Non-Diabetic Hyperglycaemia, 2020-21 Diabetes Prevention Programme

England

01 Jan 2020 – 31 Mar 2021

14 July 2022

Contents

Acronym Key

BMI: Body Mass Index

CCG: Clinical Commissioning Group

DPP: Diabetes Prevention Programme

FPG: Fasting plasma glucose

HbA1c: Glycated haemoglobin

IMD: Index of multiple deprivation

NDH: Non-diabetic hyperglycaemia

T2DM: Type 2 diabetes mellitus

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Executive summary and recommendations

During the 2020-21 audit period healthcare services have been under increased pressure due to COVID-19. Despite the difficulties of the last year, GP practices have continued to diagnose and monitor people with non-diabetic hyperglycaemia (NDH), and to refer them onto a Diabetes Prevention Programme that swiftly pivoted to a remote service.

In the 2020-21 audit period…

- ❑ 440,260 people were newly diagnosed with NDH
- ❑ New diagnoses continued to be made amongst people of similar demographics to earlier years
- ❑ 39% of all people with NDH had glycaemic tests and BMI checks (56% in 2019-20)

More than 2 million people in England are currently diagnosed with non-diabetic hyperglycaemia, as GP practices continue to identify and record NDH diagnoses.

Recommendation 1

GP practices should continue to identify and appropriately record non-diabetic hyperglycaemia diagnoses in their clinical systems.

In 2017-18, 1.3 million people were known to be diagnosed with non-diabetic hyperglycaemia.

- ❑ In 2018-19, 5% had type 2 diabetes.
- ❑ In 2019-20, 10% had type 2 diabetes.

At the end of the 2020-21 audit period,

- ❑ 13% were diagnosed with type 2 diabetes,
- ❑ 76% still had NDH,
- ❑ 8% had died,
- ❑ 3% had an unknown outcome.

Executive summary and recommendations

Obesity and higher levels of HbA1c were associated with greater risks of progression to type 2 diabetes. This shows how key it is to affect lifestyle change through the Diabetes Prevention Programme (DPP). More than 1 million people with NDH had a glycaemic test result in 2020-21 which would make them potentially **eligible to the DPP**, including 85% of people diagnosed with NDH in 2020-21.

Recommendation 2

GP practices should appropriately offer to refer eligible people with non-diabetic hyperglycaemia to the Diabetes Prevention Programme to reduce their risk of developing type 2 diabetes.

To the end of March 2021, 663,020 people had been referred to the DPP, although only 408,065 had an NDH diagnosis in their GP record, and there remains significant geographical variation with as many as 4 out of 5 DPP referrals involving people with no GP record of a hyperglycaemia diagnosis, in some CCGs.

Although care process rates dipped overall under COVID-19 pressures - 67% of people with NDH had a glycaemic test, and 46% had body mass index (BMI) monitoring - the audit found noticeable variation in how well people were being monitored across demographic groups. People who were of black ethnicity, those aged under 40, and people who had been diagnosed with NDH more than 10 years ago were less likely to have had glycaemic tests or BMI checks, whilst people over 65 were most likely to have had care processes completed.

Recommendation 3

GP practices should conduct annual glycaemic tests (HbA1c, or fasting plasma glucose) and BMI checks for people with non-diabetic hyperglycaemia, endeavouring to provide these care processes across all groups.

Introduction: Non-diabetic hyperglycaemia

The NHS Diabetes Prevention Programme (NHS DPP) is a joint commitment from NHS England, Public Health England (now Office for Health Improvement and Disparities) and Diabetes UK to deliver, at scale, evidence based behavioural interventions that can prevent or delay the onset of type 2 diabetes in adults who have been identified as having non-diabetic hyperglycaemia.

This report primarily uses data from English GP practice systems for the period January 2020 to March 2021 inclusive, and data generated by providers of the Diabetes Prevention Programme relating to referrals up to March 2021 inclusive. The GP data is only for people diagnosed with non-diabetic hyperglycaemia.

Non-diabetic hyperglycaemia (NDH) refers to blood glucose levels that are above normal but not in the diabetic range. These are: HbA1c 42-47 mmol/mol or fasting plasma glucose (FPG) 5.5-6.9 mmol/l.

Status	HbA1c (mmol/mol)	FPG (mmol/L)
Normal	≤ 41	≤ 5.4
NDH	42 to 47	5.5 to 6.9
Type 2 diabetes	≥ 48	≥ 7.0

People with non-diabetic hyperglycaemia are at increased risk of developing type 2 diabetes. They are also at increased risk of cardiovascular conditions.

Table 1: Registrations and prevalence[1], GP-recorded non-diabetic hyperglycaemia (NDH) and type 2 diabetes, 2020-21, England

Registered at GP practice	Diagnosis of Type 2 diabetes recorded		Diagnosis of non-diabetic hyperglycaemia recorded	
	Number	Per cent	Number	Per cent
48,753,835	3,218,925	6.6%	2,378,485	4.9%

Source: NHS Digital

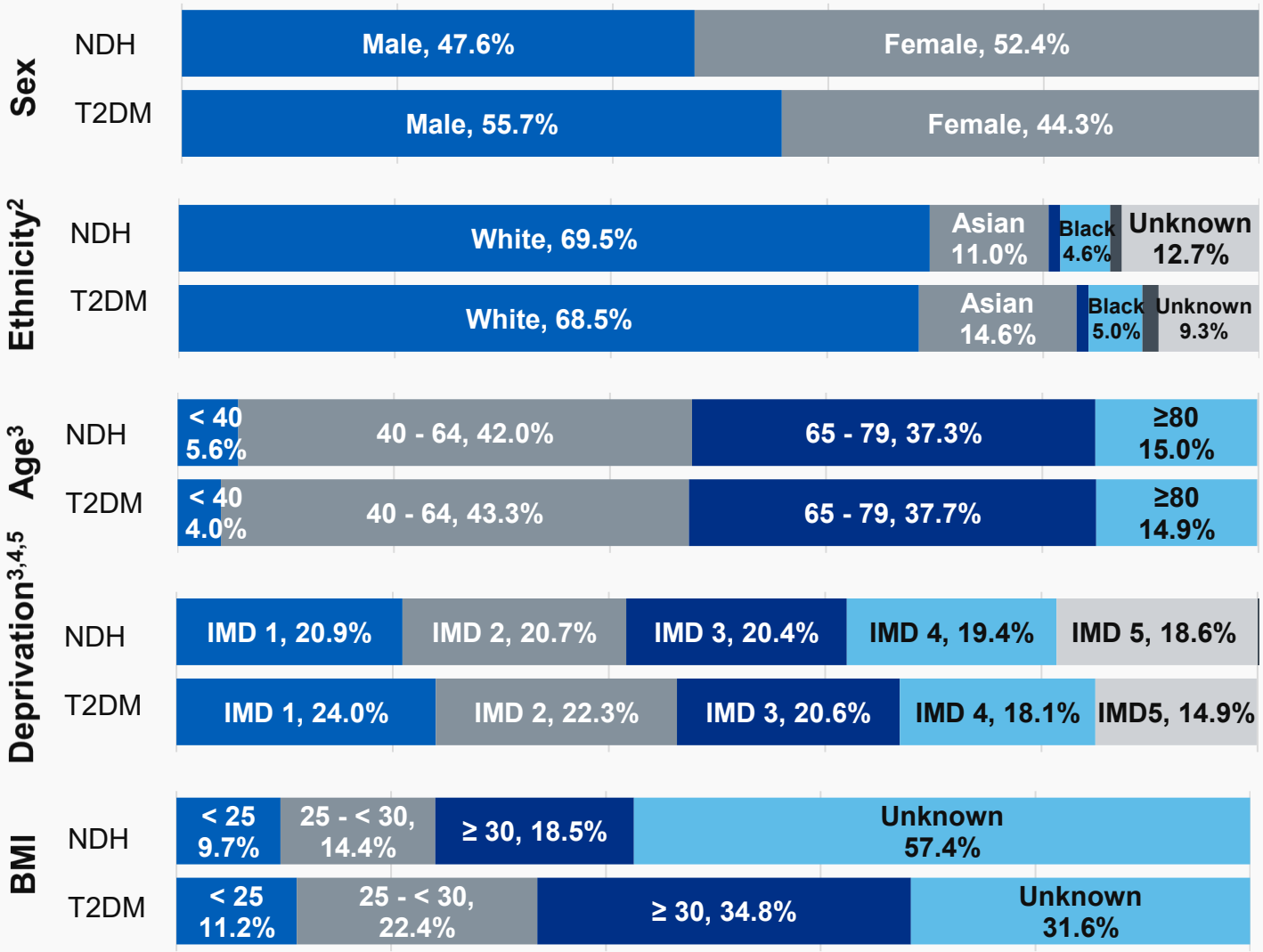
Notes:

1. People included: those registered at a GP practice that participated in NDA 2020-21.
2. Public Health England (2015): **Diabetes prevalence estimates for local populations** and **Analysis of non-diabetic hyperglycaemia prevalence in England**.

Public Health England estimated[2] that there are 4 million people with type 2 diabetes and 5 million people with non-diabetic hyperglycaemia in England.

Demographics: NDH and type 2 diabetes

Figure 1: Demographic breakdown[1], GP-recorded non-diabetic hyperglycaemia (NDH) and type 2 diabetes (T2DM), 2020-21, England



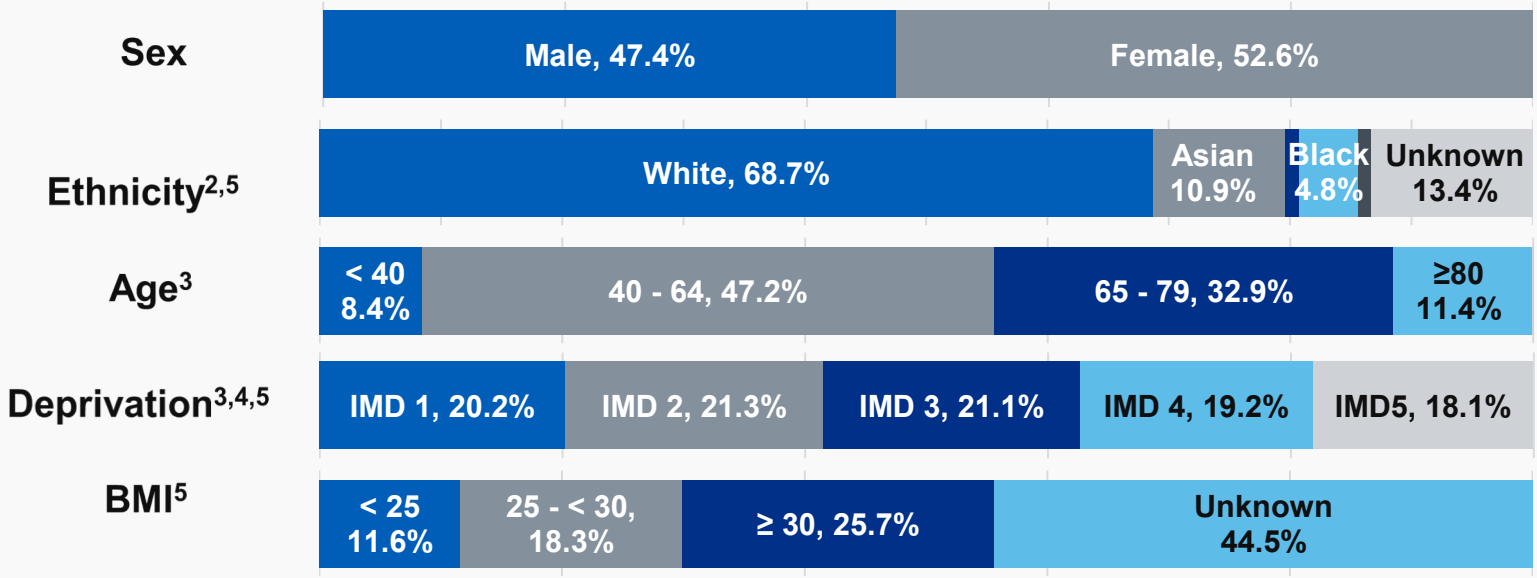
People with NDH have very similarly distributed demographics to people with type 2 diabetes; although a greater proportion of men, and people from more deprived areas, have been diagnosed with diabetes than NDH.

Notes:

1. People included: those registered at a GP practice that participated in NDA 2020-21.
2. The unlabelled ethnicity categories with very low volumes are **'Mixed'** and **'Other'**. Ethnicity is categorised using the 2011 census categories for ethnic group.
3. The low volume 'Unknown' categories have not been labelled for the age and deprivation characteristic breakdowns.
4. Index of multiple deprivation (IMD) used to assign levels of deprivation by person's home address where IMD 1 is for the most deprived and IMD 5 is for the least deprived areas.
5. Sum of individual percentages may not equal 100 due to rounding.

Demographics: New diagnoses of NDH

Figure 2: Demographic breakdown[1], GP-recorded non-diabetic hyperglycaemia (NDH), new diagnoses in 2020-21, England



Notes:

1. People included: those registered at a GP practice that participated in NDA 2020-21.
2. The unlabelled ethnicity categories with very low volumes are **'Mixed'** and **'Other'.** Ethnicity is categorised using the 2011 census categories for ethnic group.
3. The low volume 'Unknown' categories have not been labelled for the age and deprivation characteristic breakdowns.
4. Index of Multiple Deprivation (IMD) used to assign levels of deprivation by person's home address where IMD 1 is for the most deprived and IMD 5 is for least deprived areas.
5. Sum of individual percentages may not equal 100 due to rounding.

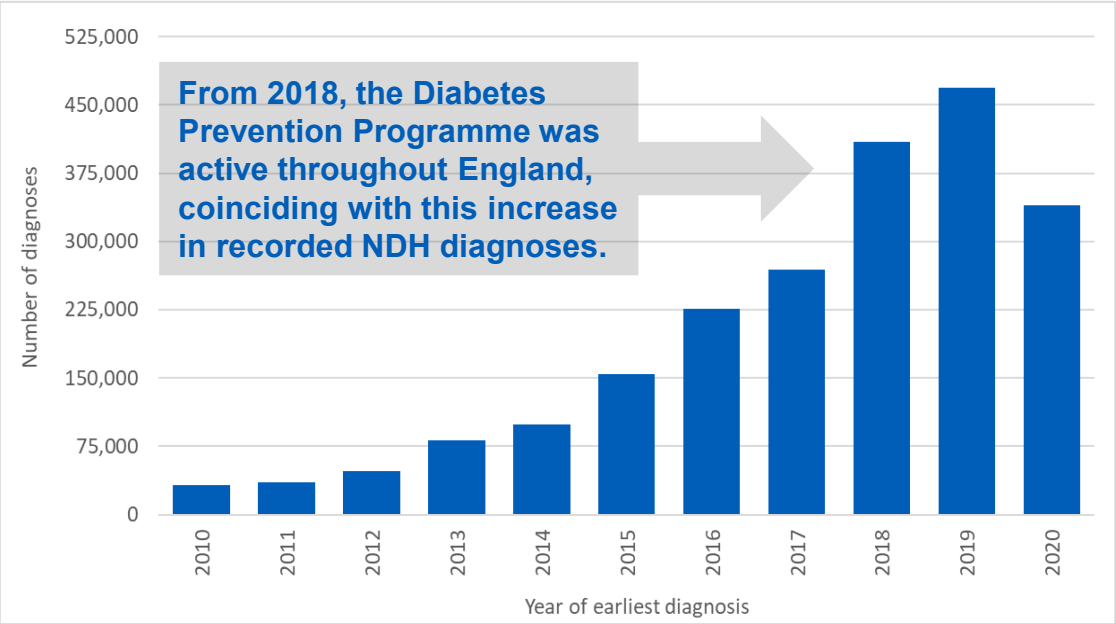
During 2020-21 healthcare services have been under increased strain as a result of the COVID-19 pandemic, and face-to-face GP appointments were limited.

Despite these restrictions people continued to be diagnosed with NDH, and those people who were first diagnosed in 2020-21 were similar in characteristics to those diagnosed with NDH in earlier years.

As might be expected, BMI measurements in 2020-21 were more often recorded in people with an NDH diagnosis in the current audit period.

Demographics: Year of NDH diagnosis

Figure 3: Registrations[1], by year of earliest diagnosis[2,3], GP-recorded non-diabetic hyperglycaemia (NDH), 2020-21, England



Year[4,5]	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Per cent	1.4	1.5	2.1	3.6	4.4	6.8	10.0	11.9	18.1	20.7	15.0	4.4

Recommendation 1

GP practices should continue to identify and appropriately record non-diabetic hyperglycaemia diagnoses in their clinical systems.

People continued to be diagnosed with non-diabetic hyperglycaemia in 2020 and 2021.

However, the impact of COVID-19 has meant that the increasing trend in diagnoses has stopped, with fewer people being diagnosed in 2020 than in 2018.

Notes:

1. People included: with a current diagnosis of NDH at the time of the 2020-21 collection, and registered at a GP practice participating in NDA 2020-21.

2. People may have multiple dates of diagnosis recorded, and may have experienced elevated levels of blood glucose for some time before they received a non-diabetic hyperglycaemia diagnosis.

3. Figure 3 only includes earliest diagnoses made before 2021

4. Low figures for year of diagnosis in 2021 due to incomplete year in the data .

5. In NDA 2020-21, 2,091,890 people with a current diagnosis of NDH had been first diagnosed from 2010 onwards.

Care processes: Glycaemic tests and BMI

'People at high risk of developing type 2 diabetes should be offered a blood test and assessment of their BMI at least once a year.'

NICE(PH38, recommendation 1.6.5): Type 2 diabetes: prevention in people at high risk

Recommendation 3

GP practices should conduct annual glycaemic tests (HbA1c, or fasting plasma glucose) and BMI checks for people with non-diabetic hyperglycaemia, endeavouring to provide these care processes across all groups.

In 2020-21, fewer people with NDH were monitored for BMI and glycaemic testing.

However, despite the pressures of the COVID-19 pandemic, more than two-thirds of people with non-diabetic hyperglycaemia had a HbA1c or fasting plasma glucose test.

Table 2: Patient monitoring within the audit period[1,2], GP-recorded non-diabetic hyperglycaemia (NDH), 2019-20 / 2020-21, England

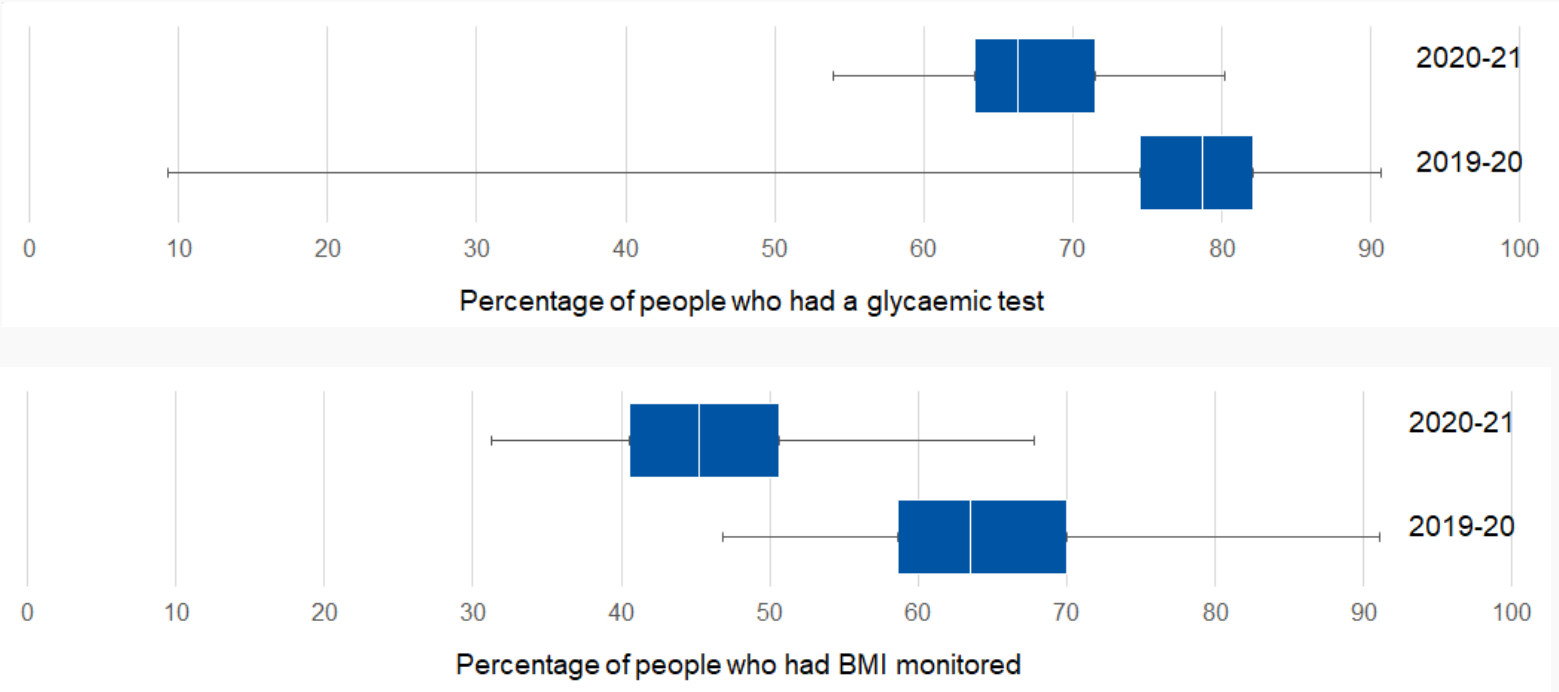
Care process	2019-20		2020-21	
	Number	Per cent	Number	Per cent
Any glycaemic test	1,670,925	78.1	1,597,930	67.2
- Fasting plasma glucose	101,425	4.7	65,305	2.7
- HbA1c	1,655,190	77.3	1,588,550	66.8
Body Mass Index	1,367,825	63.9	1,091,480	45.9
BMI and glycaemic test	1,199,455	56.0	925,280	38.9

Source: NHS Digital

Notes:
1. People included: those registered at a GP practice that participated in NDA 2019-20 / 2020-21.
2. 2,140,090 people were recorded with non-diabetic hyperglycaemia in NDA 2019-20.
2,378,485 people were recorded with non-diabetic hyperglycaemia in NDA 2020-21.

Care processes: Glycaemic tests and BMI

Figure 4: Patient monitoring within the audit period[1,2], by CCG, GP-recorded non-diabetic hyperglycaemia (NDH), 2019-20 - 2020-21, England



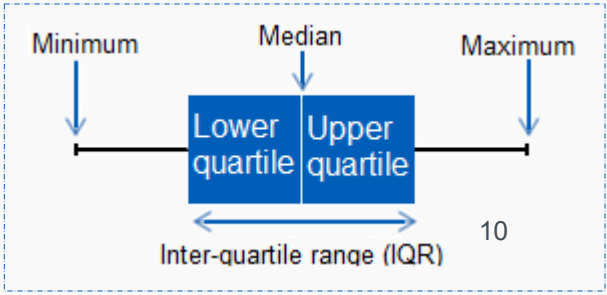
Notes:

1. People included: those registered at a GP practice that participated in NDA 2019-20 / 2020-21.

2. 2,140,090 people were recorded with non-diabetic hyperglycaemia in NDA 2019-20.
2,378,485 people were recorded with non-diabetic hyperglycaemia in NDA 2020-21.

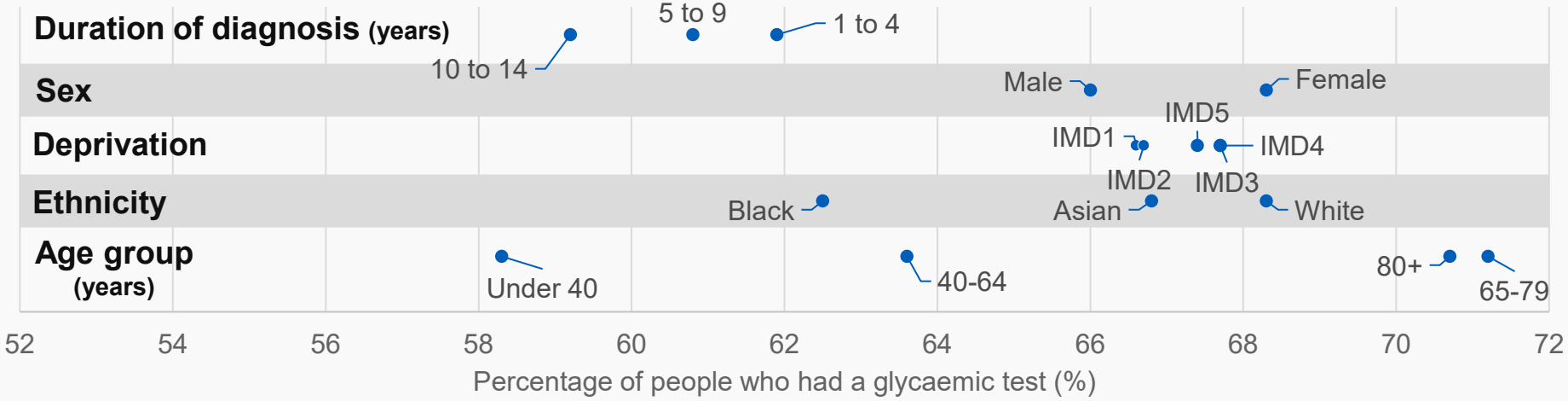
In 2019-20, the median level of glycaemic tests undertaken in CCGs was at 79%; in 2020-21 this was 66%.

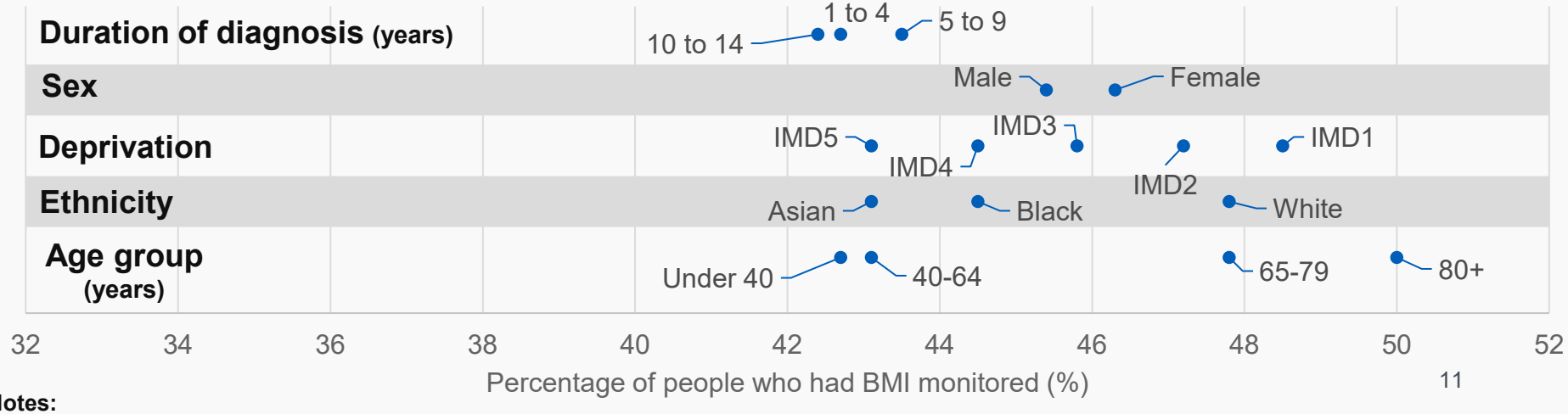
In 2019-20, the median level of BMI measurements undertaken in CCGs was at 64%; in 2020-21 this was 45%.



Care processes: Glycaemic tests and BMI

Figure 5: Patient monitoring within the audit period[1,2], GP-recorded non-diabetic hyperglycaemia (NDH), by demographic breakdown, 2020-21, England





Notes:

1. People included: those registered at a GP practice that participated in 2020-21. **2.** 2,378,485 people were recorded with non-diabetic hyperglycaemia in NDA 2020-21.

Care processes: Glycaemic tests and BMI

Table 3: Patient monitoring within the audit period[1,2], GP-recorded non-diabetic hyperglycaemia (NDH), by demographic breakdown, by diagnosis year, 2020-21, England

Care process	Glycaemic test (%)		Body Mass Index (%)	
Diagnosis year	2020-21	Other	2020-21	Other
All	**92.4**	**61.9**	**59.1**	**43.1**
Sex – Male	92.1	60.1	59.9	42.2
Sex – Female	92.5	62.7	58.6	43.5
Ethnicity – White	93.1	62.7	61.0	44.9
Ethnicity – Asian	91.2	61.3	57.5	39.8
Ethnicity – Black	89.4	56.2	59.6	41.0
Ethnicity – Mixed	90.3	57.0	58.6	40.5
Ethnicity – Other	90.3	59.7	62.0	43.2
Age – Under 40	89.8	46.0	58.4	36.6
Age – 40 to 64	91.8	56.2	59.1	39.0
Age – 65 to 79	93.6	66.9	59.8	45.5
Age – 80 +	92.8	67.1	59.0	48.6
Deprivation – IMD 1	93.5	60.7	62.6	45.4
Deprivation – IMD 2	91.3	60.9	59.8	44.3
Deprivation – IMD 3	91.8	62.0	58.3	42.8
Deprivation – IMD 4	92.6	62.1	57.9	41.5
Deprivation – IMD 5	92.4	61.9	57.2	40.0

8% of people diagnosed with NDH in 2020-21 did NOT have a glycaemic test done in the audit period.

People diagnosed with NDH in 2020-21 were more likely to have a BMI care process completed in the audit period – 59% – than people diagnosed earlier – 43%.

Overall, in 2020-21, people with NDH were more likely to have had their care processes if they were aged 65 and over.

There was relatively little difference in care processes across areas of different deprivation.

Notes:
1. People included: those registered at a GP practice that participated in 2020-21.
2. 2,378,485 people were recorded with non-diabetic hyperglycaemia in NDA 2020-21.

Progression to type 2 diabetes

Figure 6: Follow up[1] of NDH / diabetes status over previous audit periods, GP-recorded non-diabetic hyperglycaemia (NDH), 2017-18 - 2020-21, England

2017-18	1,294,495 people were recorded as having non-diabetic hyperglycaemia.				
Audit	Diabetes[2] (GP coded)	NDH (GP coded)	**NDH + glycaemia[5]**	Unknown[3]	Deceased[4]
2018-19	69,565 (5.4%)	1,168,465 (90.3%)	**815,605 of 1,168,465 (69.8%)**	25,680 (2.0%)	30,785 (2.4%)
2019-20	132,690 (10.3%)	1,068,055 (82.5%)	**736,285 of 1,068,055 (68.9%)**	29,650 (2.3%)	64,095 (5.0%)
2020-21	168,705 (13.0%)	987,840 (76.3%)	**582,435 of 987,840 (59.0%)**	33,505 (2.6%)	104,450 (8.1%)

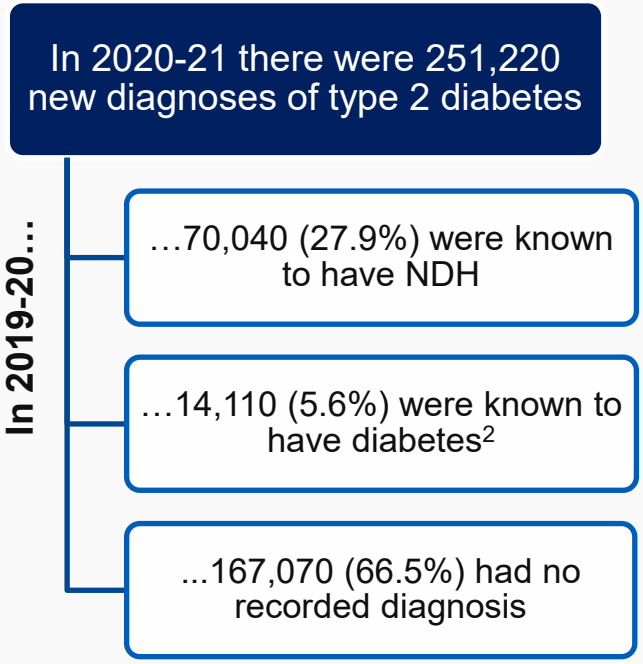
People may still be recorded with an NDH diagnosis, although their glycaemia may have moved outside of the NDH glycaemic range (HbA1c 42-47 mmol/mol or FPG 5.5-6.9 mmol/l).

70% of the 2017-18 cohort that were still diagnosed with NDH in 2018-19 had a glycaemic test result in the NDH glycaemic range, confirming they still had NDH in that year.

1. Includes all people diagnosed with NDH as recorded in the data taken for the 2017-18 DPP report.
2. Almost all subsequent diagnoses were of type 2 diabetes (2018-19: 99.6%, 2019-20:99.3%, 2020-21: 99.5%)
3. It is not known why people no longer have an NDH diagnosis recorded.
4. People who did not appear in the NDH or NDA collection for this audit period, and who are known to have died by the end of the same audit period.
5. People whose latest glycaemic test (HbA1c or fasting plasma glucose), was recorded in the audit period, and was in the non-diabetic hyperglycaemic range. .

Progression to type 2 diabetes

Figure 7: GP-recorded type 2 diabetes (T2DM), by NDH / diabetes[1] status in the last audit period, 2019-20 / 2020-21, England



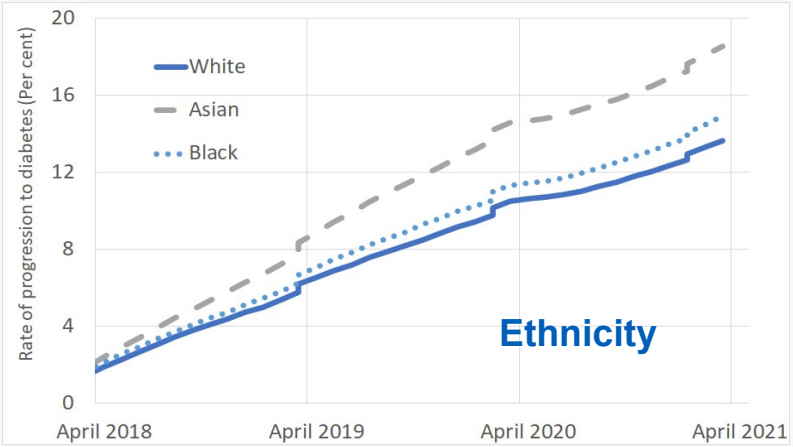
1. Includes people with diabetes, as recorded in the data taken for the 2020-21 NDA report, from GP practices in England, excluding those diagnosed with type 1 diabetes. **2.** NDA 2019-20 and NDA 2020-21 are 15 month audit periods. A person diagnosed with diabetes in Jan-Mar 2020 would be newly diagnosed in both the 2020-21 and 2019-20 collections.

8.1% of people in the 2017-18 audit are known to have died by the time of the 2020-21 NDH audit collection.

This could affect the progression-to-diabetes rate if people who otherwise might have developed diabetes have died.

People can be removed from the analysis at the time of their death, to find the diabetes progression rate over time amongst the living cohort.

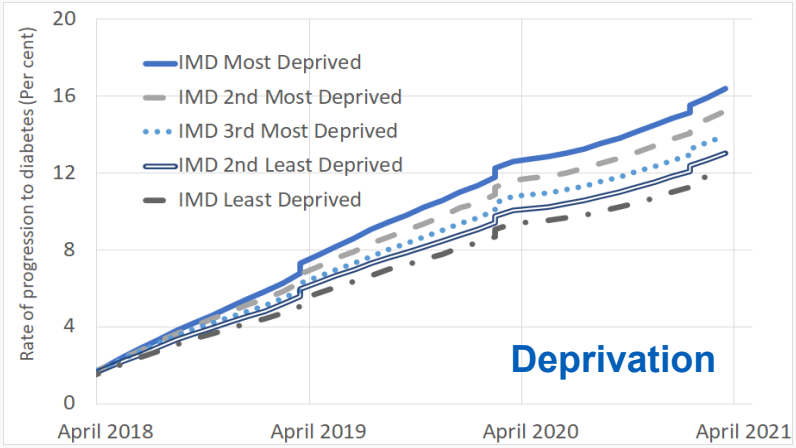
Figure 8: Rate of diabetes progression from NDH, by characteristic[1,2], GP-recorded non-diabetic hyperglycaemia (NDH), 2017-18 - 2020-21, England

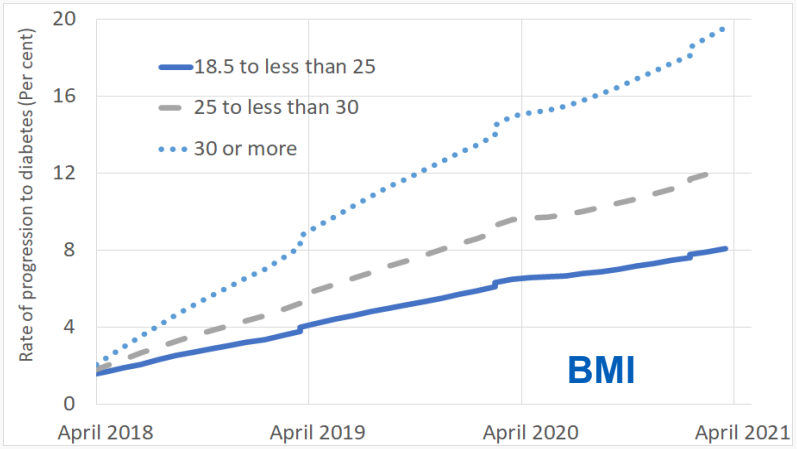


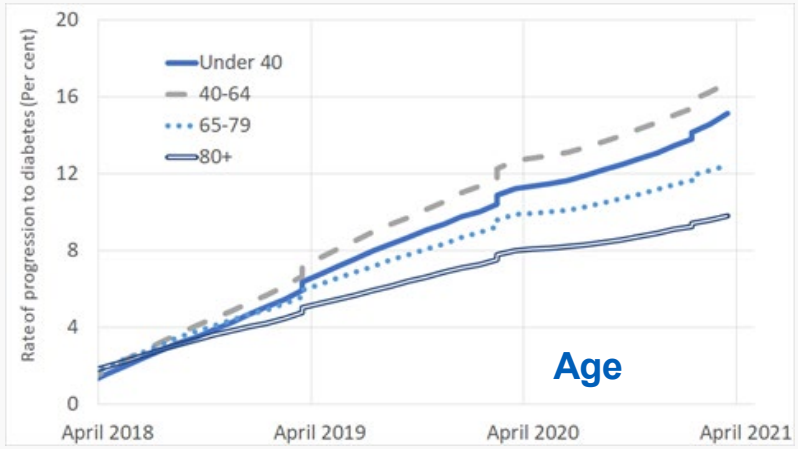
Notes:
1. Includes all people diagnosed with NDH as recorded in the data taken for the 2017-18 DPP report.
2. Breakdowns are univariate and do not consider any potential interactions between characteristics.

Progression to type 2 diabetes

Figure 8 (cont): Rate of diabetes progression from NDH, by characteristic[1,2,3], GP-recorded non-diabetic hyperglycaemia (NDH), 2017-18 - 2020-21, England







The risk of developing diabetes is highest in people aged 40 – 64 years, from the most deprived areas, of Asian ethnicity and those with an obese BMI.

Notes:

1. Includes all people diagnosed with NDH as recorded in the data taken for the 2017-18 DPP report.

2. Breakdowns are univariate and do not consider any potential interactions between characteristics.

3. Index of Multiple Deprivation (IMD) used to assign levels of deprivation by person's home address where IMD 1 is for the most deprived and IMD 5 is for the least deprived areas.

Diabetes Prevention Programme: Introduction

The NHS Diabetes Prevention Programme (DPP) offers courses of intervention to people who are identified with a high risk of developing type 2 diabetes in order to reduce that risk.

People are eligible[1] for referral to the DPP if they have had a glycaemic test result in the appropriate range (HbA1c: 42 – 47 mmol/mol; fasting plasma glucose: 5.5 – 6.9 mmol/l) within the last 24 months (this was 12 months, but has been extended during the COVID-19 pandemic). Not everyone with an NDH diagnosis will be eligible to be referred to the DPP; some will have a diagnosis from prior to the last 24 months, without test results in the appropriate range over the last 24 months.

Some people with a GP recorded DPP offer do not have a provider record of their DPP referral, and some people with a provider recorded DPP referral are not recorded on their GP system with a GP diagnosis of NDH.

559,770 people with a current GP record of NDH, have been offered DPP and not declined it, according to their GP record.

Of people with a recent[4] NDH diagnosis (from Jan 2020 onwards), 85% had a blood glucose reading in 2020-21 that meant they could be referred to the DPP.

Table 4: Blood glucose eligibility[2,3] for the DPP within the audit period, GP-recorded non-diabetic hyperglycaemia (NDH), 2019-20 - 2020-21, England

Blood glucose tested in audit period				Eligible for NHS DPP in audit period			
2019-20		2020-21		2019-20		2020-21	
Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
1,670,925	78.1	1,597,930	67.2	1,192,365	71.4	1,039,770	65.1

Source: NHS Digital

Notes:

1. NHS England: 2019 NHS Diabetes Prevention Programme National Service Specification, NHS England: 2020: Briefing: COVID-19: New Healthier You referral route.

2. People included: registered at a GP practice that participated in NDA 2019-20 / 2020-21..

3. Blood glucose monitoring may include a HbA1c or a fasting plasma glucose test. Eligibility is based on test results within the 15 month audit period.

4. People may have multiple dates of diagnosis recorded.

Diabetes Prevention Programme: Diagnoses

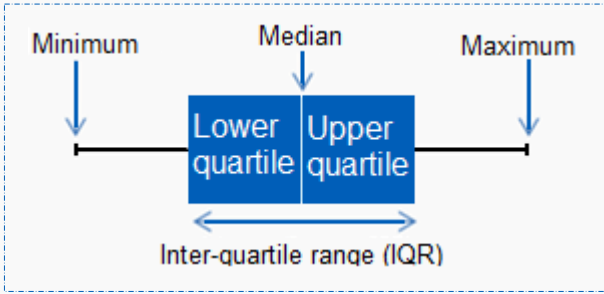
Table 5: People with a DPP referral[1], by GP recording of diabetes or non-diabetic hyperglycaemia, 2020-21, England

Diagnosis in GP record	Number	Per cent
Total	663,020	
- NDH diagnosis present	408,065	61.5
- Diabetes diagnosis present	13,065	2.0
- No diagnosis present	241,890	36.5

Source: NHS Digital

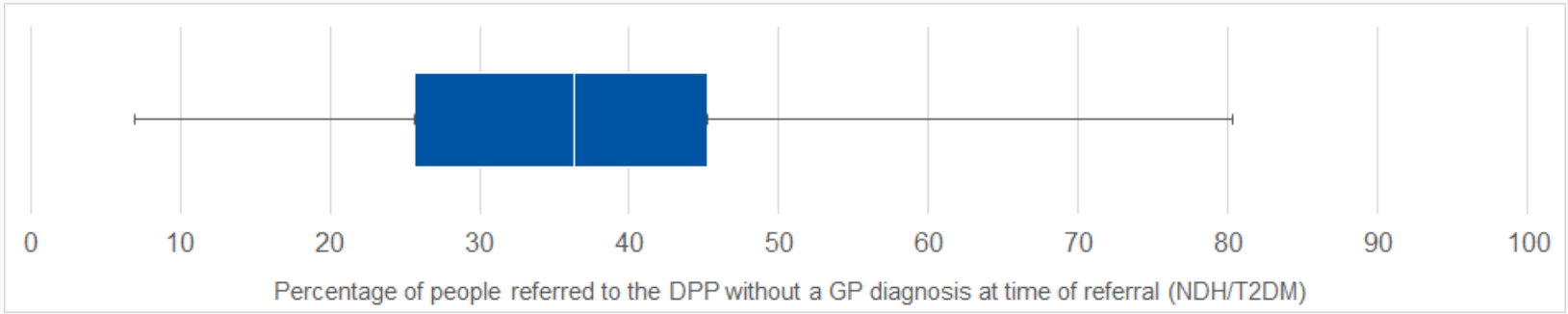
DPP providers record information about the people who have been referred to them, and how people interact with the service.

Since the DPP began, more than 1 in 3 people referred had no GP-recorded NDH diagnosis associated with elevated blood glucose levels.



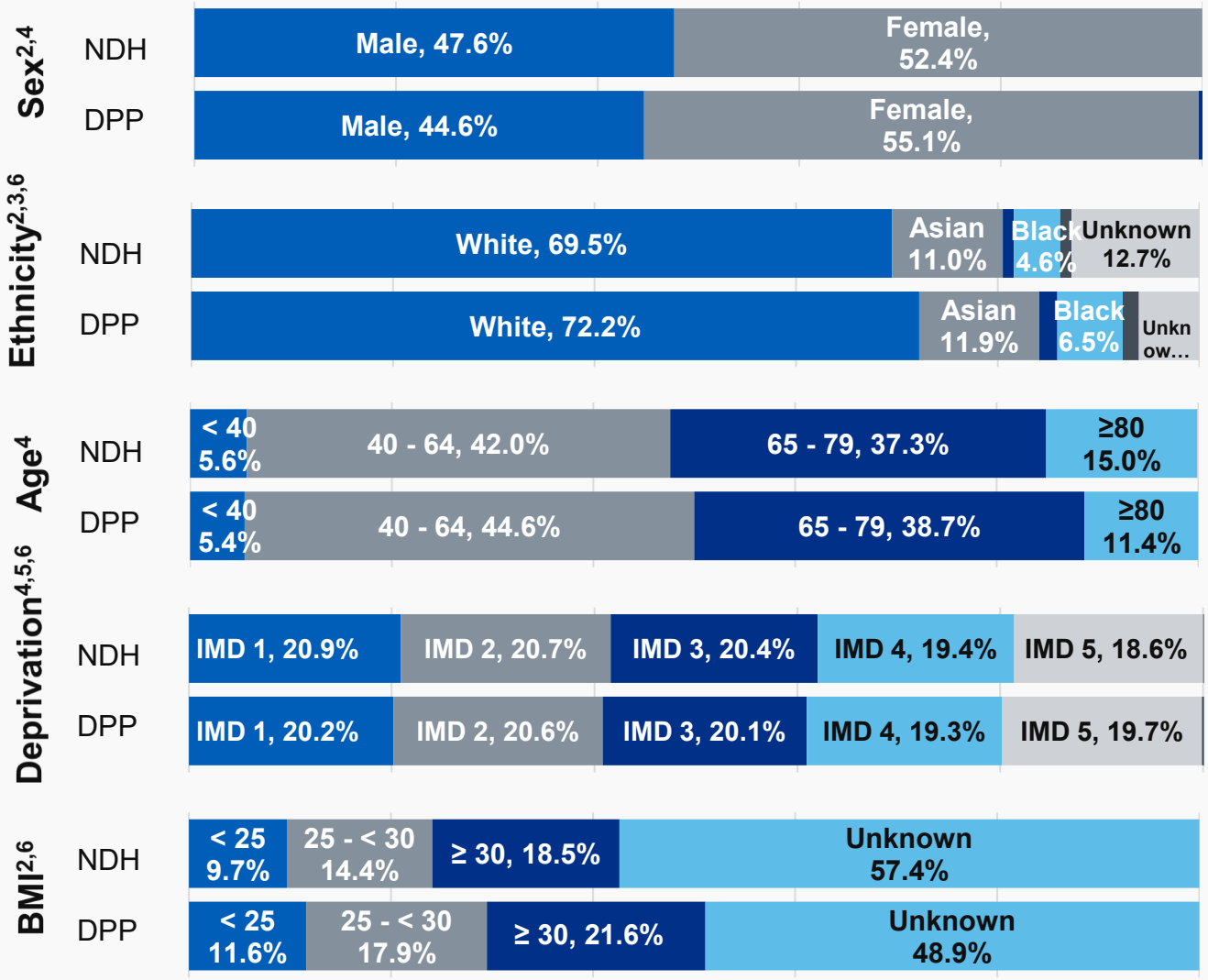
Notes:
1. People included: with a known valid NHS number; registered at a GP practice that participated in NDA 2020-21, with a referral to the DPP programme as recorded by one of the DPP providers.
2. People included: with a known valid NHS number; registered at a GP practice that participated in NDA 2020-21, with a referral to the DPP programme as recorded by one of the DPP providers.
3. CCGs included: with at least 100 people referred to the Diabetes Prevention Programme (104 of 106 CCGs).

Figure 9: DPP referrals[2] without a GP recorded diagnosis, by CCG[3], GP-recorded non-diabetic hyperglycaemia (NDH) or diabetes, provider DPP referral, 2020-21, England



Diabetes Prevention Programme: Demographics

Figure 10: Demographic breakdown of people, by NDH diagnosis[1], DPP referral[2] status, GP-recorded non-diabetic hyperglycaemia / provider DPP referral, 2020-21, England



Recommendation 2

GP practices should appropriately offer to refer eligible people with non-diabetic hyperglycaemia to the Diabetes Prevention Programme to reduce their risk of developing type 2 diabetes.

Notes:

1. People included: those registered at a GP practice that participated in NDA 2020-21.
2. People included: with a referral to the DPP (i) Sex and ethnicity are only recorded at initial assessment. People who have been referred but not attended an initial assessment are not included in these breakdowns. (ii) BMI as recorded during 2020-21, as part of a referral that was open during 2020-21.
3. The unlabelled ethnicity categories with very low volumes are **'Mixed'** and **'Other'.** Ethnicity is categorised using the 2011 census categories for ethnic group.
4. The low volume 'Unknown' categories have not been labelled for the sex, age and deprivation characteristic breakdowns.
5. Index of multiple deprivation (IMD) used to assign levels of deprivation by person's home address where IMD 1 is for the most deprived and IMD 5 is for the least deprived areas.
6. Percentage sums may not equal 100 due to rounding.

Non-Diabetic Hyperglycaemia, 2020-21

Prepared in collaboration with:

HQIP
Healthcare Quality Improvement Partnership

The Healthcare Quality Improvement Partnership (HQIP) is led by a consortium of the Academy of Medical Royal Colleges, the Royal college of Nursing, and National Voices. Its aim is to promote quality improvement in patient outcomes, and in particular, to increase the impact that clinical audit, outcome review programmes and registries have on healthcare quality in England and Wales. HQIP holds the contract to commission, manage, and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP), comprising around 40 projects covering care provided to people with a wide range of medical, surgical and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual projects, other devolved administrations, and crown dependencies. www.hqip.org.uk/national-programmes

NHS Digital

NHS Digital is the trading name for the Health and Social Care Information Centre (HSCIC). NHS Digital managed the publication of the 2020-21 annual report.

DIABETES UK
KNOW DIABETES. FIGHT DIABETES.

Diabetes UK is the charity leading the fight against the most devastating and fastest growing health crisis of our time, creating a world where diabetes can do no harm.

This audit report is part of the National Diabetes Audit programme; for more information, please visit the NDA webpage at **https://digital.nhs.uk/NDA**

Or for further information, please contact NHS Digital's Contact Centre on **0300 303 5678**, or email **enquiries@nhsdigital.nhs.uk**.