FIRST ANNUAL AUDIT
REPORT

Office for Health
Improvement
& Disparities

CVDPREVENT

NHS
Benchmarking Network

(for the baseline audit period up to March 2020)

Using data to drive cardiovascular disease prevention

HQIP
Healthcare Quality
Improvement Partnership

The CVDPREVENT audit is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP). 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**.

The CVDPREVENT audit aims to support quality improvement in the prevention of cardiovascular disease (CVD) in primary care in England.

This report was prepared by the NHS Benchmarking Network (NHSBN) and the Office for Health Improvement and Disparities (OHID) - the National Cardiovascular Intelligence Network (NCVIN) team. The audit is delivered by a partnership between NHS Digital, NCVIN and the NHSBN. To ensure patient involvement in the audit, the NHSBN work closely with the Patients Association.

NHS BENCHMARKING NETWORK (NHSBN)

The NHS Benchmarking Network is a member led organisation promoting service improvement in the NHS through benchmarking and sharing good practice. Members are providers and commissioners of NHS services, spanning the acute, community and mental health sectors. The NHSBN team support members in sharing data to compare service provision and performance with the aim of identifying improvement opportunities. In addition, the NHSBN run national clinical audits.

NATIONAL CARDIOVASCULAR INTELLIGENCE NETWORK (NCVIN) - OFFICE FOR HEALTH IMPROVEMENT & DISPARITIES (OHID)

NCVIN interprets and translates complex data for national and local stakeholders, to inform policy and local decision making and to improve cardiovascular services and outcomes for patients. The team produces trustworthy cardiovascular health intelligence products including profiles and specialist analyses that are innovative and focus on user needs.

NHS DIGITAL

NHS Digital is the trading name of the Health and Social Care Information Centre, which is the national provider of information, data and IT systems. The team design, develop and operate the national IT and data services that support clinicians at work, help patients get the best care, and use data to improve health and care.

PATIENTS ASSOCIATION

The Patients Association is a national health and social care campaigning charity which has been in existence for 51 years. With its motto 'Listening to Patients, Speaking up for Change' it strives to ensure that patients' views and experiences are heard. Themes from a national Helpline, large scale surveys and casework influence its campaigns. The Patients Association also works with NHS organisations to facilitate service improvement through national project work and staff training involving patients and carers.

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FOREWORD

The CVDPREVENT audit grew from the conviction that the vast wealth of data held in general practice (GP) records could be harnessed to improve identification and management of conditions that put people at higher risk of cardiovascular disease (CVD). The audit has been many years in the making and we value the significant support and commitment from a wide range of partners, together with the strong clinical engagement we have had throughout. We are delighted to introduce the first iteration of outputs including this first annual report.

We now have access to a large and complex data set covering more than 15 million people, which is being regularly updated. In this first report, data from relevant patient records to March 2020 is analysed to provide a pre-pandemic baseline on a priority set of prevalence and clinical indicators.

As the audit develops, the conditions and indicators covered will be expanded to paint a comprehensive picture across the CVD prevention pathway. Crucially, CVDPREVENT will link data to quality improvement resources to support leaders on the ground to implement new technologies and transform the way we work in primary care. In summer 2022, the second report will be enhanced by further data including the COVID-19 pandemic period to March 2021.

The pandemic has created significant momentum for tackling existing health inequalities. Uniquely, the breadth and depth of data held by CVDPREVENT enables us to review age, sex, ethnicity and deprivation to highlight with more precision where quality improvement efforts should be targeted to help reduce health inequalities.

Working with the Patients Association, CVDPREVENT has recruited a Patient Panel to ensure the patient perspective is at the heart of audit delivery. We look forward to working with the Patient Panel and many other stakeholders committed to CVD prevention as we develop this exciting programme over the coming years.

Dr Shahed Ahmad

National Clinical Director for Cardiovascular Disease Prevention
NHS England and NHS Improvement

Dr Peter Green
CVDPREVENT (Workstream 3) Audit Clinical Lead

EXECUTIVE SUMMARY

This first report presents analysis of GP recorded data for relevant patient cohorts up to March 2020 and therefore provides a pre-pandemic baseline for indicators of CVD prevention.

An important focus of the analysis is to understand variation in identification, diagnosis and management of people at risk of CVD across dimensions of potential health inequity including deprivation, age, sex and ethnicity. In addition, comorbidities amongst patients with conditions that put them at higher risk of CVD are considered, with an initial focus on those people with hypertension.

The report highlights improvement opportunities for CVD prevention at a national level. Comparable data at local level is provided in the **CVDPREVENT Data and Improvement Tool** which, for prevalence, provides detailed analysis by age and sex for each Clinical Commissioning Group (CCG) in England and for clinical indicators provides analysis of age, sex and ethnicity at Primary Care Network (PCN) level. Integrated Care System (ICS) views are also available.

Readers of the report are encouraged to review the comparable data in the Data and Improvement Tool to identify the groups of people, at each system level, who could most benefit from quality improvement activity.

Improvement opportunities identified at a national level in this report are as follows:

- About 4 in 10 people with recorded hypertension also had obesity. Prevalence of obesity is correlated with deprivation, and hence wider efforts to address health inequalities and rising levels of obesity would contribute to reducing CVD.

- Those diagnosed with hypertension in the working age population, particularly males, could be better managed. A focus is needed on people from Black ethnic minority groups in the management of hypertension.

- Initiatives to improve the management of atrial fibrillation (AF) could be targeted at females, particularly in the 40 to 59 age group, and Black, Asian and ethnic minority groups.

- The audit results suggest under recording of familial hypercholesterolaemia (FH) in England and missed opportunities to identify people with this genetic condition at a younger age.

- A high proportion of those with CVD have been prescribed lipid lowering therapy, however, an area of focus for improvement may be females, with CVD, aged 40 to 59 years.

- The proportion of those with chronic kidney disease (CKD) prescribed lipid lowering therapy (for either primary or secondary prevention of CVD) was lower than for those with CVD. As for the CVD cohort, females, in this case in all age groups, were less likely to receive lipid lowering therapy and may therefore be a focus for more active management.

- For both the CVD and CKD cohorts, people from Black ethnic minority groups were less likely than those in other groups to be prescribed lipid lowering therapy, suggesting a further area for potential improvement.

It was reassuring to note that the results did not highlight significant variation in performance on clinical indicators across deprivation quintiles.

INTRODUCTION

CVDPREVENT is a new national primary care audit that uses data extracted from GP records.[1] It will support primary care in understanding how many people with CVD or conditions that lead to a higher risk of developing CVD are potentially undiagnosed, under treated or over treated. Analysis and reporting of the audit will support systematic quality improvement (QI) to reduce health inequalities and improve outcomes for individuals and populations. The CVDPREVENT audit is part of broader strategic objectives outlined in the **NHS Long Term Plan** and national **CVD prevention ambitions** to prevent 150,000 strokes, heart attacks and cases of dementia over the next ten years.

Data[2] is extracted for people that fall within the following cohorts:

COHORT 1 – people with a coded diagnosis of at least one of the following six high-risk conditions:
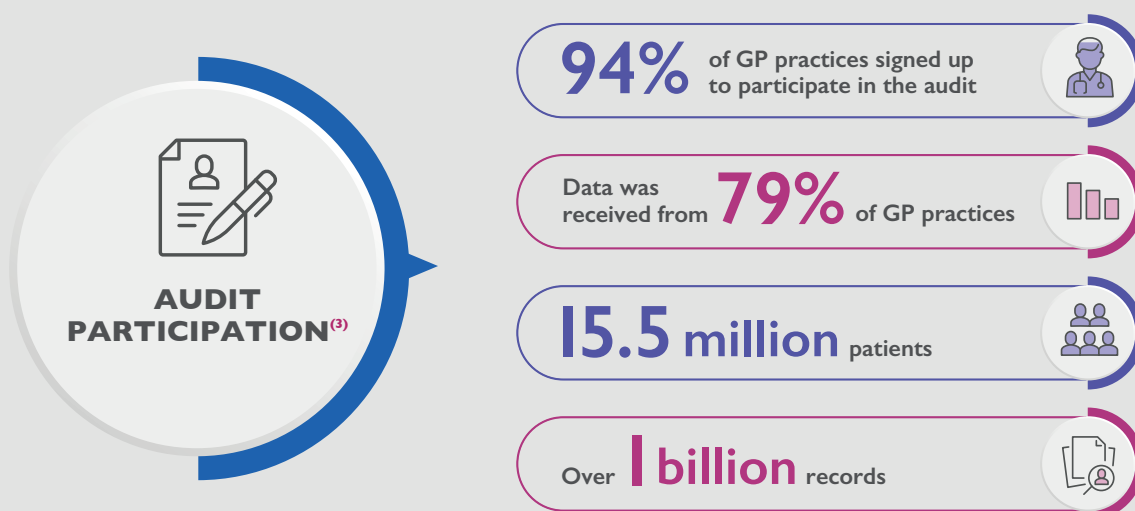
- Atrial fibrillation (AF)
- Hypertension
- Familial hypercholesterolaemia (FH) and other hyperlipidaemias
- Chronic kidney disease (CKD)
- Non-diabetic hyperglycaemia (NDH)
- Type 1 or type 2 diabetes mellitus

COHORT 2 – people with pre-existing cardiovascular disease comprising at least one of the following:

- Stroke or transient ischaemic attack (TIA)
- Coronary heart disease (CHD)
- Heart failure (HF)
- Abdominal aortic aneurysm (AAA)
- Peripheral arterial disease (PAD)

COHORT 3 – case finder cohort consisting of people with clinical records with readings that suggest the possibility of an undiagnosed high-risk condition

This first annual report details the findings relating to data from relevant patient records up to March 2020. It is planned that the second annual report covering data to March 2021 will be published in summer 2022, with biannual updates to follow.

AUDIT PARTICIPATION[3]

94% of GP practices signed up to participate in the audit

Data was received from **79%** of GP practices

15.5 million patients

Over **1 billion** records

STRUCTURE OF THIS REPORT

To address the overall aim of improving CVD prevention, the audit is working towards answering four key questions (figure 1). Audit indicators have been developed to begin to address these key questions for each of the six high risk conditions. Not all the questions for all six conditions have been answered comprehensively in this first report.

The initial focus is on atrial fibrillation, blood pressure, cholesterol and chronic kidney disease. The audit aims to complete the picture over subsequent iterations of the audit and, where relevant, by pointing readers to other data sources such as the **National Diabetes Audit**.

Future CVDPREVENT indicators will align with developments within the CVD Prevention Directed Enhanced Service (DES), Investment and Impact Fund (IIF), Quality and Outcomes Framework (QOF) Quality Improvement (QI) module and other policy and guidance where possible. The CVDPREVENT quality improvement strategy will align QI resources to the audit indicators so that impact can be measured, as illustrated in the driver diagram at figure 1.

In this report, variation is reviewed at CCG level.[4] PCN level reporting of the clinical indicators can be found in the **CVDPREVENT Data and Improvement Tool**. Analysis of prevalence by ethnicity is not reported on due to missing ethnicity data, particularly for smaller ethnic groups.[5]

All findings are based on extracts of recorded data from 79% of GP practices in England. The section 'Reading this report' (page 32) provides an explanation of the chart formats used.

Figure 1:
CVDPREVENT driver diagram
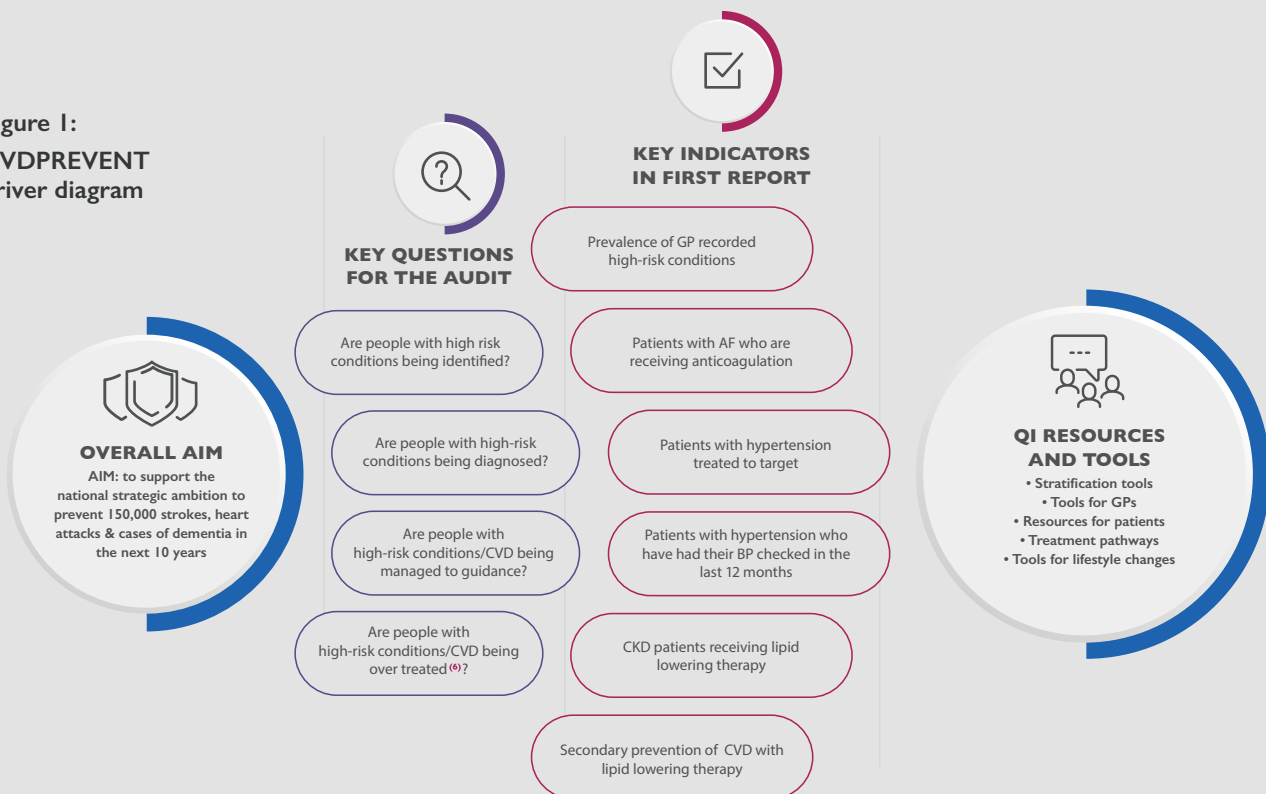
FINDINGS
ATRIAL FIBRILLATION (AF)

Are people with high-risk conditions being identified?

Identification of people with AF will be addressed in future iterations of the audit.

Are people with high-risk conditions being diagnosed?

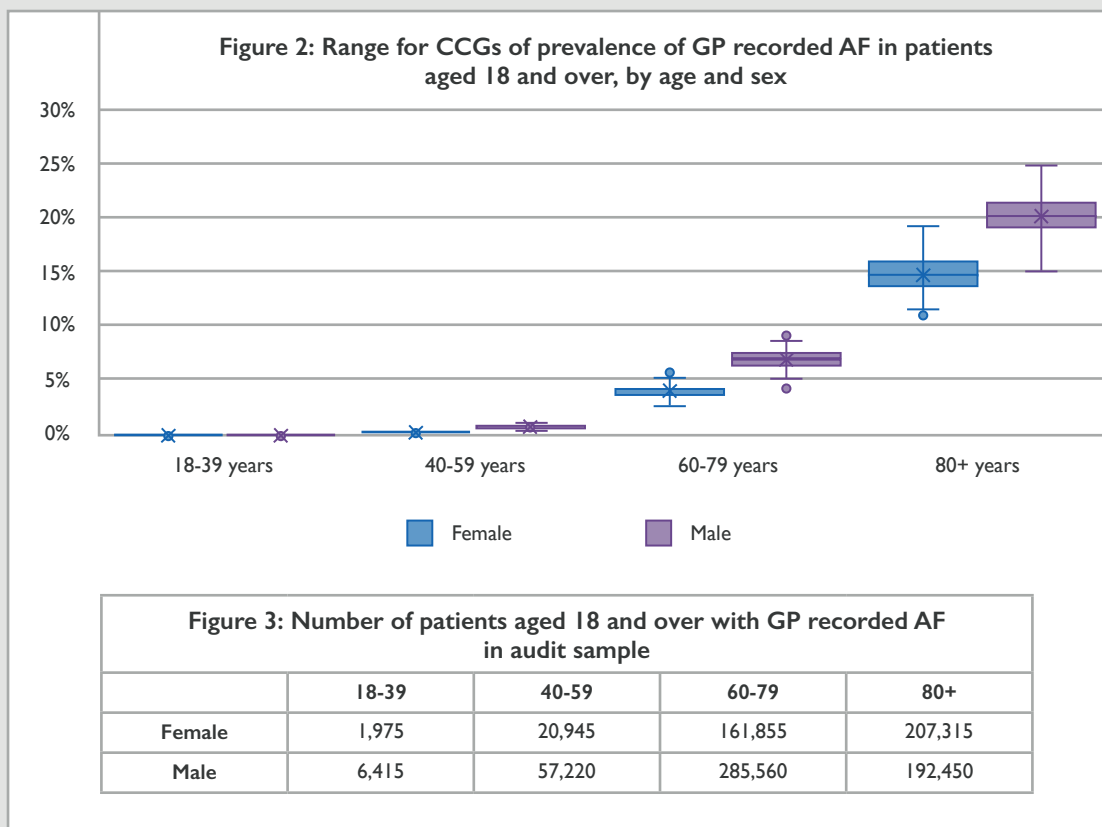Are people with high-risk conditions/CVD being managed to guidance?

ARE PEOPLE WITH HIGH-RISK CONDITIONS BEING DIAGNOSED?

Variation in the prevalence of atrial fibrillation (AF) could indicate where diagnosis of certain patient cohorts is being missed, although does not measure whether everyone with AF has been diagnosed. The following indicator is considered:

Prevalence of GP recorded AF in patients aged 18 and over.[7]

- The prevalence of GP recorded AF in England was **2.4%**[8]
- Prevalence of AF in males **(2.8%)** was higher than for females **(2.0%)**
- AF prevalence increased with age to **5.0%** of those aged 60 to 79 years and **17.2%** of those aged 80+
- AF prevalence recorded at CCG level ranged from **1.1%** to **4.2%**, with variation increasing with age
- After adjustment for age, prevalence across deprivation quintiles in England was similar

Figure 2: Range for CCGs of prevalence of GP recorded AF in patients aged 18 and over, by age and sex

Figure 3: Number of patients aged 18 and over with GP recorded AF in audit sample

	18-39	40-59	60-79	80+
Female	1,975	20,945	161,855	207,315
Male	6,415	57,220	285,560	192,450

Unadjusted CVDPREVENT data showed that the prevalence of recorded AF was greater in the least deprived areas. Given that AF is more prevalent in older age groups (figure 2) and areas of higher deprivation usually have a younger age profile, synthetic estimates to take account of the age distribution were created.[9] The estimates suggested that the prevalence of GP recorded AF between areas with different levels of deprivation is likely to be similar. Note that the estimates only took account of age and no other possible effects.
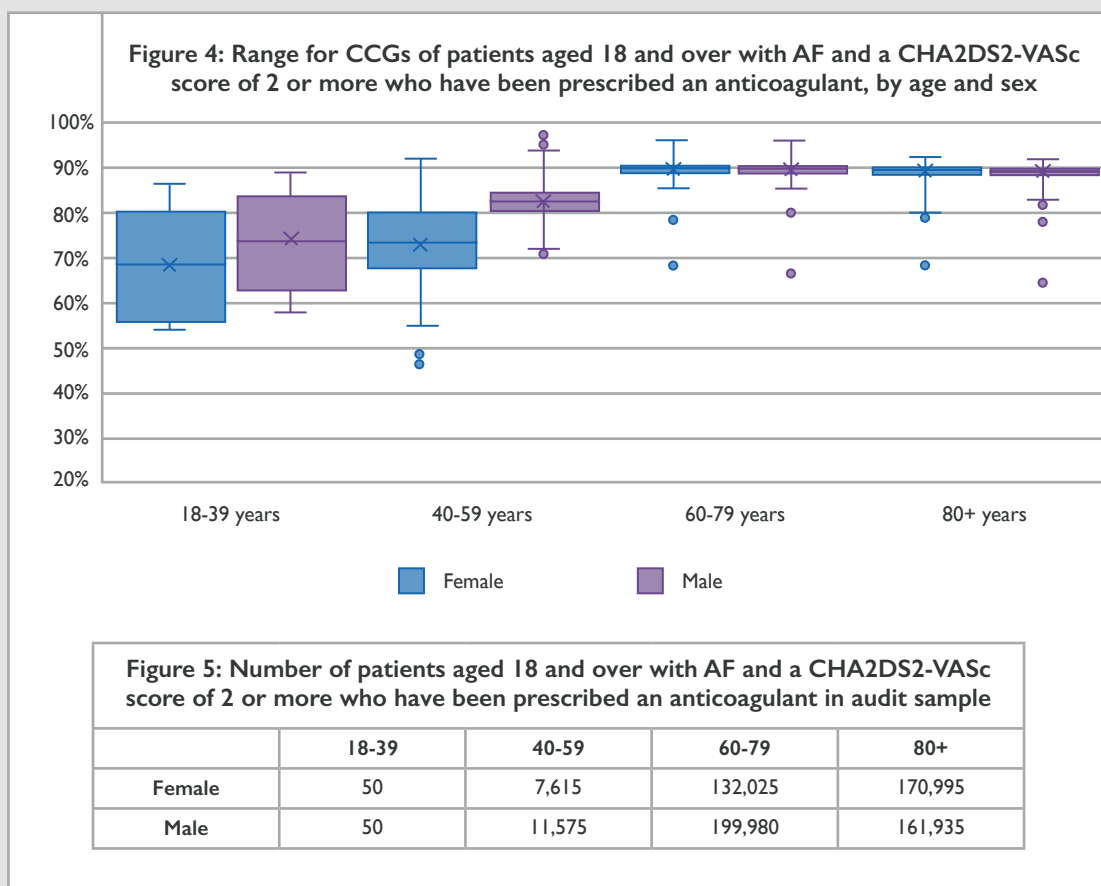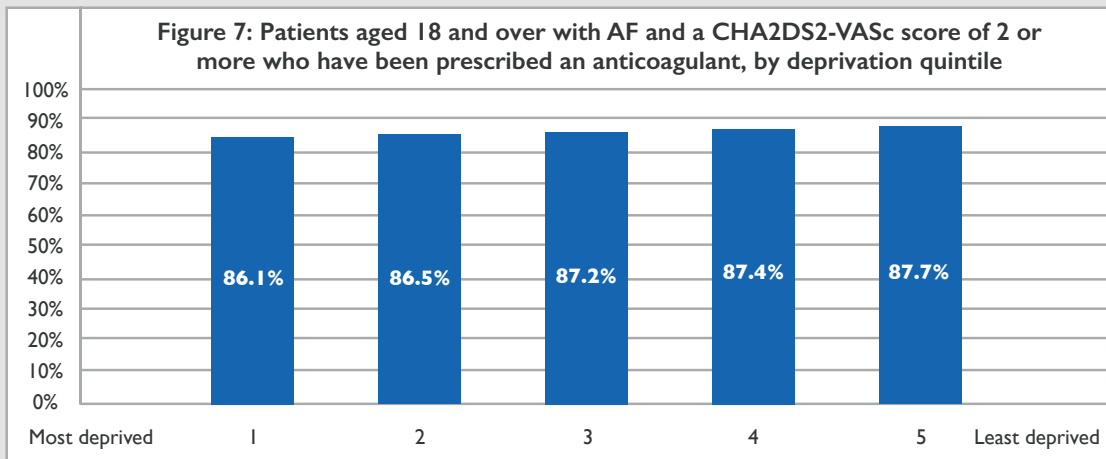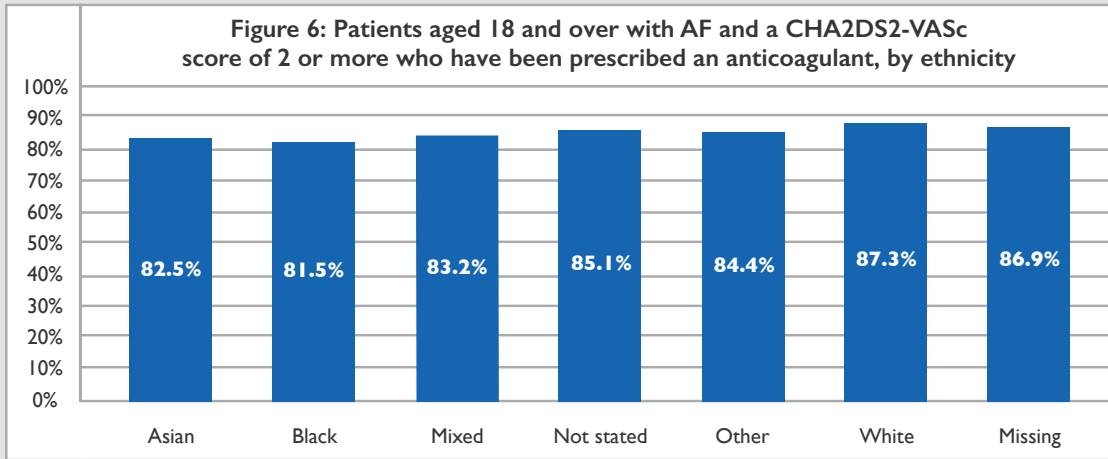
ARE PEOPLE WITH HIGH-RISK CONDITIONS/ CVD BEING MANAGED TO GUIDANCE?

The following indicator measures whether patients with AF are being treated so that their clinical readings fall within the targets set in NICE guidance:

The percentage of patients aged 18 and over with GP recorded AF and a record of a CHA2DS2-VASc score of 2 or more who are currently treated with anticoagulation drug therapy.[10]

- **87.0%** of patients with AF and a CHA2DS2-VASc score of 2 or more in England had a recorded prescription of an anticoagulant

- Females aged 40 to 59 years were less likely **(73.3%)** than males in that age group **(82.5%)** to be prescribed an anticoagulant, although the gap closed in the over 60 age groups

- There was wide variation at CCG level from **66.5%** to **92.8%**

- Patients in the White ethnic group[11] were most likely **(87.3%)** to be prescribed an anticoagulant, and those in the Black ethnic group least likely **(81.5%)**

- There was no significant difference in prescription of anticoagulation between most and least deprived quintiles in England

Figure 4: Range for CCGs of patients aged 18 and over with AF and a CHA2DS2-VASc score of 2 or more who have been prescribed an anticoagulant, by age and sex

Figure 5: Number of patients aged 18 and over with AF and a CHA2DS2-VASc score of 2 or more who have been prescribed an anticoagulant in audit sample

	18-39	40-59	60-79	80+
Female	50	7,615	132,025	170,995
Male	50	11,575	199,980	161,935

Figure 6: Patients aged 18 and over with AF and a CHA2DS2-VASc score of 2 or more who have been prescribed an anticoagulant, by ethnicity

Ethnicity	Percentage
Asian	82.5%
Black	81.5%
Mixed	83.2%
Not stated	85.1%
Other	84.4%
White	87.3%
Missing	86.9%

Figure 7: Patients aged 18 and over with AF and a CHA2DS2-VASc score of 2 or more who have been prescribed an anticoagulant, by deprivation quintile

Deprivation quintile	Percentage
Most deprived 1	86.1%
2	86.5%
3	87.2%
4	87.4%
5 Least deprived	87.7%

ATRIAL FIBRILLATION: COMMENTARY

AF is a heart condition that causes irregular and often abnormally fast heart rate. The condition is largely a consequence of cardiovascular ageing and hence, as shown in the audit results, is more common in older age groups. Whilst audit results showed prevalence of AF in the working age population was less than 1.0%, this rose to 5.0% in people aged 60 to 79 years, and 17.2% in people aged over 80. The audit results were also consistent with research showing the incidence of AF is greater in males than females, with the gap closing with age.[12] However, further research may be warranted to confirm the extent of the gap between the sexes and to understand the reasons for the difference.

Available data enabled prescription of anticoagulants to be measured but it is recognised that having a medication prescribed is not the same as taking a medication. The audit found females aged 40 to 59 years with AF and a CHA2DS2-VASc score of 2 or more were less likely **(73.3%)** than males in that age group **(82.5%)** to be prescribed an anticoagulant. Research suggests that although stroke prevention with anticoagulation in chronic AF is a priority in both males and females, females derive the most benefit from it.[13]

Research shows AF is less prevalent in older Black, Asian and ethnic minority groups than in the White ethnic group.[14] The audit results showed those in the White ethnic group were most likely to be prescribed an anticoagulant.

The audit results for AF at a national level suggest initiatives to improve the treatment of AF could be targeted at females, particularly in the 40 to 59 age group, and non-White ethnic groups.

Wide variation in prevalence, and prescribing, at CCG level could reflect local population profiles but may also suggest room for improvement in detecting, recording and managing AF in some localities. Local improvement opportunities are highlighted in the **CVDPREVENT Data and Improvement Tool**.

FINDINGS
HYPERTENSION

Are people with high-risk conditions being identified?

Identification of people with hypertension will be addressed in future iterations of the audit using the case finding cohort.

Are people with high-risk conditions being diagnosed?

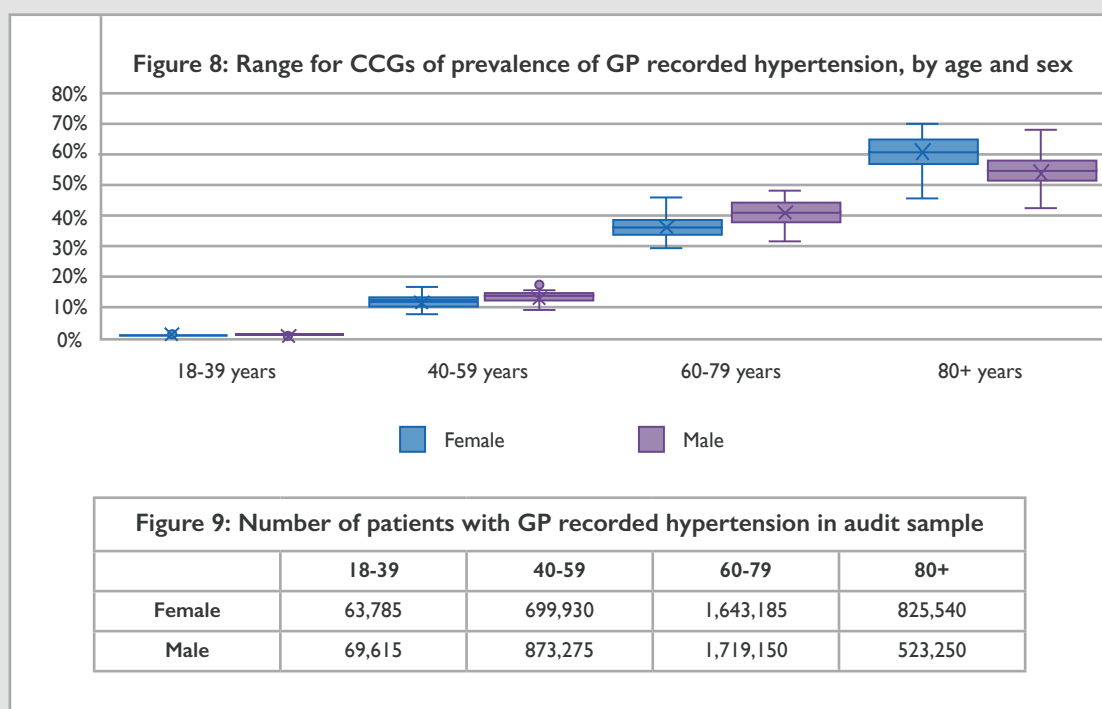## Are people with high-risk conditions/CVD being managed to guidance?

ARE PEOPLE WITH HIGH-RISK CONDITIONS BEING DIAGNOSED?

The following indicator is considered to assess whether diagnosis of certain patient cohorts is being missed:

Prevalence of GP recorded hypertension in patients aged 18 and over.[15]

- The prevalence of GP recorded hypertension in England was **16.4%**[16]
- When all age groups were taken together, no difference was found between males and females **(both 16.4%)**. However, hypertension prevalence was higher for males than for females in the age groups 40 to 59 years and 60 to 79 years, but lower for males aged over 80 years
- Hypertension prevalence increased with age to **58.0%** of those aged 80+
- Hypertension prevalence recorded at CCG level varied from **11.3%** to **22.8%** with variation increasing with age
- After age adjustment hypertension prevalence was 3.4 percentage points higher in the most deprived quintile in England compared to the least deprived quintile

Figure 8: Range for CCGs of prevalence of GP recorded hypertension, by age and sex

Figure 9: Number of patients with GP recorded hypertension in audit sample

	18-39	40-59	60-79	80+
Female	63,785	699,930	1,643,185	825,540
Male	69,615	873,275	1,719,150	523,250

Unadjusted CVDPREVENT data showed that the prevalence of recorded hypertension was lowest in the most deprived areas. However, given that hypertension is more prevalent in older age groups, with areas of higher deprivation usually having a younger age profile, synthetic estimates to take account of the age distribution were created. The estimates suggested that the most deprived fifth of the population had recorded hypertension prevalence 3.4 percentage points higher than the least deprived fifth of the population.
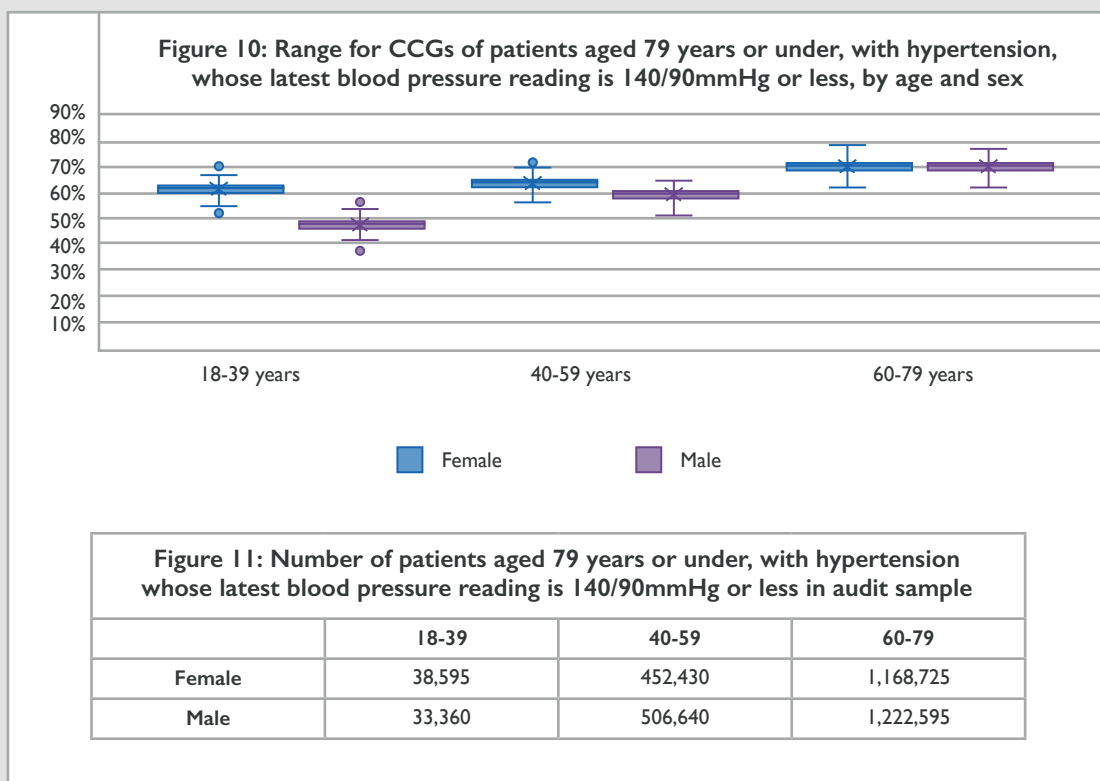
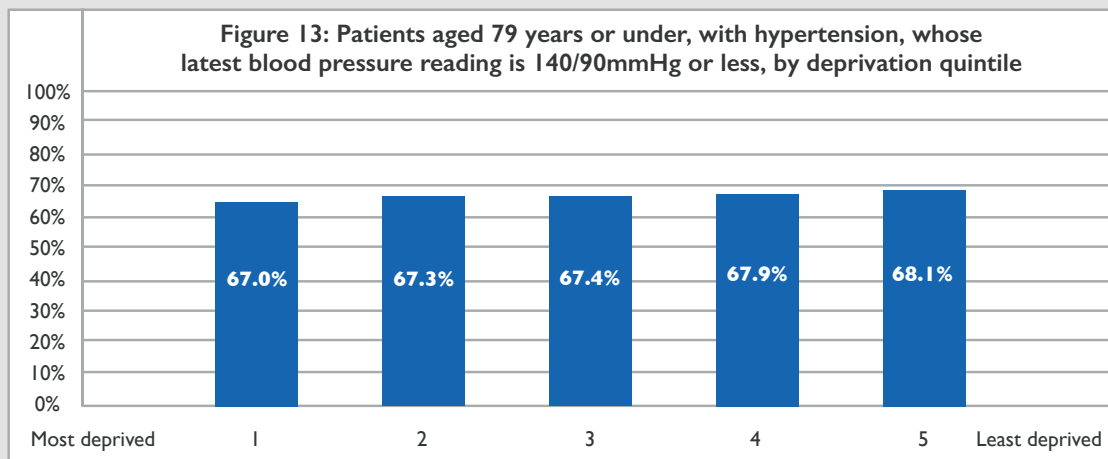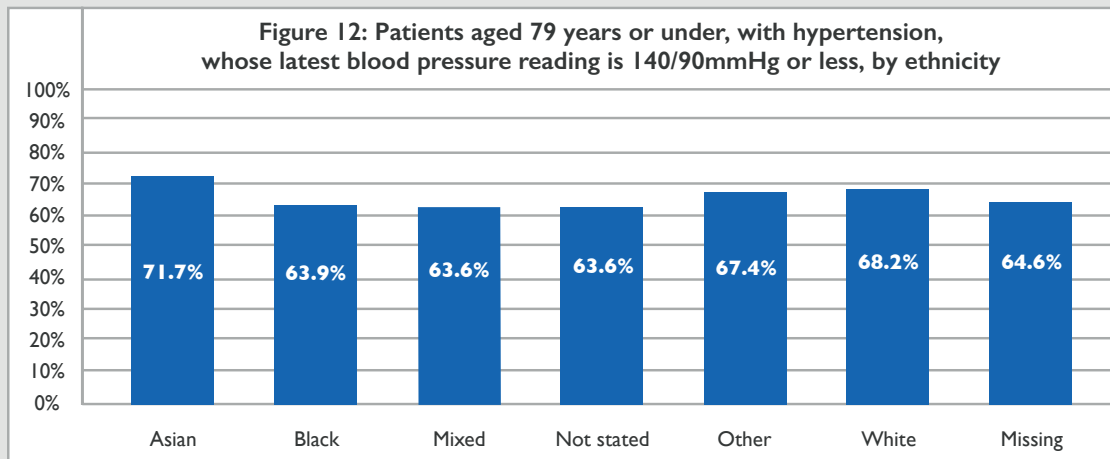# ARE PEOPLE WITH HIGH-RISK CONDITIONS/ CVD BEING MANAGED TO GUIDANCE?

The following indicators measure whether patients with hypertension are being managed to NICE guidelines:

The percentage of patients aged 18 to 79 years with GP recorded hypertension, in whom the last blood pressure reading within the preceding 12 months is equal to 140/90 mmHg or less.[17]

The percentage of patients aged 80 years or over, with GP recorded hypertension, in whom the last blood pressure reading within the preceding 12 months is 150/90 mmHg or less.[18]

- For those aged 18 to 79 years, **67.5%** were treated to the NICE guideline target

- **69.0%** of females and **66.2%** of males were treated to target with the gap between males and females being greater in working age groups (18 to 59 years)

- CCG values for this indicator range from **60.3%** to **73.0%**

- Hypertension was better managed in Asian[19] ethnic groups than other ethnic groups

- There was little variation on treatment to target across deprivation quintiles in England

Figure 10: Range for CCGs of patients aged 79 years or under, with hypertension, whose latest blood pressure reading is 140/90mmHg or less, by age and sex

Figure 11: Number of patients aged 79 years or under, with hypertension whose latest blood pressure reading is 140/90mmHg or less in audit sample

	18-39	40-59	60-79
Female	38,595	452,430	1,168,725
Male	33,360	506,640	1,222,595

Figure 12: Patients aged 79 years or under, with hypertension, whose latest blood pressure reading is 140/90mmHg or less, by ethnicity

Ethnicity	Percentage
Asian	71.7%
Black	63.9%
Mixed	63.6%
Not stated	63.6%
Other	67.4%
White	68.2%
Missing	64.6%

Figure 13: Patients aged 79 years or under, with hypertension, whose latest blood pressure reading is 140/90mmHg or less, by deprivation quintile

Deprivation quintile	Percentage
Most deprived 1	67.0%
2	67.3%
3	67.4%
4	67.9%
5 Least deprived	68.1%

- For those aged 80 years or over, **81.6%** were treated to target
- **79.8%** of females and **84.5%** of males were treated to target
- CCG results varied from **73.0%** to **86.6%** on this indicator
- Those in Asian and White ethnic groups were managed better than people in other ethnic groups
- There was little variation on treatment to target across deprivation quintile

Figure 14: Range for CCGs of patients aged 80 years or over, with hypertension, whose latest blood pressure reading is 150/90mmHg or less, by sex
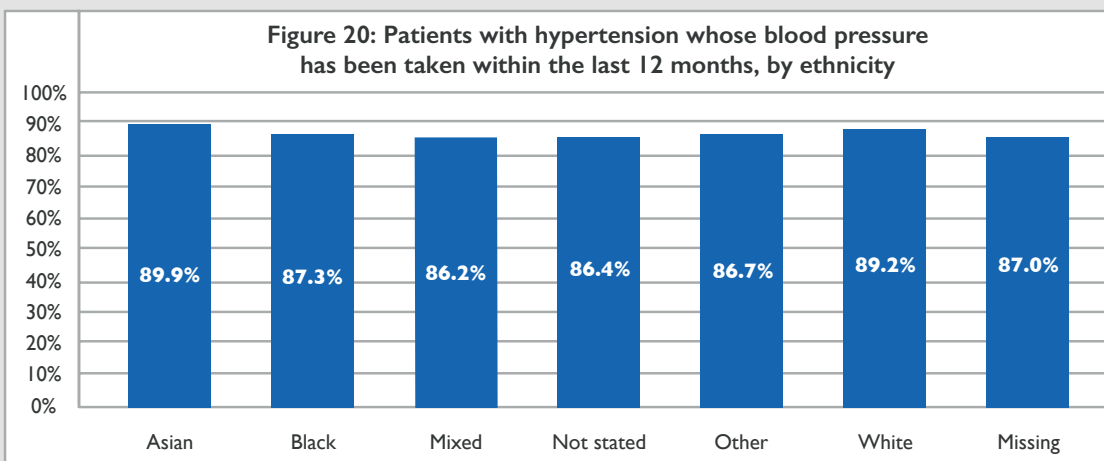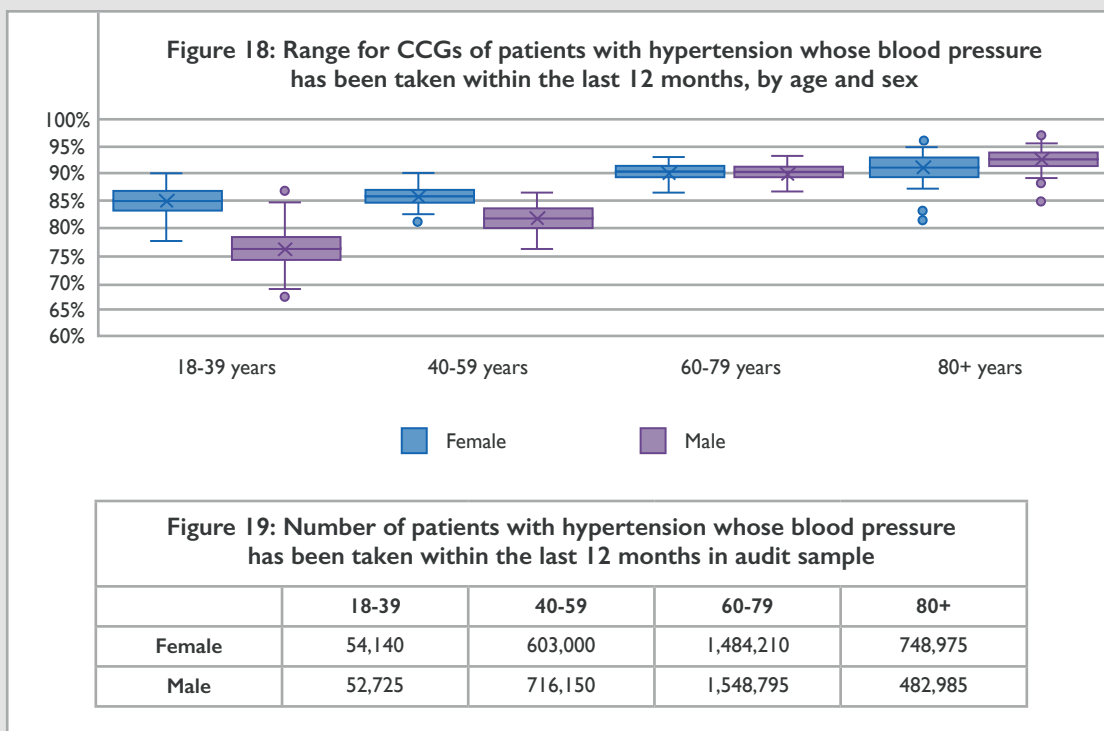
80+ years
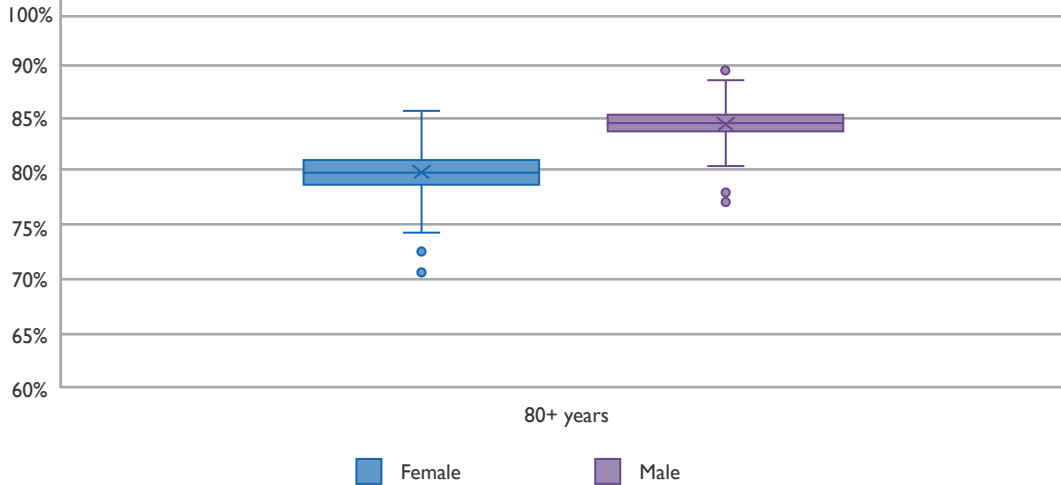
Female ■   Male ■

Figure 15: Number of patients aged 80 years and over, with hypertension, whose latest blood pressure reading is 150/90mmHg or less in audit sample

	80+
Female	658,620
Male	442,050

Figure 16: Patients aged 80 years and over, with hypertension, whose latest blood pressure reading is 150/90mmHg or less, by ethnicity

Asian	Black	Mixed	Not stated	Other	White	Missing
82.2%	79.2%	78.9%	79.3%	80.0%	82.4%	79.6%
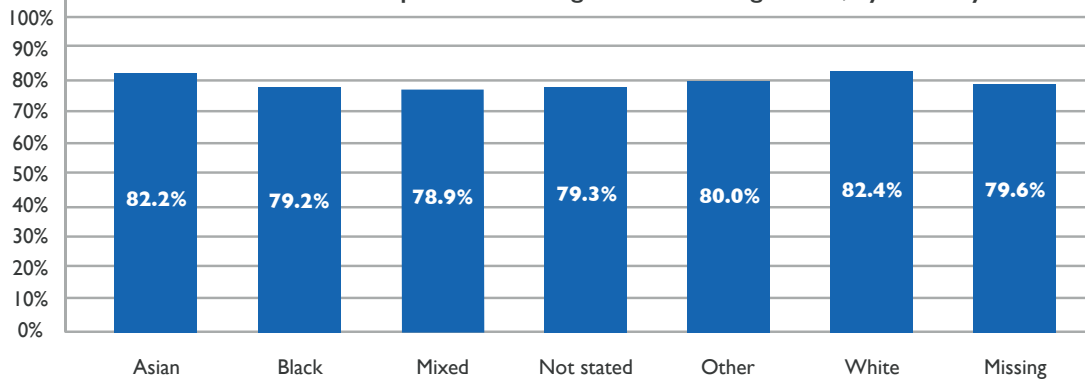
Figure 17: Patients aged 80 years and over, with hypertension, whose latest blood pressure reading is 150/90mmHg or less, by deprivation quintile

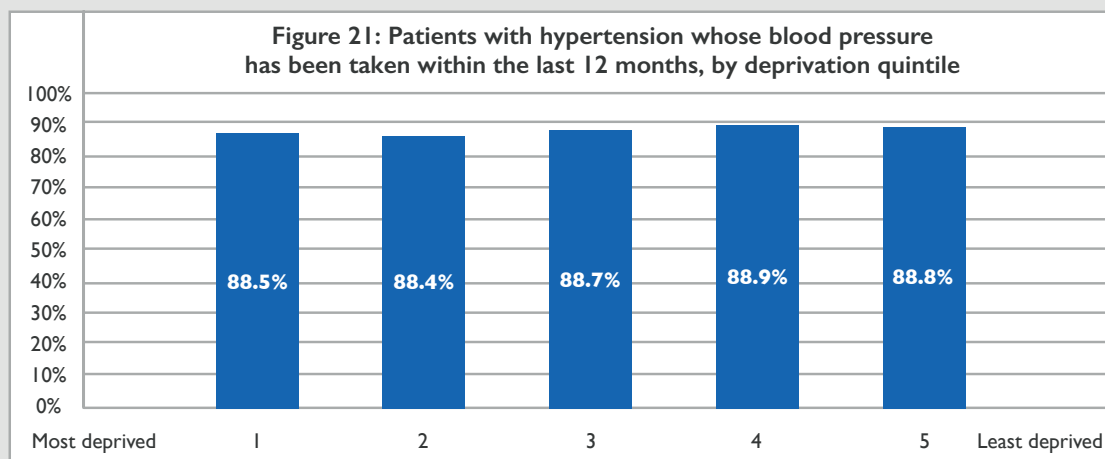| Most deprived 1	2	3	4	5 Least deprived
81.4%	81.4%	81.5%	81.8%	81.8%
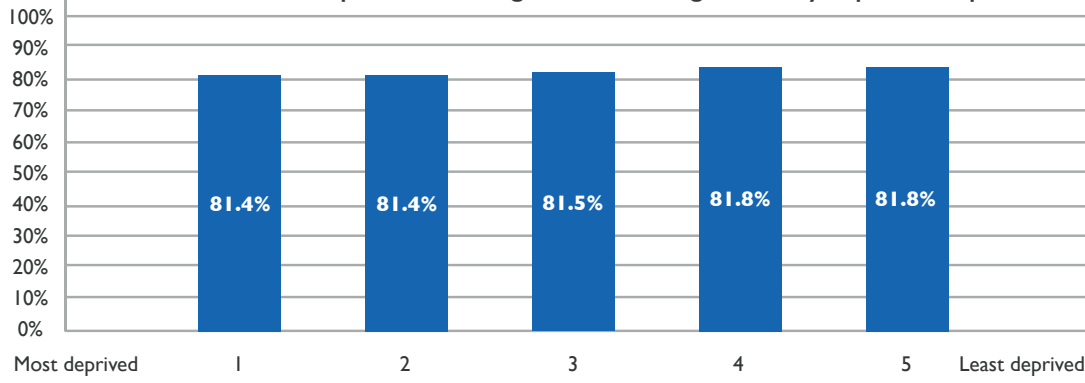
The following provides an indication of how well people with hypertension are being monitored:

The percentage of patients aged 18 and over with GP recorded hypertension who have had a blood pressure reading within the preceding 12 months.[20]

- The percentage of those with hypertension, with a blood pressure reading in the last 12 months was **88.7%**
- Monitoring of blood pressure improved with age and was better in females **(89.4%)** than males **(87.9%)**
- Males in the age group 18 to 39 years were least likely to have had a reading in the last 12 months
- CCG values ranged from **84.4%** to **91.9%** with less variation as age increased
- Asian and White groups were more actively monitored than other ethnic groups
- There was little variation between deprivation quintiles on this indicator

Figure 18: Range for CCGs of patients with hypertension whose blood pressure has been taken within the last 12 months, by age and sex

Figure 19: Number of patients with hypertension whose blood pressure has been taken within the last 12 months in audit sample

	18-39	40-59	60-79	80+
Female	54,140	603,000	1,484,210	748,975
Male	52,725	716,150	1,548,795	482,985

Figure 20: Patients with hypertension whose blood pressure has been taken within the last 12 months, by ethnicity

Asian	Black	Mixed	Not stated	Other	White	Missing
89.9%	87.3%	86.2%	86.4%	86.7%	89.2%	87.0%

Figure 21: Patients with hypertension whose blood pressure has been taken within the last 12 months, by deprivation quintile

Most deprived 1	2	3	4	5 Least deprived
88.5%	88.4%	88.7%	88.9%	88.8%

HYPERTENSION: COMMENTARY

At least half of all heart attacks and strokes are associated with hypertension and it is a major risk factor for chronic kidney disease, heart failure and dementia.[21] Lifestyle changes can lower blood pressure and prevent hypertension while antihypertensive drug therapy can effectively reduce the cardiovascular events attributed to hypertension.

The audit results show that the prevalence of hypertension increased with age, as would be expected given the normal ageing process as arteries become stiffer and less compliant. Although the prevalence of hypertension in younger people was lower than those over 80 years of age, there were over 1.6 million people with GP recorded hypertension aged 40 to 59 years and a further 3.4 million aged 60 to 79 years. The damage to blood vessels from hypertension accumulates over time and so, if the condition is left untreated in these younger groups, there is longer for damage to happen.

The 40 to 59 and 60 to 79 year age groups both showed a higher prevalence of hypertension amongst males when compared to females. However, males diagnosed with hypertension in the working age categories (18 to 59 years) were less likely to be treated to target and less likely to have had a blood pressure reading in the last 12 months, than working age females. Although research suggests the highest prevalence of hypertension is found in the Black ethnic group,[22] Black people with hypertension were less likely to be treated to target and have had a recent blood pressure reading, than Asian and White people.

After age adjustment hypertension prevalence was 3.4 percentage points higher in the most deprived quintile in England compared to the least deprived quintile. This result was consistent with population level analysis published by Health Survey for England in 2011 suggesting people from the most deprived areas in England are more likely than those in the least deprived areas to have hypertension.[23] The CVDPREVENT audit results showed little variation across deprivation quintiles for treatment to target and regular blood pressure tests.

The audit results for hypertension at a national level suggest quality improvement initiatives could be targeted at better managing those diagnosed with hypertension in the working age population, particularly males. A focus is needed on people in the Black ethnic group in the management of hypertension.

Potential improvement opportunities at ICS, CCG and PCN level can be found in the **CVDPREVENT Data and Improvement Tool**.

Are people with high-risk conditions being identified?

Identification of people with cholesterol will be addressed in future iterations of the audit using the case finding cohort.

Are people with high-risk conditions being diagnosed?

Are people with high-risk conditions/CVD being managed to guidance?
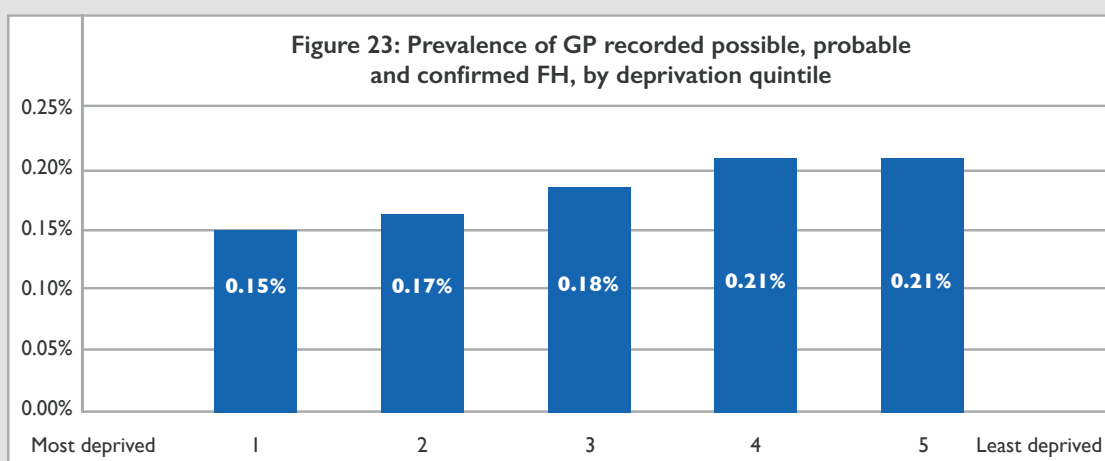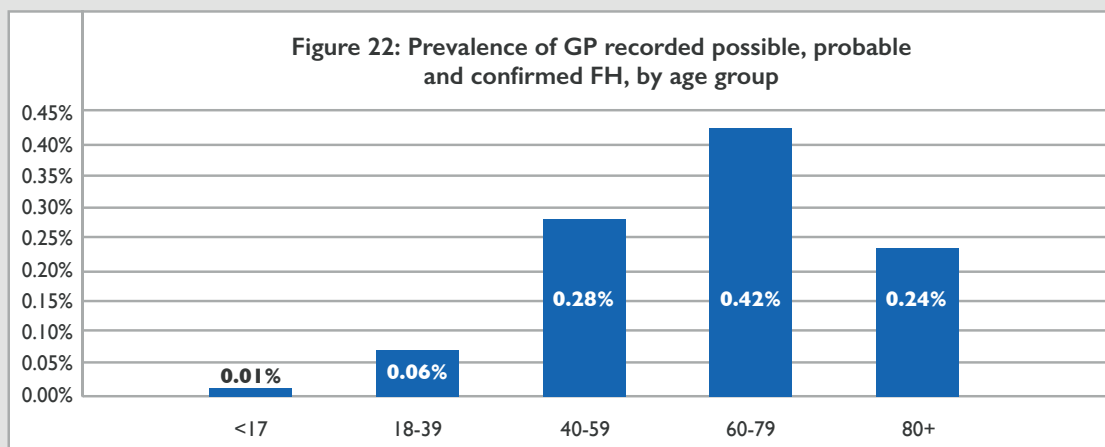
ARE PEOPLE WITH HIGH-RISK CONDITIONS BEING DIAGNOSED?

Prevalence indicators for high cholesterol are not yet available as this is not currently a recorded condition under QOF.

Familial hypercholesterolaemia (FH) is a genetic disorder that makes the body unable to remove low density lipoprotein (LDL) cholesterol from the blood. The following prevalence indicators are reviewed for FH:

Prevalence of GP recorded possible, probable and confirmed FH, all ages.[24]

Prevalence of genetically confirmed FH, all ages.[25]

- Prevalence of GP recorded possible, probable and confirmed FH, all ages was **0.2%** (90,341 patients)
- GP recorded prevalence increased with age up to 79 years, suggesting FH is rarely being picked up in younger people
- The number of genetically confirmed cases of FH (all ages) recorded by GP practices was 4,504

Figure 22: Prevalence of GP recorded possible, probable and confirmed FH, by age group

Figure 23: Prevalence of GP recorded possible, probable and confirmed FH, by deprivation quintile

ARE PEOPLE WITH HIGH-RISK CONDITIONS/ CVD BEING MANAGED TO GUIDANCE?

The indicators on the treatment of high cholesterol to NICE guidelines considered in this first annual report are as follows:

The percentage of patients aged 18 and over with GP recorded CVD[26] with a previous prescription for lipid lowering therapy.[27]

The percentage of patients aged 18 and over with GP recorded CKD with classification of categories G3a to G5 (previously stage 3 to 5), with a previous prescription for lipid lowering therapy.[28]

- The percentage of patients with CVD and a previous prescription for lipid lowering therapy was **92.9%**

- For those aged 40 or over, the group of patients with CVD least likely to have a prescription for a lipid lowering therapy were females aged 40 to 59 years **(83.0%)**

- CCG variation was from **90.1%** to **95.6%**

- People in Black ethnic groups were least likely to have a recorded prescription for a lipid lowering therapy **(88.2%)**, and people in Asian ethnic groups most likely **(95.3%)**

- For patients with CVD, prescription of a lipid lowering therapy was high **(above 92%)** across all deprivation quintiles, with little variation between quintiles

Figure 24: Range for CCGs of patients aged 18 and over with GP recorded CVD, with a previous prescription for lipid lowering therapy, by age and sex

Figure 25: Number of patients aged 18 years and over, with GP recorded CVD with a previous prescription for lipid lowering therapy in audit sample				
	18-39	40-59	60-79	80+
Female	2,465	76,520	356,705	296,115
Male	5,245	192,305	711,750	317,575

Figure 26: The percentage of patients aged 18 and over with GP recorded CVD, with a previous prescription for lipid lowering therapy, by ethnicity

Ethnicity	Percentage
Asian	95.3%
Black	88.2%
Mixed	89.6%
Not stated	91.1%
Other	91.8%
White	93.3%
Missing	91.7%

Figure 27: The percentage of patients aged 18 and over with GP recorded CVD, with a previous prescription for lipid lowering therapy, by deprivation quintile

Deprivation quintile	Percentage
Most deprived 1	93.7%
2	93.1%
3	92.7%
4	92.7%
5 Least deprived	92.6%

- The percentage of patients with CKD (categories G3a to G5) with a previous prescription for lipid lowering therapy was **74.0%**
- Females in all age groups with CKD were less likely than their male counterparts to have a prescription for a lipid lowering therapy
- CCG variation was from **65.2%** to **82.2%** and was higher in the younger age groups
- People in Black ethnic groups were least likely to have a prescription for a lipid lowering therapy **(67.4%)** and people in Asian ethnic groups most likely **(84.3%)**
- Prescription of a lipid lowering therapy for patients with CKD was lowest **(70.5%)** in the least deprived quintile and highest **(78.7%)** in the most deprived quintile

Figure 28: Range for CCGs of patients aged 18 and over with GP recorded CKD, with classification of categories G3a to G5, with a previous prescription for lipid lowering therapy, by age and sex
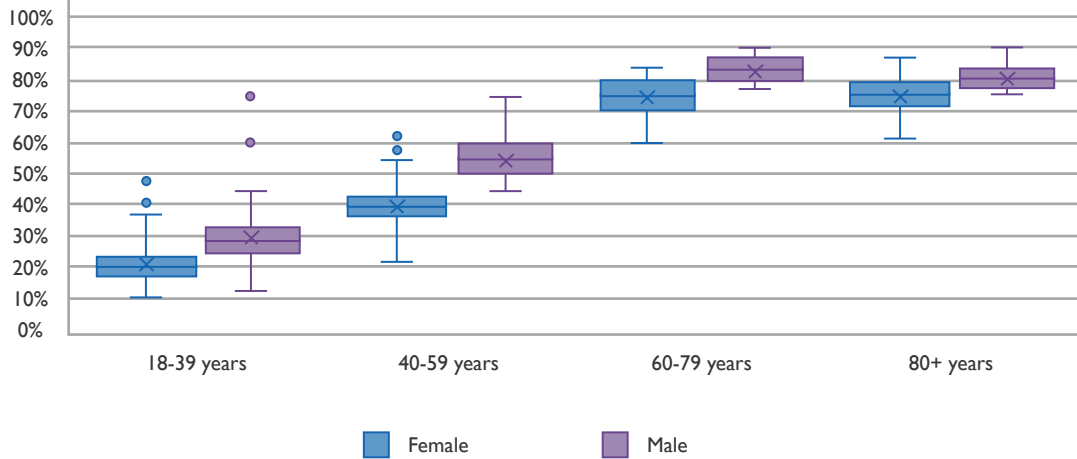
Female | Male

Figure 29: Number of patients aged 18 and over with GP recorded CKD, with classification of categories G3a to G5, with a previous prescription for lipid lowering therapy in audit sample

	18-39	40-59	60-79	80+
Female	950	24,485	285,910	320,430
Male	1,430	30,670	260,010	215,495

Figure 30: The percentage of patients aged 18 and over with GP recorded CKD with classification of categories G3a to G5, with a previous prescription for lipid lowering therapy, by ethnicity

Asian	Black	Mixed	Not stated	Other	White	Missing
84.3%	67.4%	68.2%	70.5%	75.9%	74.8%	70.5%

Figure 31: The percentage of patients aged 18 and over with GP recorded CKD with classification of categories G3a to G5, with a previous prescription for lipid lowering therapy, by deprivation quintile

Most deprived 1	2	3	4	5 Least deprived
78.7%	75.7%	73.4%	72.4%	70.5%
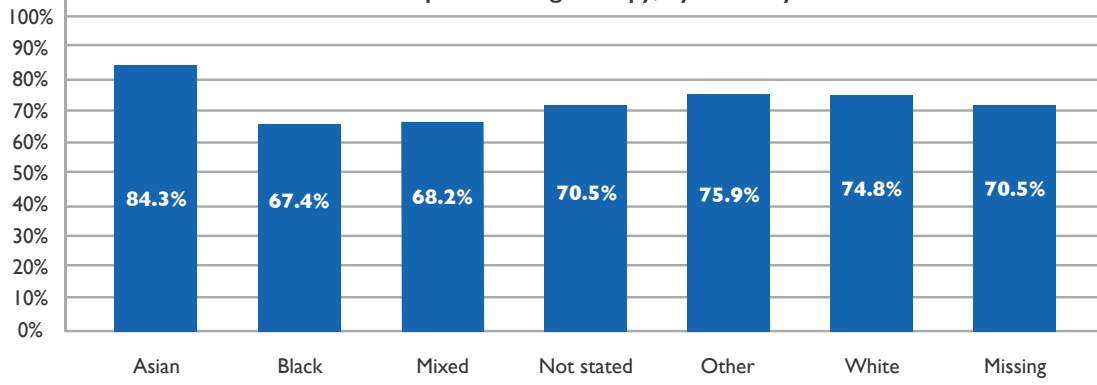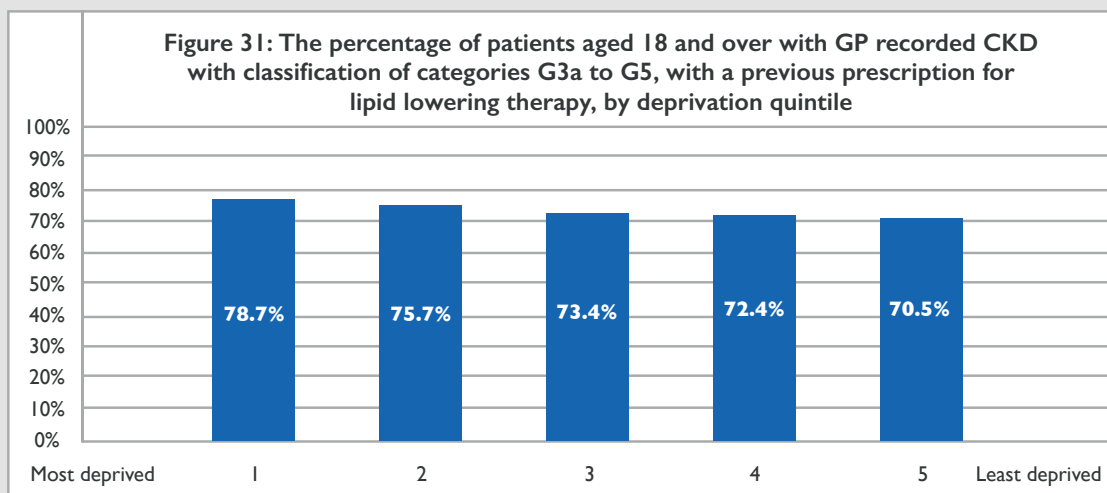
CHOLESTEROL: COMMENTARY

Whilst the body needs cholesterol to build healthy cells, high levels of cholesterol can increase the risk of heart disease or stroke by causing fatty deposits to build up in the arteries. High cholesterol can be reduced through healthy lifestyle choices and, where appropriate, by lipid lowering therapies.

FH is a genetic condition affecting an estimated 150,000 people in England (NHS Long Term Plan). The audit sample **(79% of GP practices)** showed around 90,000 possible, probable or confirmed cases of FH recorded by GPs in England. Whilst coding in primary care in this area is imperfect, the audit results suggest under recording of FH in England and missed opportunities to identify people with this genetic condition at a younger age.

The results showed a high proportion of those with CVD have been prescribed a lipid lowering therapy **(92.9%)**, with strong performance across all CCGs and deprivation quintiles. The lower level of prescribing for those aged 18 to 39 years may reflect the fact that not all people with CVD in this age group will have atherosclerotic CVD. An area of focus for improvement in the treatment of people with CVD may be females aged 40 to 59 years.

The proportion of those with CKD prescribed a lipid lowering therapy was lower than for those with CVD at **74.0%**. CCGs show greater variation on this indicator, suggesting potential improvement opportunities in some localities. As for the CVD cohort, females, in this case in all age groups, were less likely to receive lipid lowering therapy and may therefore be a focus for improvement.

For both the CVD and CKD cohorts, people in Black ethnic groups were less likely than those in other ethnic groups to be prescribed lipid lowering therapy, suggesting another area for potential improvement.

Contrary to earlier research[29] for both CVD and CKD cohorts the Asian ethnic groups were most likely to have a recorded prescription for a lipid lowering therapy. Researchers may wish to investigate further to confirm this improvement.

Are people with high-risk conditions being identified?

The question of identification of people with CKD in primary care was addressed by the National Chronic Kidney Disease Audit (January 2017).[30]

Are people with high-risk conditions being diagnosed?

Are people with high-risk conditions/CVD being managed to guidance?

The management of people with CKD to guidance was addressed by the National Chronic Kidney Disease Audit (January 2017).[31]
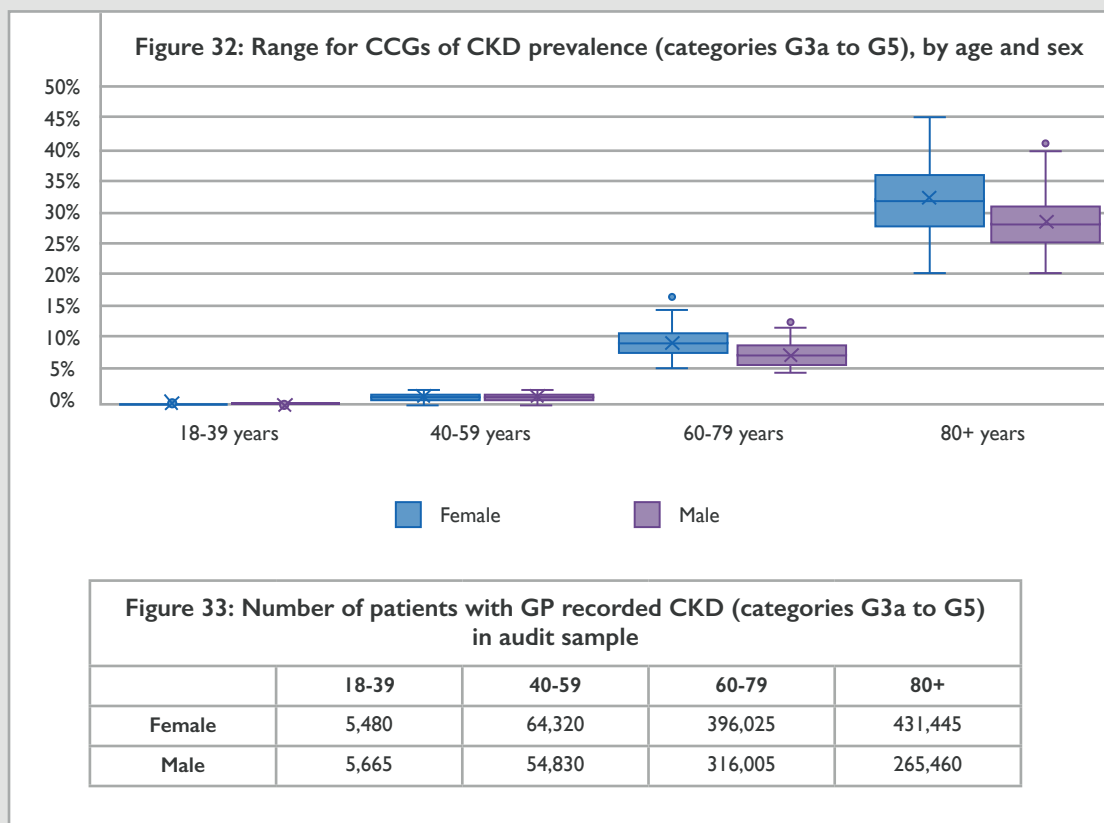
ARE PEOPLE WITH HIGH-RISK CONDITIONS BEING DIAGNOSED?

The following indicator of prevalence is considered to assess whether patients with chronic kidney disease (CKD) are being missed:

Prevalence of GP recorded Chronic Kidney Disease with classification of categories G3a to G5 (previously stage 3 to 5) in patients aged 18 and over.[32]

- The prevalence of GP recorded CKD with categories G3a to G5 was **3.9%**[33]

- CKD prevalence increased with age to **30%** of those aged 80+

- Females **(4.6%)** were more likely than males **(3.3%)** to be recorded as having CKD

- CKD prevalence recorded at CCG level varied from **2.0%** to **7.3%**, with greater variation in older age groups

- After age adjustment, CKD prevalence was 1.2 percentage points higher in the most deprived quintile in England compared to the least deprived quintile

Figure 32: Range for CCGs of CKD prevalence (categories G3a to G5), by age and sex

Figure 33: Number of patients with GP recorded CKD (categories G3a to G5) in audit sample				
	18-39	40-59	60-79	80+
Female	5,480	64,320	396,025	431,445
Male	5,665	54,830	316,005	265,460

Unadjusted CVDPREVENT data showed that the prevalence of CKD (categories G3a to G5) was lowest in the most deprived areas. Given that CKD is more prevalent in older age groups and areas of higher deprivation usually have a younger age profile, synthetic estimates to take account of the age distribution were created. These estimates suggested that the prevalence of GP recorded CKD increased as populations were more deprived, the most deprived being 1.2 percentage points higher than the least deprived.

CHRONIC KIDNEY DISEASE: COMMENTARY

Patients with CKD have a strong risk of CVD partially, but not wholly, explained by the presence of hypertension and diabetes.[34]

Research evidence suggests women have a higher burden of CKD due to damage to the kidneys caused by more frequent urinary tract infections and damage caused during pregnancy,[35] and this was borne out by the CVDPREVENT audit results.

COMORBIDITIES IN PATIENTS WITH HYPERTENSION

High risk conditions for CVD frequently occur and can be managed together. Existing data sources tend to report on single conditions failing to describe the whole picture of CVD morbidity and may compromise possible approaches to primary and secondary prevention of CVD.

Analysis of the CVDPREVENT data illustrates the extent of comorbidity in people with CVD high-risk conditions and people with established CVD. This section focuses on people with recorded hypertension. The qualifying conditions for CVDPREVENT alongside the reported obesity (BMI over 30) and high cholesterol readings were reviewed in the comorbidity analysis (figure 34).

Figure 34: Conditions which are included in the CVDPREVENT comorbidity analysis	
High risk conditions for CVD	**Cardiovascular conditions**
Hypertension	Coronary heart disease (CHD)
Atrial fibrillation (AF)	Stroke/Transient ischaemic attack (TIA)
Chronic kidney disease (CKD)	Peripheral arterial disease (PAD)
Non diabetic hyperglycaemia (NDH)	Abdominal aortic aneurism (AAA)
Type 1 and 2 diabetes	Heart failure (HF)
Other reported factors	
BMI 30 or higher (people classified as obese)	Hyperlipidaemia[36]

- Six and a half million people in the audit sample have GP recorded hypertension

- One in five **(22%)** of people with hypertension have GP recorded CVD

- In people who have GP recorded hypertension, a minority of people **(28.7%)** have no other recorded comorbidity

- Slightly more females than males had no other recorded comorbid conditions **(51.8% females and 48.2% males)**

- The number of recorded conditions varied with age (figure 35) but overall there was little difference in the number of comorbidities by sex

- From the data available, there were no consistent patterns for the ethnic groups with hypertension and one or more other conditions, in the different age groupings

- Obesity was the most common risk factor that was recorded in people with hypertension. About 4 in 10 people **(39.4%)** with recorded hypertension also had a GP record of obesity (figure 36)

- In all people with a GP record of hypertension, **1.5%** had the three most common CVD/high risk conditions (diabetes, CKD and CHD), together (figure 37)

Figure 35: Proportion of people in age group by number of comorbid conditions, all persons with GP recorded hypertension

Legend:
- Hypertension and 5+ conditions
- Hypertension and 4 conditions
- Hypertension and 3 conditions
- Hypertension and 2 conditions
- Hypertension and 1 condition
- Hypertension only
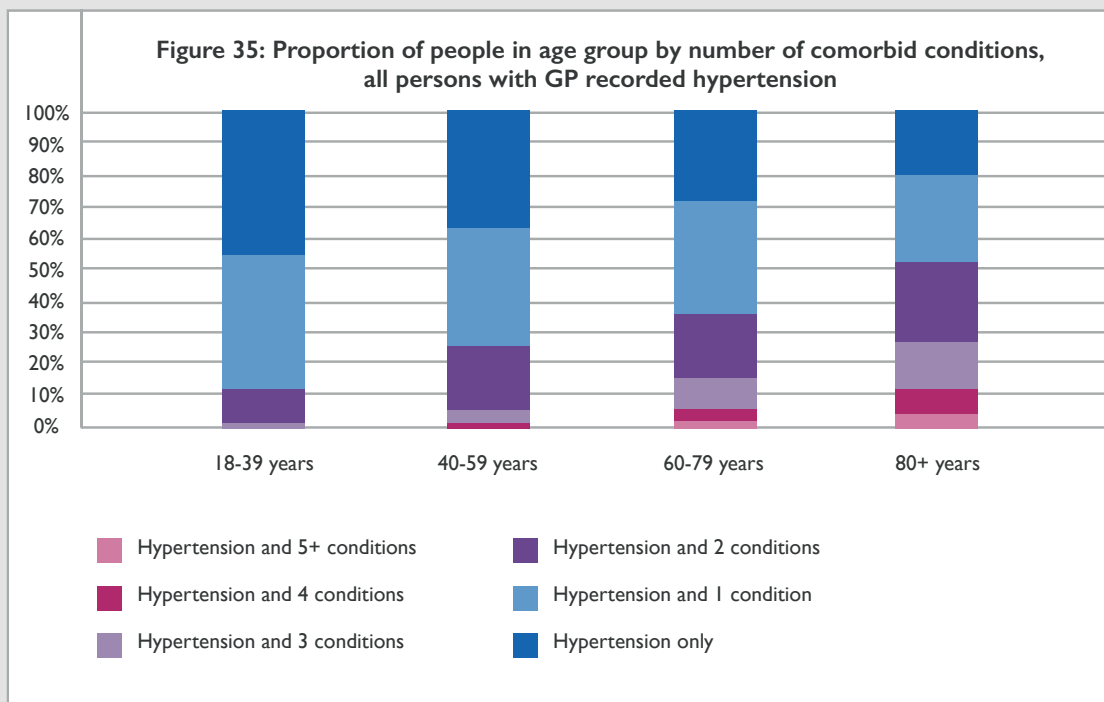
Figure 36: Proportion of people with hypertension and other risk factors/CVD, by age					
	18-39	40-59	60-79	80+	18 and over
BMI 30 or over (people classified as obese)	48.2%	50.9%	40.2%	23.2%	39.4%
Diabetes types 1 and 2	11.9%	20.3%	25.0%	24.1%	23.4%
CKD (stages G3a to G5)	3.5%	3.9%	14.2%	38.9%	16.6%
CHD	0.7%	4.7%	12.7%	21.4%	12.3%
Hyperlipidaemia	2.2%	6.3%	11.1%	12.5%	10.0%
AF	0.3%	1.6%	7.6%	20.3%	8.6%
Stroke/TIA	0.9%	2.8%	7.2%	15.4%	7.7%
NDH	2.3%	4.6%	6.0%	6.3%	5.6%
HF	0.6%	1.0%	3.2%	9.3%	3.9%
PAD	0.1%	0.7%	2.9%	4.6%	2.7%
AAA	0.0%	0.0%	0.8%	1.3%	0.7%

Figure 37: Venn diagram showing proportions of people with GP recorded hypertension and with different combinations of diabetes, CKD and CHD

DIABETES 15.1% n=972k

3.8% n=246k

CKD 9.1% n=587k

1.5% n=97k

2.9% n=186k

2.2% n=139k

CHD 5.7% n=369k
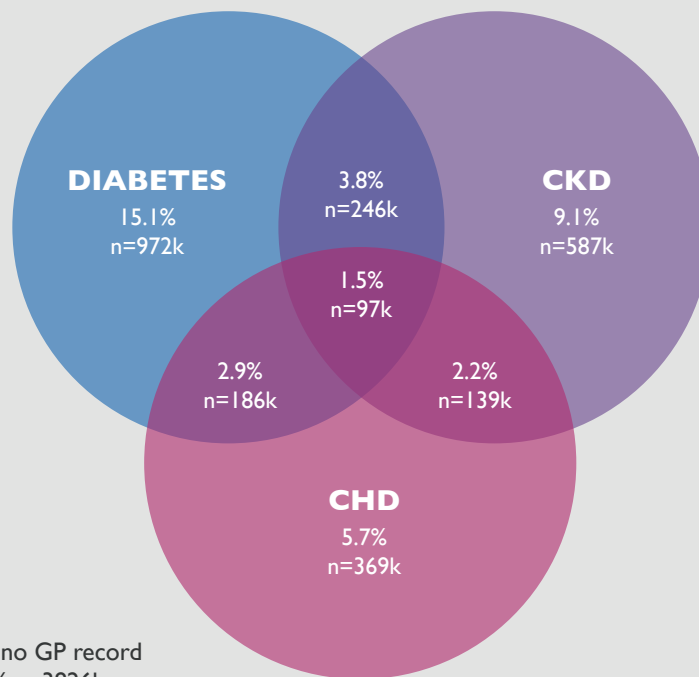
People with hypertension and no GP record of diabetes, CKD or CHD 60% n=3826k

COMORBIDITIES: COMMENTARY

Hypertension is the most commonly recorded CVD high-risk condition in CVDPREVENT and a minority (28.7%) of people with hypertension have no other CVD related morbidity. The number of comorbidities increases with age, but there was little difference in the number of comorbidities by sex. It is difficult to determine any difference in the number of comorbidities for people with hypertension by different ethnic group due in part to the large amount of missing ethnicity data. From the data available, there were no consistent patterns for the ethnic groups with hypertension and one or more other conditions, in the different age groupings.

The most common comorbidities occurring in people with registered hypertension are obesity, diabetes, CKD, CHD and hyperlipidaemia. The level of obesity in people with hypertension, at about 40%, is higher than the level of obesity in the general population which is estimated to be 29% in females and 27% in males.[37] Prevalence of obesity is correlated with deprivation,[38] and hence wider efforts to address health inequalities and rising levels of obesity would contribute to reducing CVD.[39] Further audit analysis could be considered to understand the correlation between prevalence of obesity and hypertension by deprivation.

READING THIS REPORT

Throughout the report, boxplots and column charts are used to visualise the data. The boxplot displays the variation in CCG values for the indicator shown and the column charts display the England mean positions. Further detail on these charts is provided below.

Example Chart - Boxplot
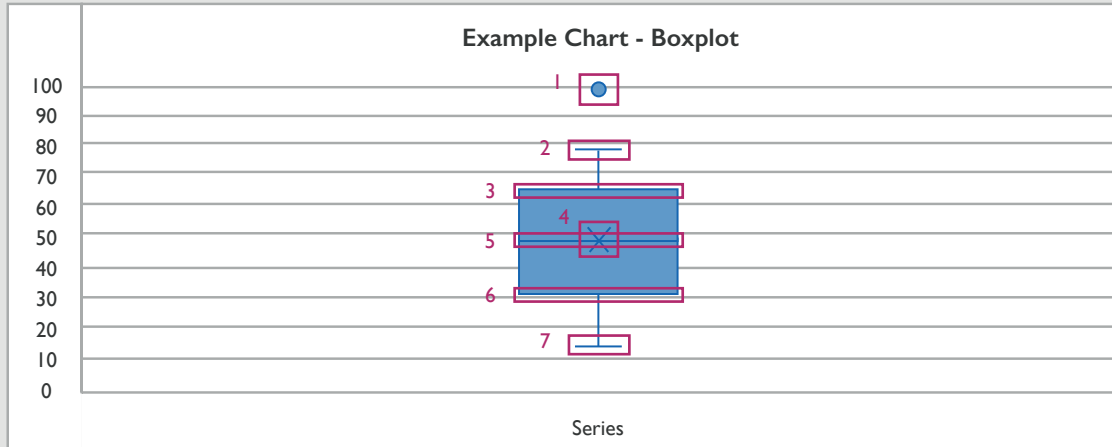
1. **Outliers** - Any dots above or below the min or max lines mark the outlier positions. An outlier is a value 1.5 times the inter-quartile range larger than the third quartile or 1.5 times the inter-quartile range smaller than the first quartile.

2. **Maximum** - The top line marks the maximum value, excluding any outliers.

3. **Upper quartile** - The top of the box marks the sample's upper quartile. The upper quartile denotes the value lying between the third and fourth quartiles of the data set.

4. **Mean** - The cross marks the mean value of the data.

5. **Median** - The line within the box marks the sample's median position. The median denotes the value lying at the midpoint of a set of ordered values.

6. **Lower quartile** - The bottom of the box marks the sample's lower quartile. The lower quartile denotes the value lying between the first and second quartiles of the data set.

7. **Minimum** - The bottom line marks the minimum value, excluding any outliers.

The table under each boxplot provides the total CCG count for each series.

Example Chart - Column Chart
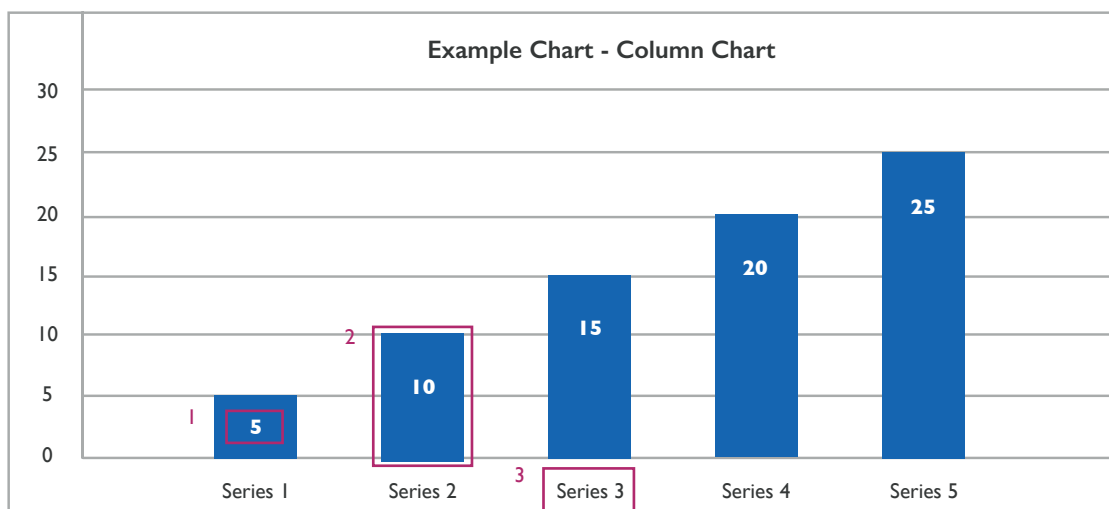
1. **Data label** - The value in each column is the England mean value for the series.

2. **Column** - Each column charts the England mean position for the series.

3. **Series name** - The label underneath the column provides the name of each series. These are commonly ethnicities or deprivation scores.

ADDITIONAL INFORMATION

GLOSSARY AND ACRONYMS

Term	Definition
Abdominal aortic aneurysm (AAA)	A bulge or swelling in the aorta (the main blood vessel running from the heart to the stomach).
Anticoagulation/anticoagulants	Medicines that prevent the blood from clotting as quickly or as effectively as normal.
Antihypertensive drugs	A class of drugs that are used to treat high blood pressure.
Atherosclerotic CVD	A disease in which plaques that are made up of fat, cholesterol, calcium and other substances build up in the walls of arteries.
Atrial fibrillation (AF)	A heart condition that causes an irregular and often abnormally fast heart rate.
Cardiovascular disease (CVD)	A general term for conditions affecting the heart or blood vessels, usually associated with a build-up of fatty deposits inside the arteries and an increased risk of blood clots.
CHA2DS2-VASc	Clinical prediction rules for estimating the risk of stroke in people with atrial fibrillation.
Chronic kidney disease (CKD)	Chronic kidney disease (CKD) is a long-term condition where the kidneys do not work as well as they should.
Clinical Commissioning Group (CCG)	CCGs were created following the Health and Social Care Act in 2012 and commission NHS services in their local areas.
Comorbidity	The simultaneous presence of two or more diseases or medical conditions in a patient.
Coronary heart disease (CHD)	Refers to when the blood vessels supplying the heart are narrowed or blocked.
Dementia	This report refers to vascular dementia – a type of dementia caused by reduced blood flow to the brain.
Deprivation quintile	Small, fixed geographic areas of the UK are measured for relative deprivation and are then classified into five quintiles based on relative disadvantage. Quintile 1 is the most deprived and quintile 5 is the least deprived.
Diabetes mellitus	Commonly known as diabetes, when a person's pancreas does not produce enough insulin to control the amount of glucose in the blood.
Familial hypercholesterolaemia (FH)	An inherited, genetic condition which causes high cholesterol levels in the blood.
General Practice (GP)	The work of a doctor based in the community.
Heart failure (HF)	Refers to when the heart is unable to pump blood around the body properly.
High blood pressure	See hypertension.

ADDITIONAL INFORMATION

GLOSSARY AND ACRONYMS CONTINUED...

Term	Definition
High cholesterol	When a person has too much cholesterol (a fatty substance, a type of lipid) in the blood.
Hyperlipidaemias	Refers to when a person's blood has too many lipids (or fats), such as cholesterol and triglycerides.
Hypertension (also called high blood pressure)	When the pressure in a person's blood vessels is unusually high.
Integrated Care System (ICS)	ICSs are partnerships between the organisations that meet health and care needs across an area of England. In the CVDPREVENT Data and Improvement Tool, Sustainable Transformation Partnership boundaries will be used to approximate ICS boundaries until these become formalised in April 2022.
Lipid-lowering therapy	Used in the treatment of high levels of fats, such as cholesterol, in the blood.
Low density lipoprotein (LDL)	High levels of LDL cholesterol in the blood which increases the risk of heart disease and stroke.
Non-diabetic hyperglycaemia (pre-diabetes)	Refers to raised blood glucose levels which are not high enough to be in the diabetic range.
Peripheral arterial disease (PAD)	The narrowing of the peripheral arteries serving the legs, arms and head.
Prevalence	A measure of the frequency of a disease or health condition in a population at a particular point in time.
Primary Care Network (PCN)	PCNs are groups of GP practices working together with community, mental health, social care, pharmacy, hospital and voluntary services in their local areas.
Quality improvement (QI)	A framework to systematically improve the outcome of care delivered to patients.
Stroke	A condition where the blood supply to part of the brain is cut off.
Transient ischaemic attack (TIA)	Sometimes referred to as a 'mini stroke'. Caused by a temporary disruption in the blood supply to part of the brain.
Urinary tract infection	An infection of the bladder, kidneys or the tubes connected to them.

ADDITIONAL INFORMATION

END NOTES

(1) Excludes patient opt-outs. Refer to **Methodology Annex**, section 7.

(2) Primary Care Domain GPSES, NHS Digital. Business Rules for Patient-level Data Extracts 2019/20 Cardiovascular Disease Prevention Audit. April 2019, V1.9.

(3) For information on audit participation refer to the **Methodology Annex**, section 7 & section 10.

(4) For information on aggregation of data to CCG level refer to the **Methodology Annex,** section 8 & section 9.

(5) Ethnicity data was not available for all patients. The audit plans to work with a range of national partners such as NHS England and NHS Digital to consider means of ensuring better ethnicity coding in primary care in the longer term. Refer to **Methodology Annex**, section 7.

(6) Over-treatment is not covered by the scope of the first report but is expected to be investigated in future iterations of the audit.

(7) NICE. **Guideline NG196. Atrial fibrillation: diagnosis and management**. June 2021.

(8) An assessment of the differences between the Quality and Outcomes Framework (QoF) and CVDPREVENT prevalence is provided in the **Methodology Annex**, section 9.

(9) For methodology for synthetic estimates for age distribution, refer to **Methodology Annex**, section 9.

(10) NICE. **Guideline NG196. Atrial fibrillation: diagnosis and management**. June 2021.

(11) Ethnic groups included within the categories used in the report can be found in the **Methodology Annex**, section 9.

(12) Michelena HI, Ezekowitz MD. 'Atrial Fibrillation: are there gender differences?' The Journal of Gender Specific Medicine. Sep-Oct 2000, 3(6): 44 – 49.

(13) Michelena HI, Ezekowitz MD. 'Atrial Fibrillation: are there gender differences?' The Journal of Gender Specific Medicine. Sep-Oct 2000, 3(6): 44 – 49.

(14) Shen AY, Contreras R, Shah AI, Ichiuji AM, Jorgensen MB, Brar SS, Chen W. 'Racial/ethnic differences in the prevalence of atrial fibrillation among older adults – a cross-sectional study'. Journal of the National Medical Association. Oct 2010, 102(10): 906 – 213.

(15) NICE. **Guideline NG136. Hypertension in adults: diagnosis and management.** Aug 2019.

(16) An assessment of the differences between the Quality and Outcomes Framework (QoF) and CVDPREVENT prevalence is provided in the **Methodology Annex,** section 9.

(17) NICE. **Guideline NG136. Hypertension in adults: diagnosis and management.** Aug 2019.

(18) NICE. **Guideline NG136. Hypertension in adults: diagnosis and management.** Aug 2019.

(19) Groups included in the Asian ethnic group are described in the **Methodology Annex,** section 9.

(20) NICE. **Guideline NG136. Hypertension in adults: diagnosis and management.** Aug 2019.

(21) Public Health England. **Health matters: combating high blood pressure.** Jan 2017.

(22) Lane D, Beevers D, Lip G. 'Ethnic differences in blood pressure and the prevalence of hypertension in England'. Journal of Human Hypertension. 2002, 16: 267 – 273.

(23) Health and Social Care Information Centre. Joint Surveys Unit (2012). **Health Survey for England - 2011, Health, social care and lifestyles.** Table 3.9 [cited 23rd August 2021].

(24) NICE. **Guideline CG71. Familial hypercholesterolaemia: identification and management**. Aug 2008.

(25) NICE. **Guideline CG71. Familial hypercholesterolaemia: identification and management.** Aug 2008.

(26) Only includes-CHD, stroke, Transient Ischaemic Attack, Abdominal Aortic Aneurysm.

(27) NICE. **Guideline CG181. Cardiovascular disease: risk assessment and reduction, including lipid modification**. July 2014.

ADDITIONAL INFORMATION

END NOTES CONTINUED...

(28) NICE. Guideline CG181. Cardiovascular disease: risk assessment and reduction, including lipid modification. July 2014 & NICE. Guideline NG203. Chronic kidney disease: assessment and management. Aug 2021.

(29) Stewart A, Rao J N. 'Asian patients may receive inferior care' BMJ. 2002, 325: 659.

(30) Nitsch D, Caplin B, Hull S, Wheeler D. National Chronic Kidney Disease Audit, National Report (Part 1). Jan 2017.

(31) Nitsch D, Caplin B, Hull S, Wheeler D. National Chronic Kidney Disease Audit, National Report (Part 1). Jan 2017.

(32) NICE. Guideline NG203. Chronic kidney disease: assessment and management. Aug 2021.

(33) An assessment of the differences between the Quality and Outcomes Framework (QoF) and CVDPREVENT prevalence is provided in the **Methodology Annex,** section 9.

(34) Said S, Hernandez GT. 'The link between chronic kidney disease and cardiovascular disease'. The Journal of Nephropathology. July 2014, 3(3): 99 – 104.

(35) Bikbov B, Perico N, Remuzzi G. 'Disparities in Chronic Kidney Disease Prevalence among Males and Females in 195 Countries: Analysis of the Global Burden of Disease 2016 Study' Nephron. May 2018, 139(4): 313 – 318.

(36) It is acknowledged that most of the types of hyperlipidaemia are not diagnosed and therefore this reflects the practice record not a metabolic measure.

(37) NHS Digital (2020). Health Survey for England 2019: Overweight and obesity in adults and children.

(38) NHS Digital (2020). Health Survey for England 2019: Overweight and obesity in adults and children.

(39) NICE. Guideline PH25. Cardiovascular disease prevention. June 2010.

ACKNOWLEDGEMENTS

ACKNOWLEDGEMENTS