk groups, including integrated weight management and exercise on referral programmes (see 'Lifestyle and behaviour' chapter for detail). In addition, the following are available to eligible local residents.

- Local delivery of the NHS Health Check programme (delivered by the City & Hackney GP Confederation) provides a vehicle for systematically assessing diabetes risk in adults aged 40 to 74, and providing advice and support to help reduce that risk (e.g. through referral to local lifestyle services). Those identified to be at risk of diabetes, either through the NHS Health Check programme or otherwise, are reviewed annually by their GP. In 2016/17, 542 people received an NHS Health Check in the City of London and 8,959 people received an NHS Health Check in Hackney.
- City and Hackney Clinical Commissioning Group (CCG) commissions the City & Hackney GP Confederation to improve support for people with diabetes, or at high risk of developing it, through the long-term conditions (LTC) contract. This contract incentivises GP practices to deliver a range of activity, including case-finding, annual reviews, referrals and treatment targets for people at risk of diabetes. These incentives are over and above those provided through the national Quality and Outcomes Framework).⁵ Each practice is given an individual referral target for the national NHS Diabetes Prevention Programme (NDPP) as part of the overall contract.

⁵ The Quality and Outcomes Framework (QOF) is the annual reward and incentive programme to promote GP practice achievement of results in particular areas. It was introduced as part of the GP contract in 2004.

- The NHS Diabetes Prevention Programme (NDPP) has been running in Hackney and the City since 2016. Eligible people are referred by their GP. Those referred receive tailored, personalised help to reduce their risk of type 2 diabetes. The programme involves 18 group sessions over a 40-week period, hosted in local community venues and focused on understanding health risks, nutrition guidance, behaviour change and physical activity support. Participants may be eligible for subsequent fixed-term membership of commercial weight loss programmes or leisure centres to support maintenance of healthier eating or increased physical activity. Hackney and the City were part of the East London first wave site for the NDPP.
- X-PERT Prevention of Diabetes (X-POD) courses are designed to be an engaging way for people at increased risk of developing type 2 diabetes to improve their understanding of the condition and support them to manage their own health in order to reduce this risk. X-POD courses are offered as part of the structured education programme run by Homerton Hospital. Current capacity is 100 places per year and uptake is around 60 places per year.

Data from the latest National Diabetes Audit (NDA) show that Hackney and the City need to improve in terms of uptake of structured education for newly diagnosed (type 1 and type 2) diabetes patients. Local analysis has identified that this is at least in part due to data recording issues. An improvement plan is in place to address these issues.

3.7.3 Treatment, care and support

Improved management of diabetes in primary care is incentivised through the LTC contract commissioned by the CCG (as described in Section 3.7.2). Treatment outcomes are measured against the NDA, the CCG Improvement and Assessment Framework (IAF),⁶ and amputation data.

All GP practices in Hackney and the City participated in the 2015/16 NDA, which is a significantly higher participation rate than the England average of 81.4%.

Hackney and the City perform well in terms of primary care control of blood sugar, blood pressure and cholesterol in diabetic patients when these targets are assessed separately. [12] However, when taking all three treatment targets together for patients with non-type 1 diabetes (the 'triple target' measure), the most recent NDA assesses Hackney and the City as 'needing improvement' – 37.7% of patients achieved all three treatment targets in 2015/16, compared with 40.4% on average across England. [28]

Homerton Hospital delivers a nurse-led integrated diabetes service, and a secondary care-based consultant-led service. These aim to:

- provide high-quality, timely interventions for people with diabetes to improve clinical outcomes and help them manage their condition effectively

⁶ The IAF is a national assurance framework for CCGs. For more detail, visit <https://www.england.nhs.uk/commissioning/ccg-assess/>.

- empower patients to manage their diabetes and participate fully in decisions about their care
- provide those at risk of diabetes with tools to reduce their risk and feel more in control of their health
- educate patients and their carers, as well as professionals, about effective diabetes management.

Service delivery comprises clinics in GP practices and in secondary care (including a joint antenatal and diabetes clinic, and specialist diabetes foot clinics), as well as structured group education programmes for diabetes patients to support them in effective self-management.

Homerton Hospital also runs a weekly obstetric medicine clinic where pregnant women with diabetes are seen by an obstetrician, endocrinologist and a diabetes specialist nurse. There is also a regular group session for pregnant women newly diagnosed with diabetes.

Retinal screening is commissioned by NHS England and is offered locally in an outpatient setting by Homerton Hospital.

Patients requiring emergency foot care are able to attend a drop-in clinic run by the podiatry department at Homerton Hospital. A higher percentage of patients from Hackney and the City receive an annual foot check (95% of people diagnosed with diabetes) than the London or England average.

Patients requiring urgent (or routine) vascular opinion are referred to the vascular team at Barts Health NHS Trust.

As described in Section 3.5, since 2011/12 the rates of lower limb amputations among people with diabetes in Hackney and the City have been higher than in comparable areas. Work is ongoing to identify the reasons for this, so that appropriate interventions can be put in place to improve performance in this area.

There is currently no support available locally for obese adults who require specialised management via a Tier 3 service, including those with type 2 diabetes. However, at the time of writing, a multi-disciplinary review of the local complex obesity pathway is underway. Bariatric surgery is provided by Homerton Hospital, with commissioning responsibility recently transferring from NHS England to the CCG. Around 50 patients per year from Hackney and the City undergo bariatric surgery at Homerton Hospital.

3.8 Service gaps and opportunities

The new Hackney and the City integrated commissioning system offers an exciting opportunity to bring a fresh, much more joined-up approach to the prevention, detection and management of diabetes risk and disease. A key focus of the new system is to shift activity and resources towards prevention, and the redesign of health and care services to support people to better manage their own health and keep them out of hospital.

As a significant cause of poor health and disability in Hackney and the City, diabetes prevention is a major priority within this programme of work. Learning from the NDPP, including the digital pilot, will help to shape the local response to diabetes prevention. Action is already being taken to improve local performance in a number of areas relevant to effective management of diabetes, including support for better self-management.

3.9 References

- [1] J. Newton, "Changes in health in England, with analysis by English regions and areas of deprivation, 1990-2013. A systematic analysis of the Global Burden of Disease Study 2013.," 2015. [Online]. Available: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/460510/15TL1323Changes_in_health_in_England_global_burden_disease_2013.pdf. [Accessed 1 Dec 2017].
- [2] NHS, "NHS Choices," NHS, 27 June 2016. [Online]. Available: <https://www.nhs.uk/conditions/type-2-diabetes/diagnosis/>. [Accessed 18 Jan 2018].
- [3] Diabetes.co.uk, "Gestational diabetes," Diabetes.co.uk, 2017. [Online]. Available: <http://www.diabetes.co.uk/gestational-diabetes.html>. [Accessed 1 Dec 2017].
- [4] National Institute for Health and Care Excellence, "PH 38 Type 2 diabetes: prevention in people at high risk," 2012.
- [5] Public Health England, "NHS Diabetes Prevention Programme Non-diabetic hyperglycemia," 2015.
- [6] Public Health England, "A systematic review and meta-analysis assessing the effectiveness of pragmatic lifestyle interventions for the prevention of type 2 diabetes in routine practice," 2015.
- [7] Public Health England, "PHE Fingertips," 2016. [Online]. Available: <https://fingertips.phe.org.uk/profile/diabetes-ft>. [Accessed 24 Nov 2017].
- [8] National Institute for Health and Care Excellence, "Diabetes in pregnancy: management from preconception to the postnatal period," NICE, 2015.
- [9] Diabetes UK, "Type 2 Diabetes Risk Factors," Diabetes UK, [Online]. Available: <https://www.diabetes.org.uk/preventing-type-2-diabetes/diabetes-risk-factors>. [Accessed 18 Jan 2018].
- [10] Clinical Effectiveness Group (CEG), *Bespoke data extract*, London: CEG, 2017.
- [11] City and Hackney Public Health Team, "Lifestyle and Behaviour: Physical activity and inactivity," 2016.
- [12] Public Health England, "PHE Fingertips - Diabetes," [Online]. Available: <https://fingertips.phe.org.uk/profile/diabetes-ft>. [Accessed February 2017].
- [13] Ministry of Housing, Communities and Local Government, "English indices of deprivation 2015," Ministry of Housing, Communities and Local Government, 2015. [Online]. Available:

- <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015>. [Accessed Nov 2017].
- [14] City and Hackney Public Health Team, "Hackney Ward Profiles," 2015. [Online]. Available: <https://www.hackney.gov.uk/jsna>. [Accessed 20 Nov 2017].
- [15] PHE Fingertips, "Cardiovascular disease profiles," PHE, 2017.
- [16] PHE Fingertips, "Cardiovascular disease profile - Cardiovascular risk factors," 2016.
- [17] National Institute for Health and Care Excellence, "NICE Guidance NG 17. Type 1 diabetes in adults: diagnosis and management," 2015.
- [18] Public Health England, "CVD: Primary Care Intelligence Packs. CCG: NHS City and Hackney CCG," PHE, May 2016.
- [19] National Institute for Health and Care Excellence, "Public health guideline 35: Type 2 diabetes prevention: population and community-level interventions," 2011.
- [20] Diabetes UK, "Position Statement: Early identification of people with, and at high risk of Type 2 diabetes and interventions for those at high risk," 2015.
- [21] NHS, "Health Checks - guidance for commissioners. https://www.healthcheck.nhs.uk/commissioners_and_providers/guidance/national_guidance1/".
- [22] National Institute for Health and Care Excellence, "NICE Guideline NG28 Type 2 diabetes in adults: management," 2015 (updated 2017).
- [23] C. Chrvala, "Diabetes self-management education for adults with type 2 diabetes mellitus: A systematic review of the effect on glycemic control," *Patient Education and Counselling*, vol. 99, no. 6, 2016.
- [24] National Institute for Health and Care Excellence, "Diabetes in adults. Quality Standard (QS6)," NICE, Published March 2011, last updated August 2016.
- [25] NHS Digital, "National Diabetes Audit," [Online]. Available: <http://content.digital.nhs.uk/nda>.
- [26] National Institute for Health and Care Excellence, "NICE Quality Standard. Obesity: clinical assessment and management," 2016.
- [27] M. Gulliford, "Costs and outcomes of increasing access to bariatric surgery: cohort study and cost-effectiveness analysis using electronic health records," *Value in Health*, vol. 20, 2017.
- [28] NHS Digital, "National Diabetes Audit 2015/16," [Online]. Available: <http://content.digital.nhs.uk/searchcatalogue?productid=24328&q=%22National+diabetes+audit%22&sort=Relevance&size=10&page=1#top>. [Accessed April 2017].
- [29] NHS Digital, "Antenatal assessments within 13 weeks (CCGOIS 1.13)," December 2015. [Online]. Available: <https://data.gov.uk/dataset/antenatal-assessments-within-13-weeks-ccgois-1-13>. [Accessed 10 November 2016].
- [30] ICD10data.com, "ICD10data.com," [Online]. Available: <http://www.icd10data.com/ICD10CM/Codes>. [Accessed 29 Nov 2017].

- [31] Royal College of Physicians Sentinel Stroke National Audit Programme (SSNAP), "Clinical audit April - June 2015 public report. National results," RCP, London, 2015.
- [32] The emerging risk factors collaboration, "Diabetes mellitus, fasting blood glucose concentration, and risk of vascular disease: a collaborative meta-analysis of 102 prospective studies," *Lancet*, vol. 375, pp. 2215-22, 2010.
- [33] S. Peters, R. Huxley and M. Woodward, "Diabetes as a risk factor for stroke in women compared with men: a systematic review and meta-analysis of 64 cohorts, including 775 385 individuals and 12 539 strokes," *The Lancet*, vol. 383, no. 9933, pp. 1973-1980, 2014.
- [34] NHS England, "NHS Diabetes Prevention Programme (NHS DPP)," [Online]. Available: <https://www.england.nhs.uk/ourwork/qual-clin-lead/diabetes-prevention/>. [Accessed 22 September 2016].
- [35] Barry, "Efficacy and effectiveness of screen and treat policies in prevention of type 2 diabetes: systematic review and meta-analysis of screening tests and interventions," *BMJ*, 356, 2017.
- [36] Z. Aziz, "A systematic review of real world diabetes prevention programmes: learnings from the last 15 years," 2015.
- [37] Howells, "Clinical impact of lifestyle interventions for the prevention of diabetes: an overview of systematic reviews," *BMJ*, 2016.
- [38] Moody, "Social inequalities in prevalence of diagnosed and undiagnosed diabetes and impaired glucose regulation in participants in the Health Surveys for England series," *BMJ Open*, vol. 6, 2016.
- [39] National Institute for Health and Care Excellence, "NICE Adult Type 2 Diabetes Pathway and related guidance - <https://pathways.nice.org.uk/pathways/type-2-diabetes-in-adults>".