

# **Cardiovascular Disease (CVD) needs assessment – epidemiological data review**

**September 2015**

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## **Executive summary**

This document is a high level review of the published epidemiological data on cardiovascular disease (CVD) in Gloucestershire. It has been produced to improve understanding of population health need and inform the work of the Circulatory CPG.

Gloucestershire has seen a *fall in early deaths from CVD over the last decade* at both county and district level (mirroring the national trend); and the rate of premature mortality from CVD remains significantly lower than the national average (PHOF). The *highest rate of premature mortality from CVD in both men and women is in Gloucester district*, which may be partly explained by population risk factors, including deprivation and above average rates of obesity and diabetes. While the overall trend is downward, there are signs of a *slight increase in premature mortality from CVD in Cheltenham and Tewkesbury*, which merits further monitoring.

Studies suggest that nationally the fall in CVD mortality has been due to changes in population lifestyle behaviours and medical treatments, notably the *prescribing of statins and ARBs/ACE-inhibitors for secondary prevention* (Bajekal et al, 2012). This highlights the potential gains from optimising CVD management in primary care. *Hypertension has been identified as the leading risk factor* contributing to the overall disease burden from CVD in the UK, exceeding the contribution from factors such as high BMI, high cholesterol and tobacco smoking (Murray et al 2013).

Research suggests that national progress in addressing CVD is being *negated by increases in BMI and diabetes* (Bajekal et al, 2012). While the county is not an outlier for either condition; prevalence does vary across localities which is likely to be reflected in health outcomes.

Gains in premature mortality from CVD are not necessarily experienced by all sectors of the population. *Economic disadvantage, mental ill-health and ethnicity can increase the likelihood of an individual developing CVD and dying prematurely*. These same factors can act as a barrier to individual's accessing services increasing the likelihood of missed or late diagnosis. Notably, CVD is the *primary contributor to the life expectancy gap in the county*.

While recorded prevalence rates of CHD and stroke in Gloucestershire have been relatively stable since 2009/10, the county's *ageing population is likely to mean increasing prevalence of CVD over time*. Based on QOF registers (13/14), *CCG wide recorded prevalence of CHD is significantly lower than the national average; and stroke prevalence is significantly higher* (likely to reflect the county's older age profile) (QOF).

CHD and stroke prevalence is *significantly above the CCG average in the Forest of Dean and North Cotswold localities*. While locality variation is likely due to differences in age profiles and detection rates; it may be worthy of further exploration. *Recorded prevalence of CHD in*

*all practices is below estimates of actual prevalence*, suggesting that a proportion of CHD cases in the county may be undiagnosed and/or unrecorded. Under-diagnosis of CVD (and associated clinical risk factors) has been cited as a national issue (Soljak et al 2012) highlighting the importance of case finding.

The CCG recorded *prevalence of hypertension, CKD and AF is significantly higher than the national average* (QOF 13/14) - again likely due to the county's older population. Diabetes prevalence is lower than the national average (though Forest of Dean and Gloucester localities have recorded prevalence above the CCG average). Local prevalence of *CKD is increasing at a faster rate than the national average*, which merits further exploration.

There is *significant variation in prevalence of clinical risk factors at the locality and practice level, notably in hypertension and diabetes*. Again *recorded prevalence is likely to be an under-estimation* of true prevalence. CCG wide, modelled estimates suggest that 47% of hypertension cases and 33% of AF cases are undetected.

Studies support the importance of secondary prevention in primary care for improving patient outcomes (Bajekal et al, 2012). Overall compared to the national and cluster average, *Gloucestershire benchmarks well against relevant CVD QOF indicators*; however there may be scope for improvement when compared to the best performing CCGs in the cluster. There is also practice variation in performance, for example with respect to secondary care of patients with a history of MI and the prescribing of statins.

Current data suggests scope to increase: the proportion of eligible patients who are invited for an *NHS Health Check and uptake levels*; the proportion of obese patients *referred to the local Weight Management service*; and *referrals to smoking cessation support* (with a particular focus on those practices with high smoking prevalence).

Circulatory conditions were the third highest area of spend for Gloucestershire CCG in 13/14; with *unscheduled/non-elective admissions accounting for a third of expenditure*. Compared to its ONS cluster group, spend on community and integrated care is notably lower.

Further data is needed to analyse secondary care activity for CVD in the county; including trends in admissions and referrals. Indicators in the CCG outcome framework suggest scope for *improvement in the stroke care pathway*. The CCG has put an action plan in place with Gloucestershire Hospitals Trust to address this.

## **Recommendations**

While this is only a partial needs assessment, some initial recommendations have been included for consideration:

- Consider undertaking a deep dive in conjunction with localities and practices to better understand trends in **variation**; focused on optimising:
  - o CVD and risk factor management within primary care (guided by the findings of the Commissioning for Value benchmark analysis).
  - o Detection rates of CVD and clinical risk factors.
  - o Patient outcomes.
- Consider options for improving **case finding** of patients with previously undiagnosed CVD or relevant clinical risk factors (both in health care settings; and the community); including:
  - o Reviewing the findings of delivery of NHS Health Checks across primary care in conjunction with Public Health commissioners.
  - o Consideration of community outreach (linked to the Health Check programme) to identify people who may not routinely access services and groups at higher risk of CVD.
  - o Integrated assessments of CVD patients within secondary care to ensure that other circulatory conditions are detected.
- Work with Public Health to ensure that actions to address inequalities in health outcomes for patients with or at risk of CVD are incorporated into the countywide **Health Inequalities Plan**.
- Work with Public Health commissioners to embed **support to make lifestyle changes** in primary and secondary care pathways for patients with CVD or at risk of CVD, including:
  - o Incorporating referral mechanisms to locally commissioned services, such as the weight management on referral service and smoking cessation service;
  - o Providing health professionals with the information and skills to deliver brief advice and interventions and/or signpost to appropriate support.
- Undertake further work with CCG Finance and Information team to **analyse long term secondary care activity data**. This should focus on understanding trends and variation in referrals and admissions; and benchmarking activity with comparator CCGs. Control limits should be attached to the data to help identify natural variation.
- Consider **qualitative research** to better understand service user and stakeholder views on current services/care pathways. This should include capturing the views of people who may not currently be accessing services, but may be in 'need' of them.

- Consider a **focused evidence review** looking at relevant evidence on 'what works' with respect to different aspects of CVD care and prevention, such as case finding, treatment adherence etc.
- Consider further work to assess population health need arising from **other circulatory conditions**, such as abdominal aortic aneurysm, vascular dementia, and peripheral arterial disease.

## Section 1: Introduction

### Purpose

1.1 This document presents the findings of a high level review of the national and local data on cardiovascular disease (CVD). It has been produced to improve understanding of population health needs in Gloucestershire and inform the work of the Circulatory Clinical Programme Group (CPG).

1.2 In order to complete a comprehensive needs assessment, it is recommended that this review is supplemented with data on current service provision and usage; and qualitative information on the views of stakeholders and service users.

### Scope

1.3 This assessment adopts the same scope as the Circulatory CPG; which focuses on all aspects of the cardiovascular disease (CVD) care pathway from prevention through to end of life care for adults with or at risk of the disease.

1.4 CVD is an 'overarching term that describes a family of diseases sharing a common set of risk factors'.<sup>1</sup> The CPG largely focuses on conditions causing or resulting from atherosclerosis, in particular Coronary Heart Disease (CHD) and stroke; but also has links to other relevant clinical areas including Chronic Kidney Disease (CKD), diabetes, vascular dementia and peripheral arterial disease.<sup>2</sup> The later conditions are not looked at in detail in this report; but relevant data is provided where appropriate.

### Note on data sources

1.5 This report largely draws on published data sources, including the Public Health Outcomes Framework (PHOF), Health and Social Care Information Centre (NHSIC) (which incorporates indicators in the CCG Outcome Framework) and the PHE Practice Profiles, which incorporate QOF data. While there are good published sources of mortality and morbidity data available at the local level on the most prevalent circulatory conditions, CHD and stroke; there is relatively little local data available on other circulatory conditions, such

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<sup>1</sup> DH (2013) strategy p.10

<sup>2</sup> Circulatory Clinical Programme, Programme Brief, December 2014.

as vascular dementia and Abdominal Aortic Aneurysm (AAA). For this reason, the report mainly focuses on CHD and stroke.

## **Section 2: National context – what is the national disease burden from CVD?**

2.1 This section presents data on the national picture with respect to the disease burden from CVD.

### **Burden of CVD –prevalence rates**

2.2 The estimated prevalence of CVD (among people aged 16 and over) in England in 2011 was 9.5%; equivalent to an estimated 4.9 million people living with CVD.<sup>3</sup> Estimated prevalence is slightly higher in men (aged 16 plus) compared to women (12% and 11.5% respectively). Evidence also suggests that men are more likely to develop CVD at an earlier age.

2.3 Table 1 shows the recorded national prevalence (taken from QOF disease registers) of CHD, heart failure, stroke and atrial fibrillation. It also includes the estimated actual prevalence, where modelled. The gap between recorded prevalence and actual prevalence provides an indication of the number of undiagnosed cases (Soljak et al 2011)<sup>4</sup>. Nationally, it is estimated that 72.3% of CHD cases are detected and 82.7% of stroke cases.<sup>5</sup> Late or missed diagnosis may have implications for patient outcomes.

**Table 1: CVD prevalence by condition**

Sources: CVD profiles, NCVIN 2014, PHE Practice Profiles.

Recorded prevalence by condition	Recorded prevalence (QOF)	Estimated prevalence
CHD	3.3%	4.7%
Stroke	1.7%	2%
Atrial Fibrillation	1.5%	n/a
Heart failure	0.7%	n/a

<sup>3</sup> [Modelled estimate of prevalence of CVD in England](#), East of England PHO, December 2011.

<sup>4</sup> Soljak et al (2011) Variations in CVD under diagnosis in England: national cross-sectional spatial analysis, BMC Cardiovascular disorders, 11(12).

<sup>5</sup> PHE Practice profiles

2.4 Incidence data compiled by the British Heart Foundation estimates that there are around 125,000 strokes a year in England and 82,000 heart attacks.<sup>6</sup>

### Burden of CVD – deaths and disability.

2.5 Mortality from CVD has been falling since the early 1970s<sup>7</sup>. Between 2001 and 2010, all age mortality rates from all cardiovascular diseases in England decreased by 36%; while mortality rates in under 75s decreased by 40%.<sup>8</sup> The majority of deaths from CVD are due to coronary heart disease and cerebrovascular disease, including stroke and TIA.

2.6 Research suggests that the fall in CVD mortality can be attributed to a combination of medical treatments, specifically secondary prevention in primary care, and changes in lifestyle behaviours (Unal et al 2003<sup>9</sup>).

2.7 Bajekal et al (2012)<sup>10</sup> suggest that approximately 52% of the total fall in CHD mortality between 2000 and 2007 in England could be attributed to improved uptake of treatments, and 34% to changes in population level risk factors. The most substantial contribution came from secondary prevention in the community following MI or revascularisation, and care for patients with chronic stable coronary heart disease. Collectively statin therapy and ACE-inhibitors or ARBs contributed to 17% of the total fall in mortality; underlining the importance of optimising CVD management in primary care. The contribution of medical interventions in hospital was relatively modest.

2.8 Of the deaths prevented due to changes in population level risk factors, the largest contribution (29%) came from a fall in systolic blood pressure amongst those *not* on hypertensive medications; gains from hypertensive medications (5%) were relatively modest. This suggests the importance of supporting non-medical interventions to reduce blood pressure, such as dietary changes (Mohan and Campbell 2009).<sup>11</sup> In contrast the benefits attributable to statin lowering of total cholesterol levels were double those attributable to the fall in cholesterol levels among those not on treatment; suggesting that medical intervention is more effective for some conditions. The proportion of the fall in mortality (8%) attributable to reduced smoking, and increases in physical activity and fruit and vegetable consumption, was relatively modest; moreover the mortality gains were found to have been partially offset by increases in BMI and diabetes prevalence (Bajekal et al 2012).

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<sup>6</sup> BHF 2012 compendium

<sup>7</sup> CVD profile, PHE

<sup>8</sup> NHS Information Centre data cited in DH(2013) pp.12-13.

<sup>9</sup> Unal et al (2003) Explaining the decline in CHD mortality in England and Wales between 1981 and 2000, Circulation; 109.

<sup>10</sup> Bajekal et al (2012) Analysing recent socio-economic trends in CHD mortality in England, 2000-2207: A population modelling study, PLoS medical 9(6).

<sup>11</sup> Mohan and Campbell (2009) Hypertension management, Hypertension, 53, pp.450-451

2.9 Despite the overall decrease in deaths from CVD they still account for around a third of deaths nationally per annum<sup>12</sup>. Heart disease and stroke are ranked as the first and the third leading causes of premature mortality in the UK.<sup>13</sup> Moreover as noted above, there is evidence to suggest that factors such as an ageing population, increased BMI and increased prevalence of diabetes, could lead to the loss of previous gains in mortality rates from CVD.<sup>14</sup>

2.10 Data from the 2010 Global Burden of Disease study shows that the UK still has premature mortality rates from CHD which are significantly above the mean for its international comparator group<sup>15</sup>; with the UK ranked 14<sup>th</sup> out of 19 countries (1 represents the best performing country, in this instance France) (Murray et al 2013).<sup>16</sup> The UK ranks 13<sup>th</sup> out of 19 for premature mortality from stroke, in line with the group average. Both scores indicate scope for improvement in health outcomes. The corresponding analysis of risk factors in the same study identifies hypertension as the leading cause of the burden of disease attributable to CVD in the UK; the implication being that improved early detection and effective management of high blood pressure should result in improved health outcomes (Murray et al 2013; Mohan et al 2009; Falaschetti et al 2009).

2.11 Nationally, almost two thirds<sup>17</sup> of premature deaths from CVD are classed as preventable. A death is considered preventable if, in the light of understanding of the determinants of health at time of death, the death could have been avoided by public health interventions in the broadest sense. While this highlights the importance of addressing population risk factors, such as hypertension, smoking and diet, evidence on the factors behind the fall in premature mortality from CVD, discussed at 2.7, suggest that to have the greatest impact public health interventions need to be combined with treatment interventions where appropriate (Bajekal et al 2012).

2.12 Cardiovascular disease can have an impact on quality of life and cause considerable disability, with implications for social care provision. The proportion of disability associated with cardiovascular and circulatory diseases increases with age, with the greatest burden in those aged 80 plus.<sup>18</sup> Stroke is cited as one of the largest causes of adult disability in England. A 2010 report by the National Audit Office estimated that nationally around 300,000 people are living with moderate to severe disabilities as a result of stroke.<sup>19</sup>

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<sup>12</sup> DH (2013) p.13

<sup>13</sup> [GBD \(2010\)](#)

<sup>14</sup> DH (2013) p.13

<sup>15</sup> High income countries with similar or higher levels of health expenditure: the original 15 EU countries plus Australia, Canada and the USA

<sup>16</sup> Murray et al (2013) UK Health Performance: findings of the Global Burden of Disease Study 2010, *The Lancet* 381; 997-1020.

<sup>17</sup> Public Health Outcome Framework

<sup>18</sup> Murray et al (2013)

<sup>19</sup> NAO (2010) Progress in improving stroke care

## Burden of CVD – hospital admissions

2.13 UK wide, there were 1.6 million hospital admissions related to CVD in 2012/13<sup>20</sup>, accounting for 10% of all inpatient episodes among men, and 6.2% among women. NICE estimate that more than 50% of hospital admissions for CVD in 2010/11 were as an emergency (likely to be largely due to heart attacks and stroke), and around 60% were for those aged under 75.<sup>21</sup> The later suggests that despite the relationship between increasing age and CVD; a sizeable proportion of CVD is occurring in younger age groups. This may be due to exposure to lifestyle risk factors from a younger age.

## Costs associated with CVD

2.14 NHS England Programme Budgeting data indicates that £6.9 billion was spent on treating CVD within the NHS in England in 2012/13; of which 63% was spent within secondary care and 21% within primary care. Within secondary care, the highest expenditure was on non-elective inpatient admissions i.e. emergency admissions. Almost all the costs in primary care were attributable to primary prescribing. Trend data shows that while NHS expenditure on circulatory conditions as a whole increased between 2003/04 and 2009/10 from £5.42 billion to £7.17 billion; in recent years it has seen a slight decline. However across the programme budgeting categories, expenditure on circulatory problems still remains the second largest area of spend after mental health disorders.

2.15 In addition to the direct costs to the NHS, there are a number of indirect costs arising from CVD, including those related to loss of productivity; and the informal provision of care for people with the disease. Data collated by the British Heart Foundation suggests that in 2009 production losses arising from CVD in people of working age cost the UK economy over £6 billion; while the cost of informal care for people with CVD was estimated at £3.8 billion in 2009; of which £1 billion went on care for people with stroke.<sup>22</sup>

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<sup>20</sup> BHF CVD stats

<sup>21</sup> CVD is here defined in terms of the following ICD-10 codes: All ICD0-10 codes in Chapter IX- Diseases of the circulatory system (100-199) – cited in NICE (2012) Services for the prevention of cardiovascular disease.

<sup>22</sup> Townsend et al (2012) CHD statistics 2012 edition, British Heart Foundation.

## Section 3: How prevalent are the main risk factors for CVD in the Gloucestershire population?

3.1 An understanding of the risk factors for CVD can help with targeting primary and secondary prevention. This section presents information on the major risk factors for CVD and considers how prevalent these risk factors are in the Gloucestershire population to help identify areas or communities where 'need' may be higher and where it may be appropriate to develop more targeted interventions.

### Summary of risk factors for CVD

3.2 So-called 'fixed' risk factors for CVD include:

- **Increasing age:** Incidence, prevalence and mortality rates from CVD all increase with age; with the highest prevalence in people over the age of 60. Research suggests that the average age of first stroke in the UK is 77 years in women, and 71 years in men.<sup>23</sup>
- **Gender:** The overall incidence of both myocardial infarction and stroke is higher in men than women (about 25% higher in the case of stroke<sup>24</sup>). Men are also more likely to develop CVD at an earlier age than women (on average ten years earlier<sup>25</sup>) and are more likely to die prematurely as a result. Reasons for this are complex, but are likely to relate to a combination of behavioural, psycho-social and genetic factors.
- **Ethnicity:** South Asians have increased risk of heart disease and stroke compared to Europeans; and a higher prevalence of type 2 diabetes. People of African Caribbean ethnicity have a significantly lower risk of heart disease; however their risk of stroke is higher, particularly in women. Prevalence of type 2 diabetes and hypertension is also higher among African Caribbeans.<sup>26</sup>
- **Family history:** Risk of CVD increases if a first degree blood relative has had coronary heart disease or stroke before the age of 55 years (for a male relative) or 65 years (for a female relative). Familial hypercholesterolaemia (FH) is a specific genetic risk factor for CVD. NICE have made a number of recommendations for improving diagnosis and treatment of FH<sup>27</sup>, including the introduction of cascade testing for

<sup>23</sup> <http://bmjopen.bmjjournals.org/content/1/2/e000269.full>

<sup>24</sup> BHF 2012 compendium

<sup>25</sup> BHF 2008

<sup>26</sup> Chaturvendi (2003) Ethnic differences in cardiovascular disease, Heart, 89, pp.681-686.

<sup>27</sup> NICE CG71 (2008)

families diagnosed with the condition. A cascade testing service will be introduced in Gloucestershire in November 2015.

### 3.3 The key lifestyle or behavioural risk factors for CVD are:

- **Smoking** – tobacco is estimated to account for 13% of CVD deaths.<sup>28</sup> CHD mortality is around 60% higher in smokers than non-smokers<sup>29</sup>;
- **Physical inactivity** – moderate physical activity is associated with a 10% reduction in risk of CHD, a 20% lower risk of stroke; and a 33%-50% reduced risk of diabetes<sup>30</sup>;
- **Diet** – specifically low consumption of fruit and vegetables; and increased consumption of high fat, sugar and salt foods (HFSS).
- **High BMI (overweight and obesity)** – obese men ( $BMI \geq 30$ ) are up to two and half times more likely to develop high blood pressure; and obese women are four times more likely<sup>31</sup>.
- **Excess alcohol consumption** – intake above DH recommended levels associated with a two-fold increased risk of stroke in men; and a four-fold increased risk in women.<sup>32</sup>

### 3.4 The main physiological/metabolic risk factors for CVD are:

- hypertension
- raised cholesterol/disordered lipids;
- Impaired glucose tolerance/diabetes – risk of CVD is estimated to be between 5 and 8 times higher in middle aged diabetics<sup>33</sup>; and
- Chronic Kidney Disease (CKD).

Atrial Fibrillation (AF), a heart condition which can result in an irregular or fast pulse, is also a risk factor for stroke; and untreated can lead to heart failure.

3.5 There is some evidence to suggest that physiological risk factors for CVD are going undiagnosed (Soljak et al 2011; DH 2013). Modelled data cited by the Department of Health estimates that nationally 31% of CKD cases, 18% of AF cases, and 25% of type 2 diabetes cases remain undiagnosed<sup>34</sup>. It is also estimated that only 54% of people with hypertension are recorded on QOF disease registers.<sup>35</sup> The implication of under diagnosis is that opportunities for early intervention may be missed. This is important since metabolic changes may be reversible in their early stages and can in most cases be managed effectively in primary care.

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<sup>28</sup> ASH 2008 cited in NICE 2010 25

<sup>29</sup> BHF 2012 compendium

<sup>30</sup> CMO 2009

<sup>31</sup> Govt Obesity strategy

<sup>32</sup> Department of Health (2009)

<sup>33</sup> Diabetes UK <http://www.diabetes.co.uk/diabetes-complications/heart-disease.html>

<sup>34</sup> DH CVD strategy

<sup>35</sup> Practice profiles

## Vulnerable population and health inequalities

3.6 In addition to the risk factors summarised above, there are a number of other factors which can increase the likelihood of an individual developing CVD and dying prematurely as a result, including economic disadvantage, mental ill-health and ethnicity. These same factors can also act as a barrier to individual's accessing services and treatment. It is recommended that uptake and accessibility of local services across population groups is explored through the service mapping. Any planned qualitative research should also take into account not just the views of service users, but also those who may not currently access services despite having a 'need' for them.

3.7 There is evidence of a link between deprivation and CVD; with more deprived areas experiencing higher incidence and mortality rates than less deprived areas.<sup>36</sup> Research suggests that premature death rates from CVD are up to six times higher among lower socio-economic groups than more affluent groups<sup>37</sup>. Indeed circulatory diseases are one of the primary contributors to the life expectancy gap nationally.

3.8 One explanation for the link between CVD and deprivation is that the main lifestyle risk factors for CVD; smoking, poor diet, low levels of physical activity and excess alcohol consumption tend to be more prevalent in areas of deprivation. Research by the King's Fund found that clustering of unhealthy behaviours was more common in people from lower socio-economic and educational groups. People with no qualifications, for example were more than five times as likely as those with higher education to engage in all four 'risk' behaviours (smoking, drinking, poor diet and low activity).<sup>38</sup> This underlines the importance of targeted prevention. Evidence of 'clustering' in Gloucestershire is discussed at 3.26.

3.9 Some population groups are also more likely to experience poorer health outcomes as a result of CVD. Mortality and morbidity from CVD are higher among those with mental health conditions; even after controlling for socio-economic variables.<sup>39</sup> Individuals with psychosis, such as schizophrenia or bipolar disorder, have an approximately 2-3 fold increased risk of death and disability due to CVD; with the risk, 3.6 times higher in younger individuals with severe mental illness, compared to a 2 fold increase in those over 50.<sup>40</sup> The higher risk is

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<sup>36</sup> Marmot and DH (2013)

<sup>37</sup> O'Flaherty et al 2009 cited in NICE 2010 guidance 25

<sup>38</sup> Buck & Frosini (August 2012) Clustering of unhealthy behaviours over time: implications for policy and practice, The King's Fund.

<sup>39</sup> Marmot

<sup>40</sup> Brown et al (2010) and Osborn et al (2007) cited in Holt, R. (2011) Cardiovascular disease and diabetes in people with severe mental illness: causes, consequences and pragmatic management, PCCJ Practice Review.

attributed to both lifestyle behaviours and use of anti-psychotic medication which can increase the likelihood of metabolic syndrome (a predictor for type 2 diabetes and CVD).<sup>41</sup>

3.10 Depression has also been associated with a four-fold increase in the risk of CVD; and a greater likelihood of poor adherence to medication regimes.<sup>42</sup> Depression can also follow a diagnosis of CVD. The prevalence of post stroke depression for example, is estimated to be as high as 60%.<sup>43</sup>

3.11 There are also inequalities related to race and ethnicity. As discussed, risk of CVD is higher among certain ethnic groups (see 2.19); however research also indicates that CVD prevalence and premature mortality from CVD has not fallen as fast in South Asian and African Caribbean populations as it has in the rest of the population.<sup>44</sup>

### **Gloucestershire population profile- age, ethnicity and deprivation**

3.12 Risk of CVD increases with age. In Gloucestershire there is already a significant proportion of the population aged over 65; and this trend is projected to continue as a result of rising life expectancy. Between 2011 and 2021 the county is projected to see 27.3% growth in those aged 65 plus; and 36% growth in those aged 85 and over.<sup>45</sup> An ageing population is likely to result in more people living with a range of long term conditions alongside CVD; highlighting the need to consider the health and social care needs of patients with co-morbidities.

3.13 The age profile of the county varies by district with the more urban localities, such as Gloucester tending to have a younger demographic. In 2011, Cotswold district, Forest of Dean district and Tewkesbury district had the highest *proportion* of people aged 65 plus. The highest *number* of over 65s was in Gloucester district. The fastest rate of growth in over 65s through to 2021 is projected to occur in Stroud, Tewkesbury and the Forest of Dean.<sup>46</sup> It is reasonable to assume that the proportion of older people living with CVD in these areas is likely to increase.

3.14 The age profile of the registered population shows a similar picture (figure a, appendix b). Data from the general practice profiles indicate that 19.7% of the GP registered population in Gloucestershire is 65 and over, compared to an England average of 16.9%.<sup>47</sup> Figure 1 shows the variation in prevalence and number of registered patients in this age cohort across the seven CCG localities. While the *highest prevalence* is in the N Cotswold,

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<sup>41</sup> [http://www.guidelines.co.uk/dec\\_11\\_dollery\\_mental\\_health\\_dec11](http://www.guidelines.co.uk/dec_11_dollery_mental_health_dec11)

<sup>42</sup> DH 2013

<sup>43</sup> DH 2013

<sup>44</sup> Chaturvendi (2003); BHF 2008

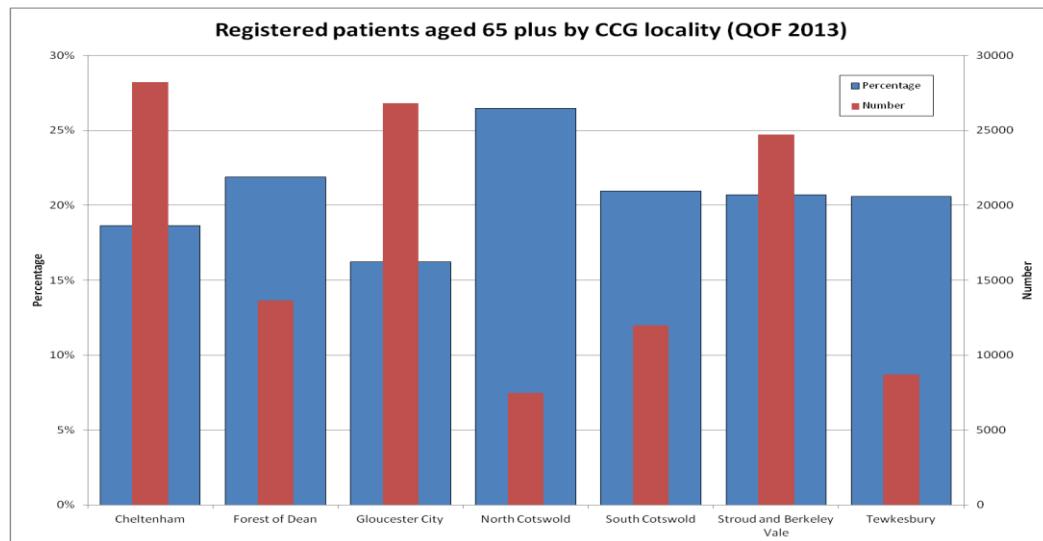
<sup>45</sup> ONS 2011 based interim projections

<sup>46</sup> ONS-2011- based interim projections- Gloucestershire

<sup>47</sup> PHE Practice profiles, 2014

the highest *number of patients* aged 65 and over are seen in the more populated localities of Cheltenham, Gloucester City and Stroud & Berkeley Vale.

**Figure 1:**



3.15 The relative risk of developing CVD varies across ethnic groups. Gloucestershire has a small Black and Minority Ethnic (BME) population (4.6%) compared to England (14.1%); however there are variations between districts, with Gloucester having the highest BME population (10.9%).<sup>48</sup> Overall, 1.5% of the county population is of mixed ethnicity; 2.1% Asian ethnicity and 0.9% Black/Black British.

3.16 Lower socio-economic status is also associated with a greater risk of CVD (see 2.29).

3.17 Overall Gloucestershire is a relatively affluent county however analysis of the Indices of Multiple (IMD 2010) shows that there are pockets of deprivation. In terms of overall deprivation rankings the county has eight neighbourhoods (Lower Super Output Areas) all in Gloucester and Cheltenham, which are amongst the *most deprived 10%* of neighbourhoods in England. The eight neighbourhoods are home to 12,698 residents.

Figure b (appendix b) shows the deprivation scores for individual General Practices in Gloucestershire. In common with the IMD data at district level, the practices with the highest deprivation scores are in Gloucester locality; followed by Cheltenham and the Forest of Dean. In the case of the later, all practices in the locality save one have deprivation scores above the CCG average.

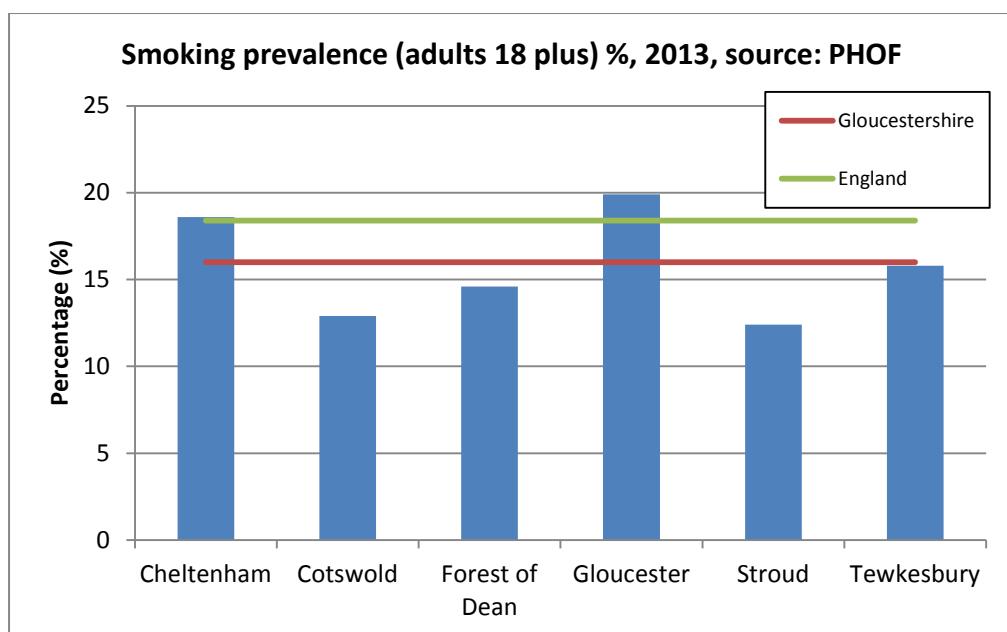
<sup>48</sup> Census 2011, ONS

## Gloucestershire prevalence of lifestyle risk factors for CVD

### Smoking

3.18 Overall the prevalence of smoking in Gloucestershire is significantly lower than the national average (16% compared to 18.4%); however smoking rates vary between districts (figure 2) (rising to 19.9% in Gloucester) and by occupational group. Smoking rates among those working in routine and manual professions in the county rise to 45.7% in Cheltenham, significantly above the national average.<sup>49</sup>

**Figure 2:**



3.19 QOF includes data on estimated smoking prevalence by practice. This highlights variation in smoking rates between practices with prevalence rising to over 30% in three practices (figure c, appendix b); compared to an average across all practices of 17%.

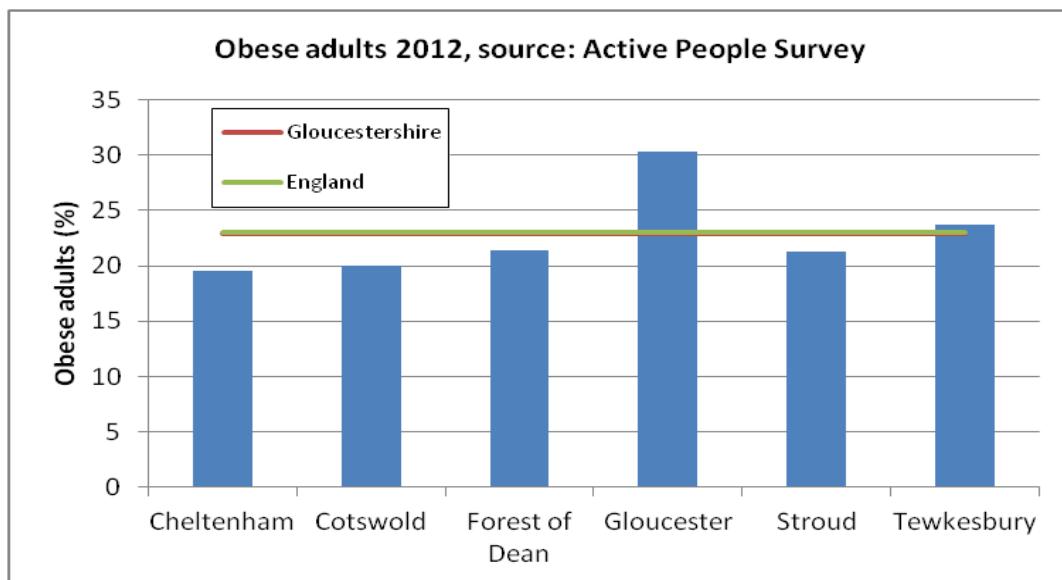
### Obesity

3.20 Poor diet and high BMI are key risk factors for CVD. Robust data on dietary intake (such as consumption of fruit and vegetables) at the local level is limited; however there are estimates available for levels of obesity. Data from the Active People Survey 2012 indicates that while the county prevalence of obesity ( $BMI \geq 30$ ) (22.9%) is in line with the national

<sup>49</sup> Integrated Households Survey 2013; PHOF, Public Health England

average; the prevalence of obese adults in Gloucester district (30.3%) is significantly higher than the national average (figure 3).<sup>50</sup>

**Figure 3:**



3.21 According to 2013/14 QOF data, there were 47,345 GP patients (aged 16 plus) on the obesity register (giving a prevalence of 9.2%).<sup>51</sup> This is likely to represent only around half of the total number of adults with obesity in the county. Figure d (appendix b) shows the variation in recorded obesity by practice. The practices with the highest recorded levels of obesity are in Gloucester and the Forest of Dean; though it should be noted that some of the variation will reflect differences in recording practises.

### **Physical activity**

3.22 National data from the Active People Survey indicates that 26.9% of adults in Gloucestershire (aged 16 plus) (more than one in four) can be classified as 'inactive' (doing less than 30 minutes moderate intensity activity a week); below the national average of 28.9%.<sup>52</sup>

3.23 Gloucester district has the lowest percentage of adults in the county (48.1%) reaching the recommended levels of physical activity for 'good' health (150 minutes of moderate

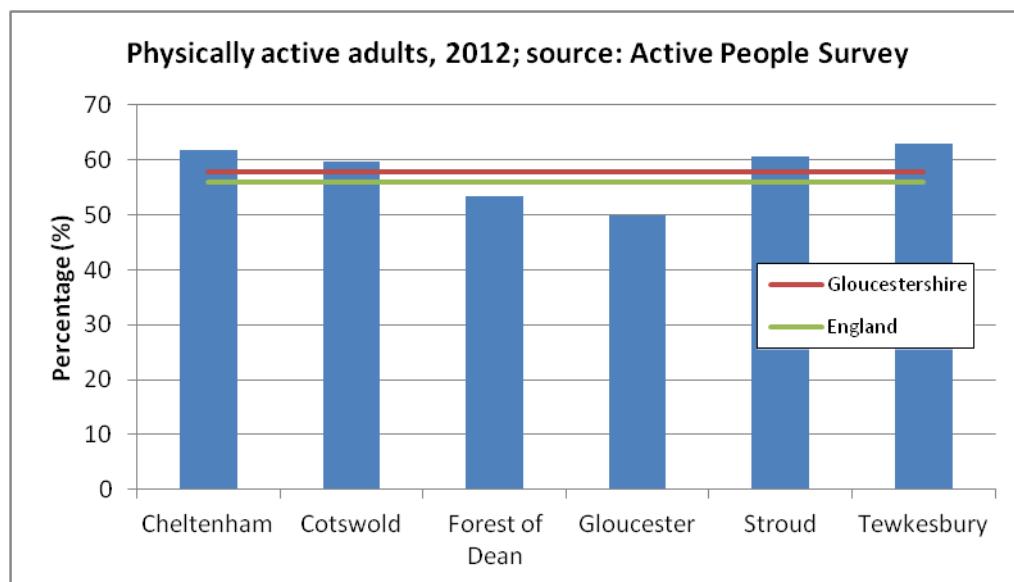
<sup>50</sup> APHO (2014)

<sup>51</sup> NHS Information Centre

<sup>52</sup> Active People Survey 2013, cited in Public Health Outcomes Framework.

intensity activity a week); significantly below the national average and the lowest for a local authority area in the South West (figure 4).<sup>53</sup>

**Figure 4:**



#### Alcohol intake

3.24 The NICE 'Alcohol Services: Commissioning and Benchmarking tool' estimates that 24.2% of the population (aged 16 plus) are likely to be drinking at hazardous levels, and 3.8% at harmful and dependent levels. In Gloucestershire, this would equate to approximately 119,700 and 18,800 adults respectively.<sup>54</sup>

3.25 Alcohol related hospital admissions are typically used as a proxy for the prevalence of alcohol harm.<sup>55</sup> Overall admissions in Gloucestershire are similar to the national average, however rates in Gloucester and Cheltenham are significantly higher (figure 5).

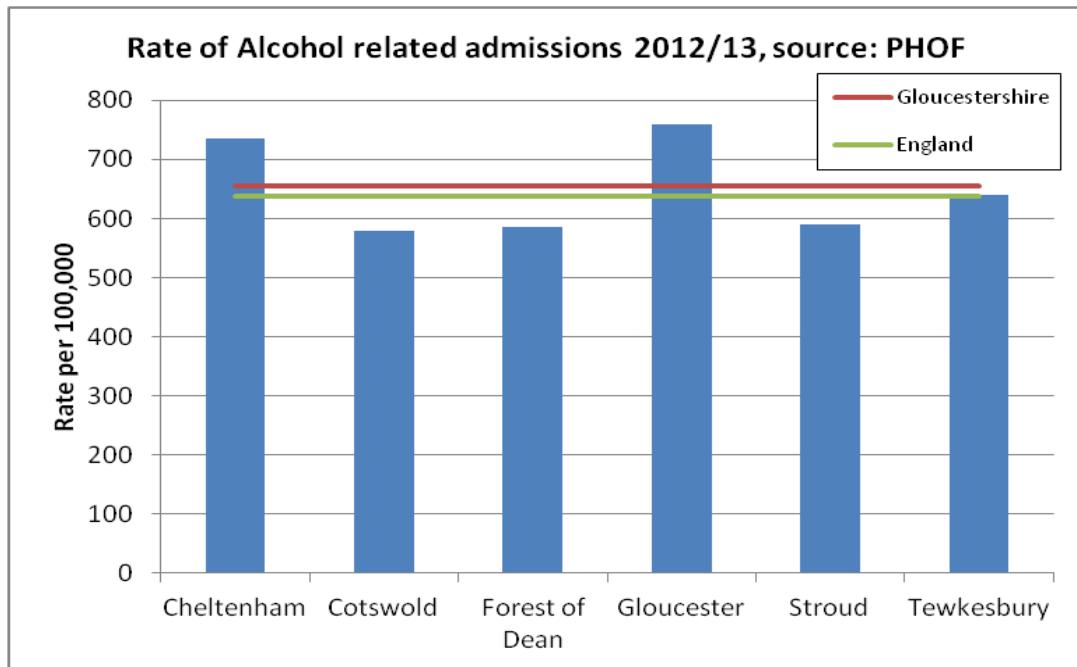
<sup>53</sup> Ibid.

<sup>54</sup> NICE (2011) Alcohol Services: Commissioning and Benchmarking tool, London.

<http://www.nice.org.uk/guidance/ph24/resources/services-for-the-identification-and-treatment-of-hazardous-drinking-harmful-drinking-and-alcohol-dependence-in-children-young-people-and-adults4>

<sup>55</sup> The alcohol related hospital admissions indicator in the Public Health Outcome Framework includes admissions involving an alcohol related primary diagnosis or an alcohol related external cause (rate per 100,000 population, age standardised).

**Figure 5:**



### Clustering of lifestyle risk factors for CVD

3.26 Research shows that people often have more than one lifestyle/behavioural risk factor and this 'clustering' of risk factors is more common among people on lower incomes.<sup>56</sup> Presence of multiple risk factors is associated with a higher risk of CVD.<sup>57</sup>

3.27 In order to look at the issue of clustering in Gloucestershire, the County Council Strategic Needs Analysis Team has created a bespoke mapping tool. The tool uses a number of selected indicators to provide a composite 'healthy lifestyle' ranking for Gloucestershire wards based on combining individual ward rankings for three separate lifestyle behaviours: smoking, obesity and excess alcohol consumption (note: no robust indicator was identified for physical activity at ward level). The rankings are derived from indicators taken from national data sets and Acorn<sup>58</sup>.

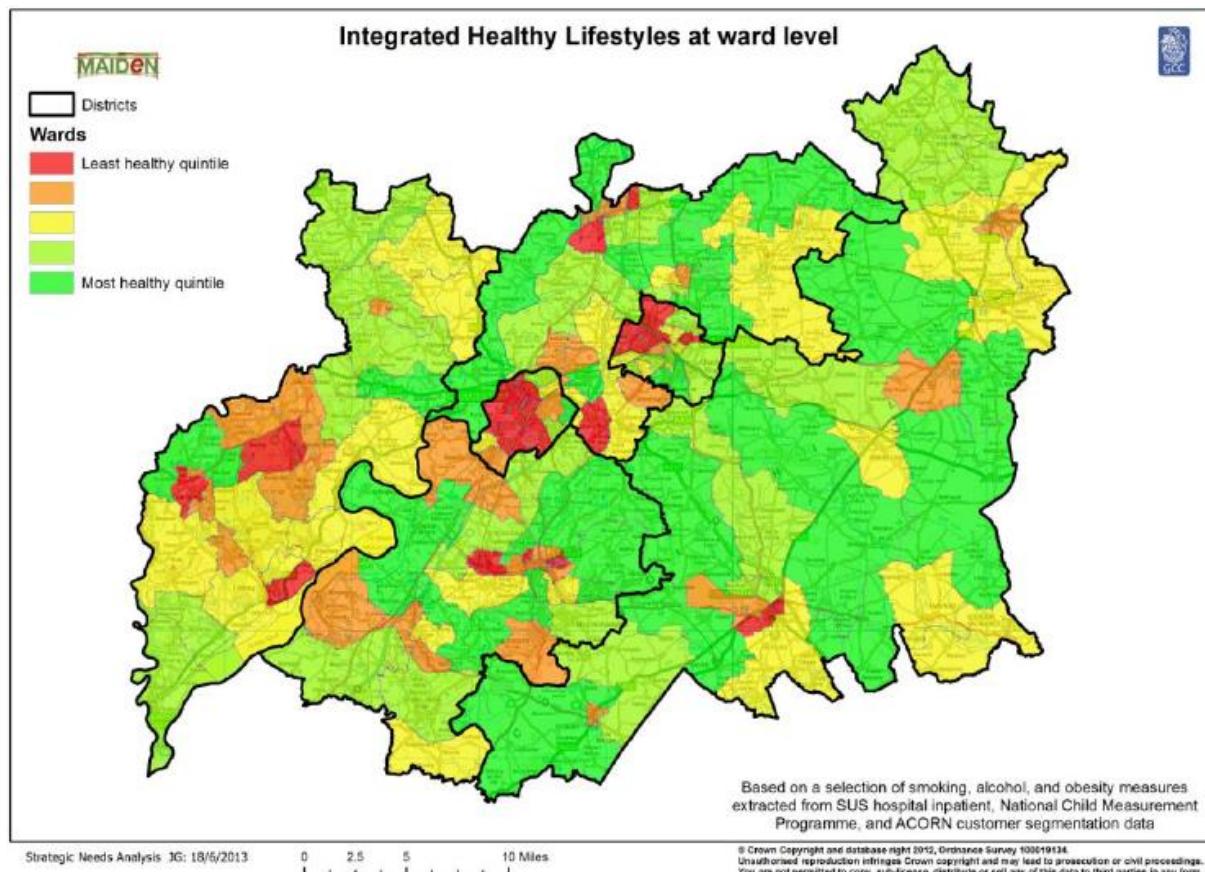
3.28 Figure 6 shows how Gloucestershire wards compare, with wards with the highest clustering of unhealthy behaviours shown in red. There is a strong correlation with deprivation; 13 of the top 20 wards contain LSOAs in deprivation quintile 1 which means they are among the 20% most deprived neighbourhoods nationally.

<sup>56</sup> Buck & Frosini (August 2012) Clustering of unhealthy behaviours over time: implications for policy and practice, The King's Fund.

<sup>57</sup> DH 2013, p.11

<sup>58</sup> Acorn is a commercial, consumer classification tool which segments populations based on a range of variables, including demographic data, and consumer behaviour.

**Figure 6: Clustering of lifestyle risk factors (smoking, alcohol and obesity) at ward level,**  
**Source: Strategic Needs Analysis Team, GCC.**



3.29 While the tool uses a mix of modelled and actual data, it does give an indication of those areas with the highest levels of unhealthy behaviours, and by implication a greater risk of developing CVD and other long term conditions.

### Health inequalities – contribution of CVD to the life expectancy gap in Gloucestershire

3.30 As discussed at 3.6, there are inequalities issues associated with CVD, most notably linked to deprivation. Locally, this is reflected in the contribution which CVD makes to the difference in life expectancy between those living in the most deprived parts of the county, and those living in the least deprived areas.

3.31 The latest available data from Public Health England indicates that in 2010-12 almost a third (31.4%) of the life expectancy gap<sup>59</sup> in men and a quarter (25.3%) of the life expectancy gap in women could be attributed to circulatory conditions, primarily CHD. In this period, circulatory conditions were responsible for 193 'excess' deaths in men living in

<sup>59</sup> Defined as the life expectancy gap between those living in Gloucestershire's most deprived quintile and those living in the county's least deprived quintile.

the most deprived quintile; and 106 'excess' deaths in women; which provides an indication of the number of lives which could potentially be saved were the difference in life expectancy in the county linked to circulatory conditions to be reduced.

### **Gloucestershire prevalence of metabolic risk factors for CVD**

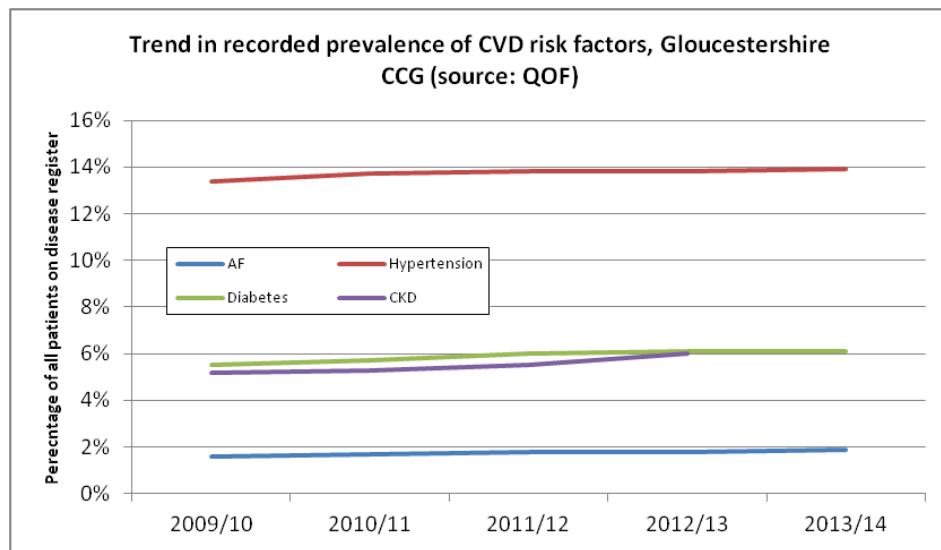
3.32 The CCG prevalence (taken from QOF disease registers) of hypertension, CKD and AF is significantly higher than the national average (table 2). This can most likely be attributed to the county's older age profile and the fact that QOF data is not age standardised. The prevalence of diabetes, which is less related to age, is significantly lower than the national average.

**Table 2: Prevalence of metabolic risk factors for CVD, Gloucestershire CCG 2013/14 (source: QOF PHE Practice Profiles).** Note: CKD data 2012/13.

Condition	Number of patients on disease register	CCG prevalence	National prevalence
Hypertension	87,106	13.9%	13.7%
Diabetes (17+)	31,125	6.1%	6.2%
Chronic Kidney Disease (18+)	29,811	6.0%	4.3%
Atrial Fibrillation	11,688	1.9%	1.6%

3.33 At the CCG level, recorded prevalence of hypertension, diabetes and AF has been relatively stable over recent years with only slight increases- consistent with the national trend (figure 7). CKD prevalence has seen a more notable increase; and is increasing at a faster rate than the national average. Further data is needed to see if the upward trend is sustained, but would be worth monitoring. Given the county's ageing population, over time, one might expect to see more notable increases in recorded prevalence of conditions such as hypertension and AF. Obesity levels may also result in higher rates of diabetes.

**Figure 7:**



3.34 QOF data only captures those individuals who have presented to their General Practice and been diagnosed; as such it may not be an accurate representation of the true prevalence of these conditions locally. As noted at 2.3, under diagnosis has been identified as an issue (Soljak et al 2011; DH 2013)

3.35 Table 3 shows where modelled, the estimated total prevalence of these conditions (diagnosed and undiagnosed) and based on these estimates, the proportion of the total number of cases which have been detected and recorded on QOF. While the estimates of total prevalence are based on *modelled* data, if correct, they may suggest room for improvement in detection rates, most notably with respect to hypertension and AF where it is estimated that 47% and 33% of cases in the county respectively, are undiagnosed. As noted previously (2.10), unmanaged hypertension has been identified as one of the leading factors contributing to the disease burden from CVD (Murray et al 2013; Mohan and Campbell 2009; Falaschetti et al 2009).

3.36 'Improving and enhancing case finding in primary care' is one of the core recommendations of the Department of Health's 2013 Outcome Strategy for Cardiovascular disease.<sup>60</sup> It calls for the identification of patients at risk of CVD to become routine practice via the use of existing programmes, such as NHS Health Checks (see section 5) and the introduction of new tools, with a particular focus on practices with lower than expected detection rates.

3.37 AF can be asymptomatic; and is estimated that one third of people with the condition have no obvious symptoms (Furberg 1994 cited in Moran et al 2013); highlighting the need for proactive case identification. There is an evidence base for opportunistic screening of

<sup>60</sup> DH (2013)

patients over the age of 65 in primary care to support the detection of undiagnosed AF; by checking the patient's pulse and arranging an ECG if the pulse is irregular. Opportunistic screening was found to be more cost effective than systematic screening and had a similar detection rate (Moran et al 2013; Harris et al 2012). There is scope to link opportunistic screening to attendance for the flu jab, or the NHS Health check (in those aged 65 plus).

**Table 3:**

Condition	Recorded prevalence (diagnosed)	Estimated actual prevalence (diagnosed and undiagnosed)	Estimated percentage of detected prevalence
Hypertension	13.9% (2013/14)	25.8% (2011)	53% (2010/11)
AF	1.9% (2013/14)	2.8% (2013/14)	67.1% (2013/14)
Diabetes	6.1% (2013/14)	7% (2012) YHPhO <sup>61</sup>	87.1% (13/14)

#### Prevalence of clinical risk factors at locality and practice level

3.38 Table 4 shows the variance in prevalence of clinical risk factors for CVD (recorded on QOF) at CCG locality level; and whether the difference (higher or lower) from the CCG average is statistically significant. Figures e-h (appendix b) show the variation at practice level.

**Table 4:**

Condition	CCG prevalence	Cheltenham	Forest of Dean	Gloucester City	North Cotswold	South Cotswold	Stroud and Berkeley Vale	Tewkesbury
Hypertension	13.9%	12.8%	16.5%	13.3%	16.3%	14.6%	14.0%	14.2%
Diabetes (17+)	6.1%	5.3%	7.4%	7.0%	6.1%	5.6%	5.7%	5.9%
Chronic Kidney Disease (18+)	6.0%	5.4%	7.4%	6.1%	6.2%	6.4%	6.1%	5.0%
Atrial Fibrillation	1.9%	1.8%	2.1%	1.5%	2.6%	2.3%	2.0%	1.9%

Key:

Red = significantly higher than CCG average

Green = significantly lower than CCG average

White = not significantly different to CCG average

Significance based on 95% confidence intervals

3.39 There is some variance in the prevalence of hypertension, diabetes, CKD and AF at locality level, but the variance is most marked at practice level. Prevalence of hypertension, for example, rises to 18% and above in six practices; compared to the CCG average of 14%.

<sup>61</sup> <http://www.yhpho.org.uk/resource/view.aspx?RID=154049>

There is similar variance in levels of diabetes; with four practices recording prevalence levels of 8% and above; against a CCG average of 6%.

3.40 Variation can be partly explained by differences in the age profile of the registered population. At the locality level, the Forest of Dean, and the North and South Cotswolds have older age profiles than the CCG as a whole and as such are more likely to have a higher prevalence of conditions, such as hypertension, CKD and AF. Differences in deprivation levels and ethnicity (both of which can impact on prevalence and likelihood of presentation), and the presence of lifestyle risk factors, such as obesity and poor diet, may also be contributory factors.

3.41 Practice variation may also reflect differences in detection rates, as well as the level of population need. Lower prevalence for example may be a sign of under diagnosis. The fact that Gloucester City has lower rates of hypertension and AF than the CCG average could reflect the younger age profile of the locality; but could also be an indication of under-diagnosis. The locality has higher levels of deprivation which is associated with people being less likely to present at health services. Higher population mobility in urban areas has also been cited as factor in under diagnosis (Soljak et al 2011).

3.42 The PHE Practice Profiles provide modelled estimates of the total expected prevalence of AF and Hypertension (i.e. diagnosed and undiagnosed) at practice level. Figures i and j (appendix b) provide a comparison between recorded prevalence of AF and hypertension at practice level and estimated actual prevalence. It shows that in all practices populations there are estimated to be more people with the condition than currently recorded on disease registers. The gap between recorded and actual prevalence is most marked with respect to hypertension. Again this potentially highlights scope to improve case finding, both within primary care, but also within the community to reach people why may not routinely access health services.

## Section 4: What is the disease burden from CVD in Gloucestershire?

### Prevalence of CVD (stroke, CHD and heart failure)

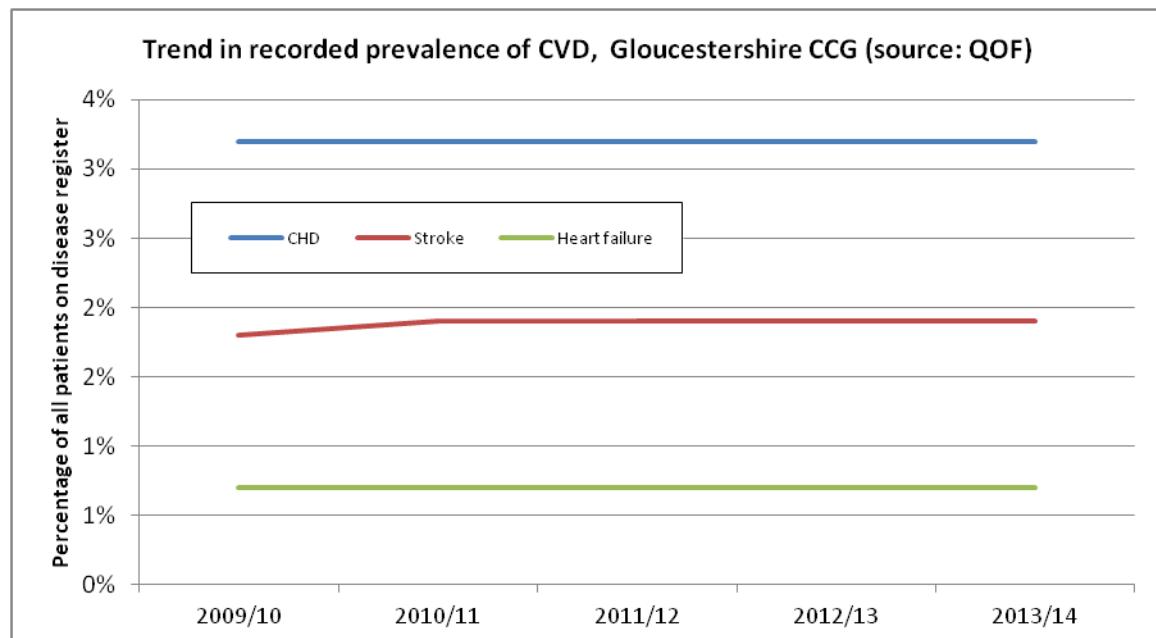
4.1 QOF registers provide prevalence data for CHD, stroke and heart failure at CCG level. Table 5 shows how the CCG prevalence compares to the national average; and also provides the number of patients with the condition currently recorded on disease registers. Based on 13/14 data, the local prevalence of CHD is significantly better than the national average, the prevalence of stroke significantly higher, and the prevalence of heart failure is in line with the national average. Again, it should be noted that QOF data is not age standardised (prevalence of stroke in particular may reflect the county's older age profile) and it only captures those individuals who have been diagnosed.

**Table 5: Prevalence of CHD, stroke and heart failure 2013/14 (source: QOF PHE Practice Profiles).**

Condition	Number of patients on disease register	CCG prevalence	England prevalence
Coronary Heart Disease	19939	3.2%	3.3%
Stroke	11684	1.9%	1.7%
Heart Failure	4330	0.7%	0.7%

4.2 Trend data shows that the prevalence of CHD, stroke and heart failure has remained relatively stable in recent years (figure 8)

**Figure 8:**



4.3 Table 6 shows the variation in prevalence of CHD, stroke and heart failure at locality level; and whether the difference (higher or lower) from the CCG average is statistically significant. Figures k-m (appendix b) show the variation at practice level.

**Table 6:**

Condition	CCG prevalence	Cheltenham	Forest of Dean	Gloucester City	North Cotswold	South Cotswold	Stroud and Berkeley Vale	Tewkesbury
Coronary Heart Disease	3.2%	3.0%	3.8%	3.0%	3.8%	3.1%	3.3%	3.1%
Stroke	1.9%	1.8%	2.4%	1.6%	2.3%	1.9%	1.8%	2.0%
Heart Failure	0.7%	0.7%	0.9%	0.6%	0.6%	0.7%	0.7%	0.5%

Key:

*Red = significantly higher than CCG average*

*Green = significantly lower than CCG average*

*White = not significantly different to CCG average*

*Significance based on 95% confidence intervals*

4.4 At the locality level, prevalence of CHD and stroke is significantly above the CCG average in the Forest of Dean and North Cotswold localities. The Forest of Dean locality also has significantly higher prevalence of heart failure. There is also variation at practice level. Stroke prevalence across practices ranges from less than 1% through to 3.1% (compared to a CCG average of 1.9%). Prevalence of CHD ranges from below 1.5% through to 4.7% (compared to a CCG average of 3.2%).

4.5 As noted, CVD is age related and variation at both locality and practice level can be partly explained by differences in the age profile of the registered population. The Forest of Dean and the North Cotswolds localities have older age profiles than the CCG as a whole, and as such would expect to see a higher prevalence of circulatory conditions. Differences in deprivation levels and detection rates may also be contributory factors.

4.6 To give an indication of detection rates, it is possible to compare modelled estimates for the expected total prevalence of CHD and stroke at practice level with the recorded prevalence captured on QOF (figures n and o) (appendix b). In the case of CHD, the data indicates that recorded prevalence in all practices is below the expected total prevalence, the implication being that some patients may yet to be diagnosed. For stroke there is a closer alignment between recorded prevalence and estimated total prevalence; with recorded prevalence in some practices exceeding the modelled estimates. The fact that stroke is typically an acute event requiring hospital care probably explains higher detection rates.

## Incidence of CVD (stroke and myocardial infarction)

4.7 Admissions data has been used to give an indication of the incidence of stroke and heart attacks in Gloucestershire. Rates are not provided in the source data, and as the data is not age standardised it is not appropriate to benchmark Gloucestershire against other areas.

4.8 In the period, Qtr2 2009/10- Qtr 4 2012/13 there were on average 205 people a quarter admitted to hospital following a stroke; of which an average of 131 people spent 90% of their time on a stroke unit. In the year 2012/13, 820 people were admitted to hospital following a stroke; 656 of whom spent 90% of their time on a stroke unit.<sup>62</sup> (Note: it is unclear from the data source, whether the number of patients admitted for stroke also includes suspected strokes or TIAs, as well as diagnosed strokes).

4.9 In the period, 2010/11 to 2014/15, the median number of admissions a year coded as I21 Acute myocardial infarction and I22 Subsequent myocardial infarction, was 393.<sup>63</sup>

## Co-morbidities

4.10 The Department of Health has observed that patients with multiple long term conditions (LTCs) are 'becoming the norm rather than the exception.'<sup>64</sup> National data indicates that while the number of people with one LTC is projected to be relatively stable over the next ten years, the number of people with multiple long term conditions is set to rise from a figure of 1.9 million in 2008 to 2.9 million by 2018.<sup>65</sup>

4.11 Multiple co-morbidities are common in the case of CVD. The Department of Health describe CVD as a 'single family of diseases and conditions linked by common risk factors'<sup>66</sup>; the implication being that people are likely to have more than one manifestation of the condition. Moreover, given that CVD shares common risk factors with other LTCs (notably age, but also lifestyle behaviours) it is to be expected that a diagnoses of CVD may co-exist with additional long term conditions, such as dementia and cancer.

4.12 Data is not currently available on the prevalence and combination of co-morbidities among CVD patients in Gloucestershire; however research carried out in other areas gives some indication of what the local picture may be. The Centre for Health Economics at the University of York has modelled service utilisation and attendant costs of co-morbidities

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<sup>62</sup> NHS England dataset: <http://www.england.nhs.uk/statistics/statistical-work-areas/integrated-performance-measures-monitoring/stroke-data/>

<sup>63</sup> Data obtained from Gloucestershire CCG Information & Finance team .

<sup>64</sup> Department of Health (2014) Co-morbidities: a framework of principles for system-wide action, London

<sup>65</sup> Department of Health (2012) Op.cit.

<sup>66</sup> Department of Health (2013)

across the health and social care services for the population of South Somerset.<sup>67</sup> With respect to their findings on CVD, eighty-five percent of patients with coronary heart disease as their main diagnoses and 90% of stroke patients had at least one additional condition. In the case of those patients with CHD, 41% had three or more additional conditions; and in the case of stroke patients, 45%. The research also looked at common combinations of diseases. Perhaps not surprisingly the most frequent co-morbidity for those with CHD was hypertension followed by diabetes, cancer and stroke. Skin infections and asthma were also present in some patients. Co-morbidities for stroke patients followed a similar pattern; with hypertension by far the most common additional diagnosis followed by CHD, diabetes and cancer. A diagnosis of anxiety was also recorded in some stroke patients.

4.13 Given the known interdependencies between the various cardiovascular diseases and the possibility of patients presenting with co-morbidities, the DH CVD Outcomes Strategy puts a strong focus on integrated care and a move away from treating patients in 'disease silos'. The strategy calls for progress in two key areas: firstly, the provision of integrated assessments for CVD to ensure that patients who have been identified with one cardiovascular condition are proactively assessed (either in primary or secondary care) for the presence of and/or risk of other conditions; and secondly more integrated care pathways to avoid duplication (of tests, for example) and ensure holistic management of patients with CVD co-morbidities.

## Trends in CVD mortality

4.14 Premature mortality (defined as deaths in people under the age of 75) is commonly used as a proxy indicator of overall health outcomes; and the effectiveness of prevention and treatment services.

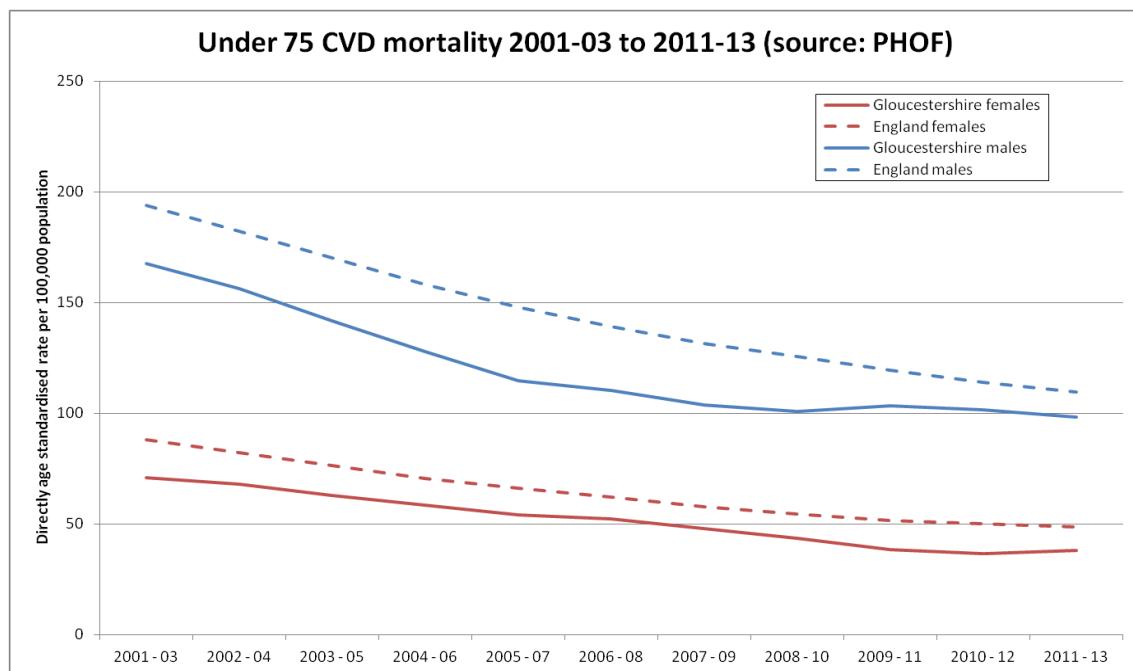
4.15 Overall there is a relatively positive picture with respect to premature mortality from CVD in Gloucestershire compared to the national average; however there is variation at district level, notably in Gloucester where rates of premature mortality remain the highest in the county.

4.16 The county has seen a downward trend in premature mortality from CVD in both men and women over the last decade in line with the trend for England (figure 9). While the decline has levelled out in recent years; the county rate (2011-13) remains significantly better than the national average (PHOF). Premature mortality is consistently higher in men, which is again consistent with the national picture.

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<sup>67</sup> Kasteridis P, Street A, Dolman M, Gallier L, Hudson K, Martin J, Wyer, I (February 2014), The Importance of multimorbidity in explaining utilisation and costs across health and social care settings: Evidence from South Somerset's Symphony Project, Centre for Health Economics, University of York.

**Figure 9**



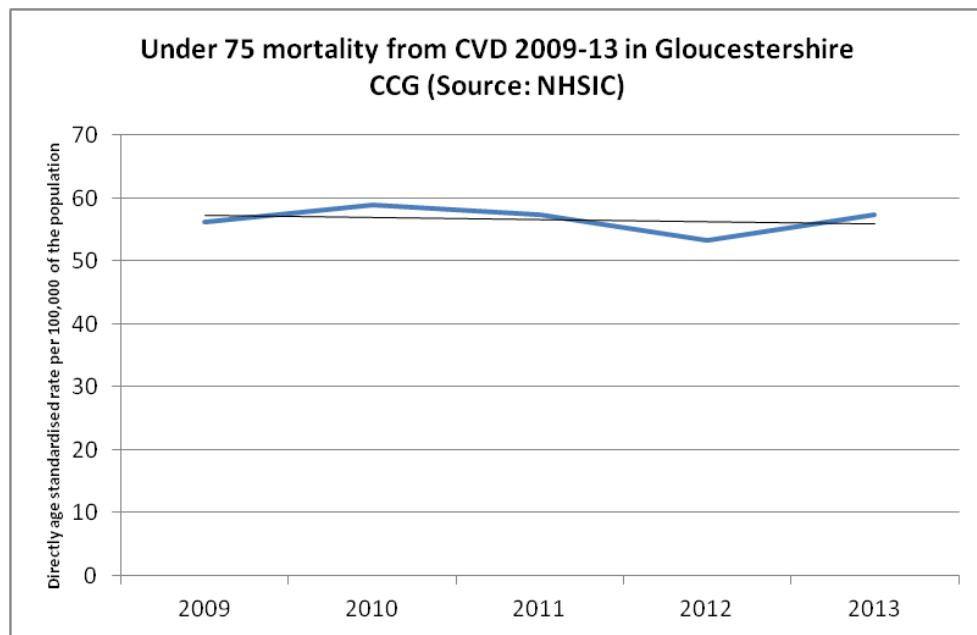
4.17 Under 75 mortality from CVD is included as an indicator in the CCG outcome framework. The latest performance data shows a year on year increase in the rate of premature mortality from CVD in the *registered* population between 2012 and 2013; from a rate of 53.3 (per 100,000 of the population) in 2012 to 57.4 in 2013<sup>68</sup>; causing the CCG to move from the 39<sup>th</sup> best placed CCG in 2012 to the 62<sup>nd</sup> best placed CCG in 2013.

4.18 It is helpful to look at the 2012 rate in the context of the premature mortality rate over the last five years (table 7 and figure 10). Despite the apparent rise between 2012 and 2013, as noted at paragraph 4.16, overall the trend in premature mortality in the county over the last five years has been relatively stable following a period of steady decline. The 2013 rate of premature mortality is in line with the average for the CCG's cluster group and remains below the national average of 64.9. It may be that the rate recorded in 2012 was unusually low for reasons which are unclear. However it is recommended that the data is monitored to see if the upward trend continues for a successive year.

*Note: the data used in the CCG outcome framework is based on the registered population rather than the resident population used in the Public Health Outcome Framework. This results in slight differences in rates between the two data sets.*

<sup>68</sup> CCG Outcome Framework, NHS Information Centre

**Figure 10:**



**Table 7: Under 75 mortality from CVD in Gloucestershire CCG (source: NHSIC)**

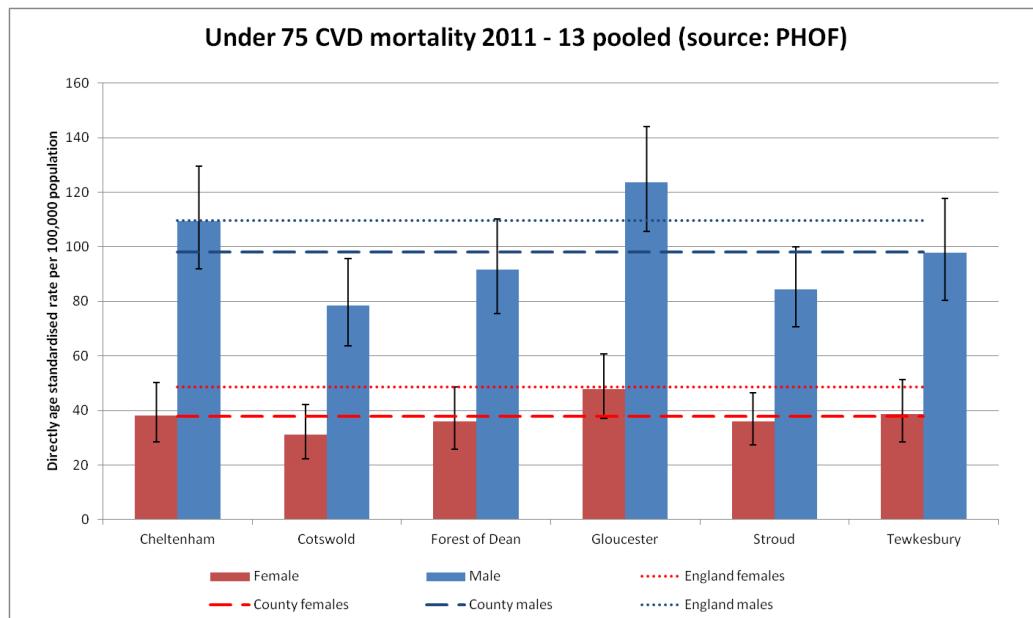
	Year	Under 75 mortality from CVD (DSR)
<b>Gloucestershire CCG</b>	2009	56.3
	2010	58.9
	2011	57.4
	2012	53.3
	2013	57.4

4.19 At the district level, premature mortality from CVD (2011-13) is significantly better than the national average in Cotswold, Forest of Dean and Stroud; and in line with the national average in Cheltenham, Gloucester, and Tewkesbury (PHOF). The highest rate of premature mortality is in Gloucester. This may relate to a number of factors, including higher prevalence of lifestyle risk factors (see section 3), deprivation levels and a higher proportion of people from BME communities. As noted at 3.2, people of African-Caribbean and South Asian ethnicity are at higher risk of some forms of CVD.

4.20 Figure 11 breaks down premature mortality by district and gender. Confidence intervals have been included to indicate whether the district rate is significantly different to the national and county average. The highest rates of premature mortality from CVD in the county in both men and women are in Gloucester; however they are not statistically higher

than the national average. Men in Cheltenham also experience rates above the county average, though the difference is not statistically significant.

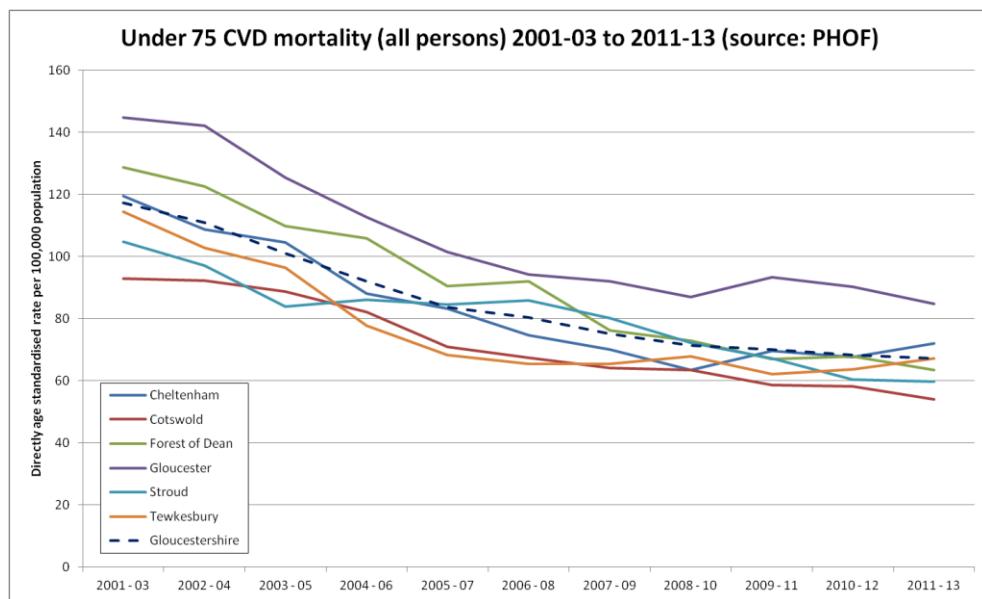
**Figure 11:**



4.21 All districts have seen a downward trend in premature mortality from CVD over the last decade; however in recent years there are signs of a slight upward trend in Cheltenham and Tewkesbury. This is not necessarily a cause for concern as year on year fluctuations are to be expected. However it would be worth monitoring the data to see if the trend is sustained.

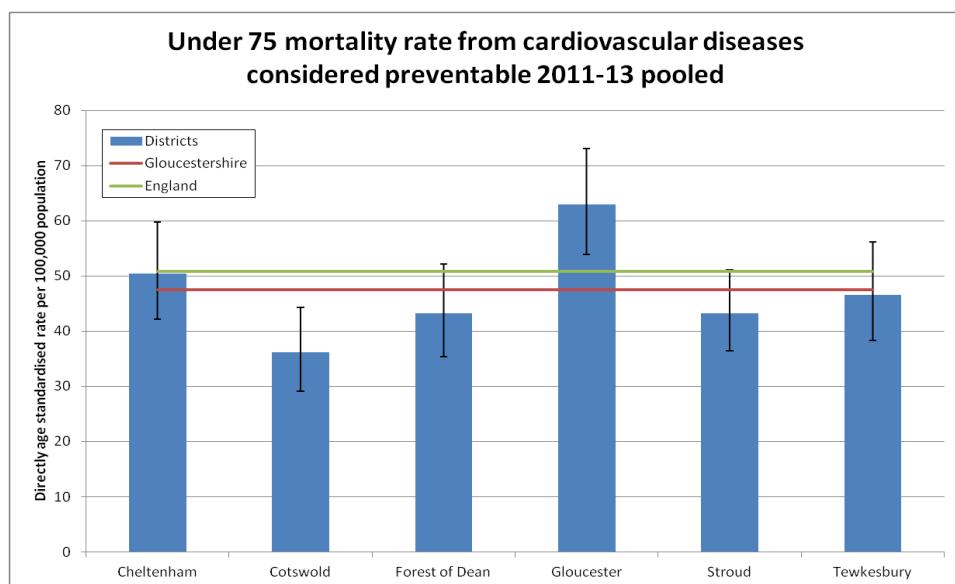
4.22 Figure 12 also demonstrates that while premature deaths from CVD are falling in Gloucester, the district has seen a consistently higher rate of early deaths from CVD than the county average across the last decade. Consideration should be given to how prevention and treatment services for CVD might be best targeted at particular areas and population groups to address these variations.

**Figure 12:**



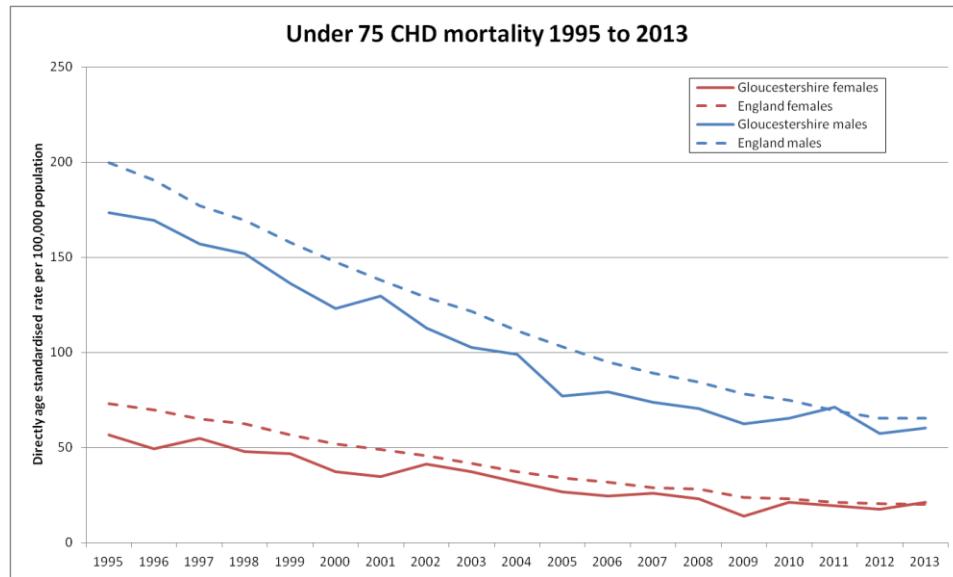
4.23 The Public Health Outcome Framework also provides data on *preventable* mortality from CVD (figure 13). A death is considered preventable if, in the light of understanding of the determinants of health at time of death, the death could have been avoided by public health interventions (as opposed to medical/treatments interventions) in the broadest sense. Gloucester district experienced the highest rate of potentially preventable deaths in 2011-13 (equivalent to 176 deaths which could have been prevented); followed by Cheltenham. This may relate to the ‘clustering’ of potentially modifiable behavioural risk factors in parts of Gloucester and Cheltenham, such as smoking and obesity (see section 3).

**Figure 13:**

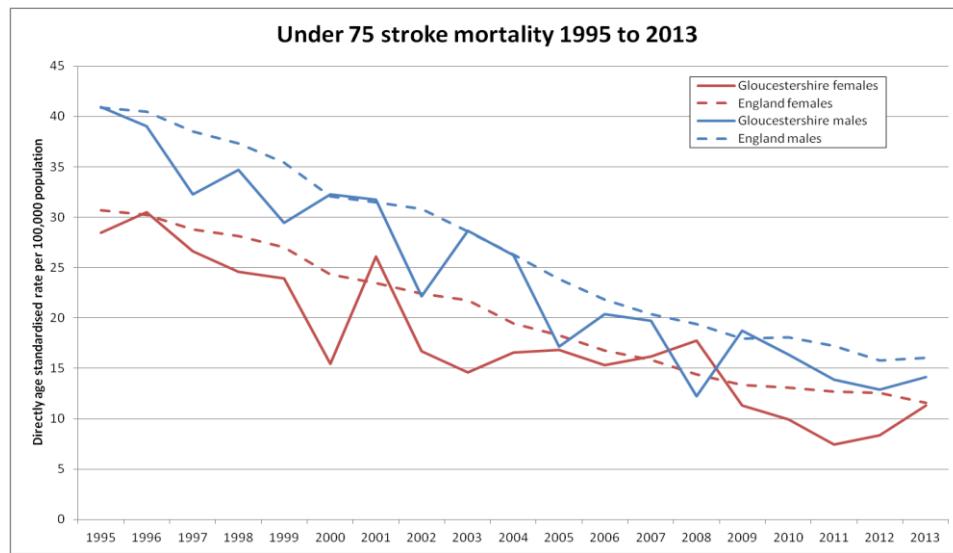


4.24 CHD is by far the leading cause of deaths from cardiovascular disease, followed by stroke. As such the data on premature mortality from both conditions largely mirrors the trend for CVD as a whole. As figures 14 and 15 show, at county level there has been a downward trend in early deaths from both conditions in men and women, in line with the national trend. There are notable fluctuations year on year in premature mortality from strokes, but this is to be expected given the relatively small sample size.

**Figure 14:**



**Figure 15:**

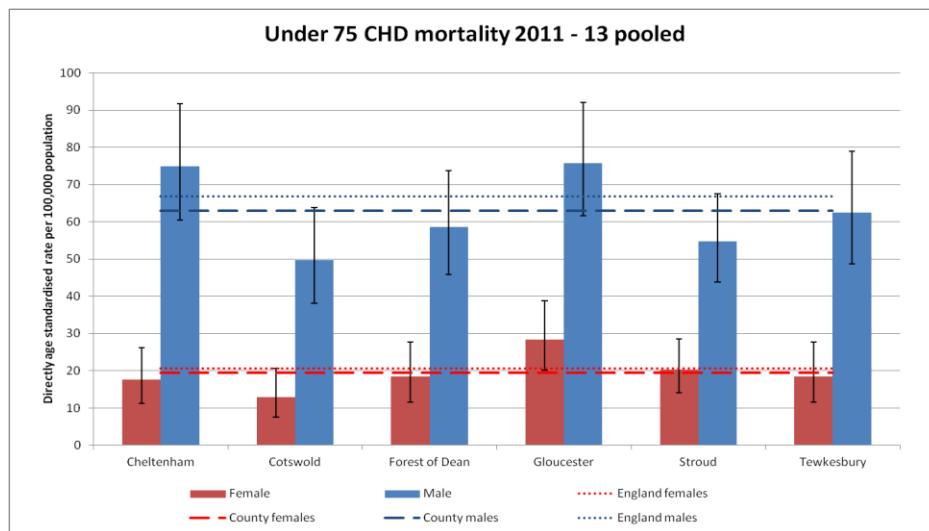


4.25 District level data for premature mortality from CHD and stroke again largely mirrors the picture for CVD (figures 16 and 17). In 2011-13, Gloucester had the highest rate of premature mortality from CHD in both men and women in the county. Rates of premature

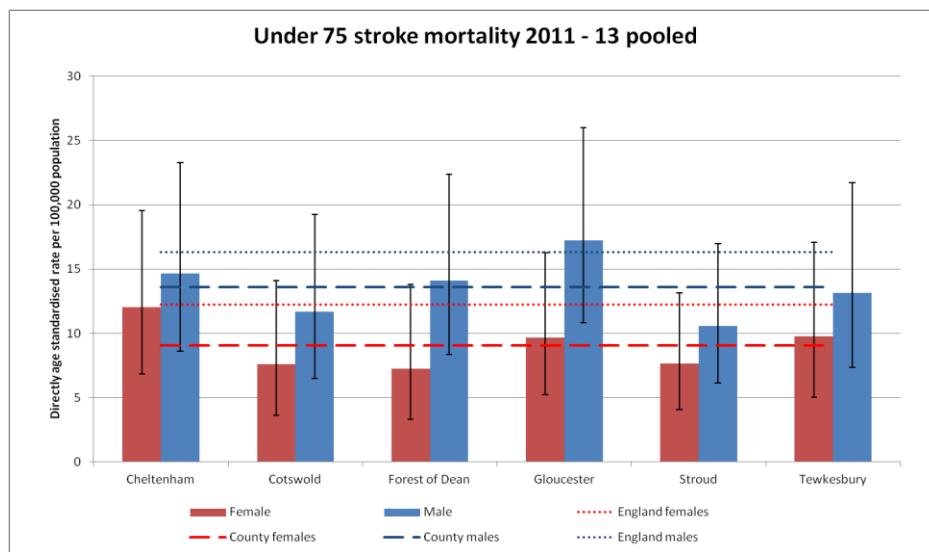
mortality from CHD in males in Cheltenham are also above the county average, though the difference is not statistically significant.

4.26 In 2011-13, early deaths from stroke in men in Gloucester were the highest in the county (figure 17) and Cheltenham district had the highest rate of premature mortality from strokes in women; however in neither instance was the difference from the national and county average statistically significant.

**Figure 16:**



**Figure 17:**



## Estimated expenditure on CVD

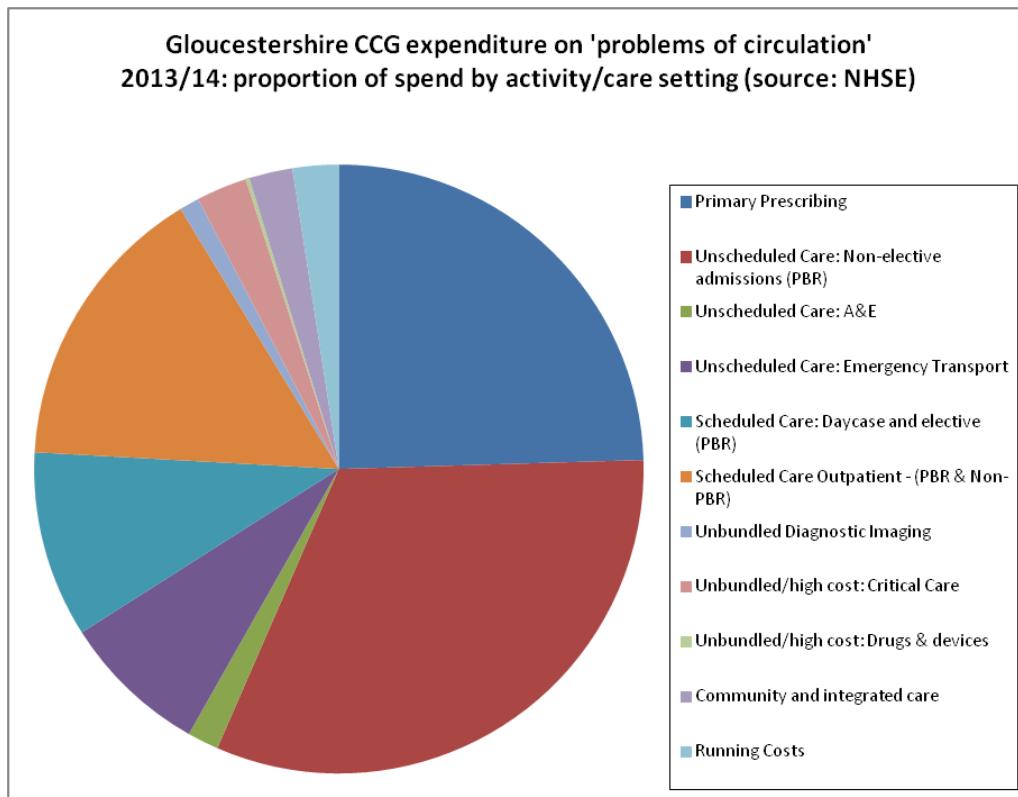
4.27 The NHS England Programme Budgeting Benchmarking tool provides spend by CCG for individual programmes of care and care settings. The tool includes spend on the programme budgeting category 'problems of circulation' which includes coronary heart disease, cerebrovascular disease, problems of rhythm, and problems of circulation (other).

4.28 Gloucestershire CCG's total expenditure on 'problems of circulation' in 2013/14 was £46.8 million; a reduction from £78 million in 2012/13. The categories into which spend is allocated have been updated in 2013/14 which makes direct comparisons with the previous year difficult, but the largest reductions on the previous year's spend appear to have occurred in 'primary prescribing', 'non-elective admissions', and 'day case & elective admissions'.

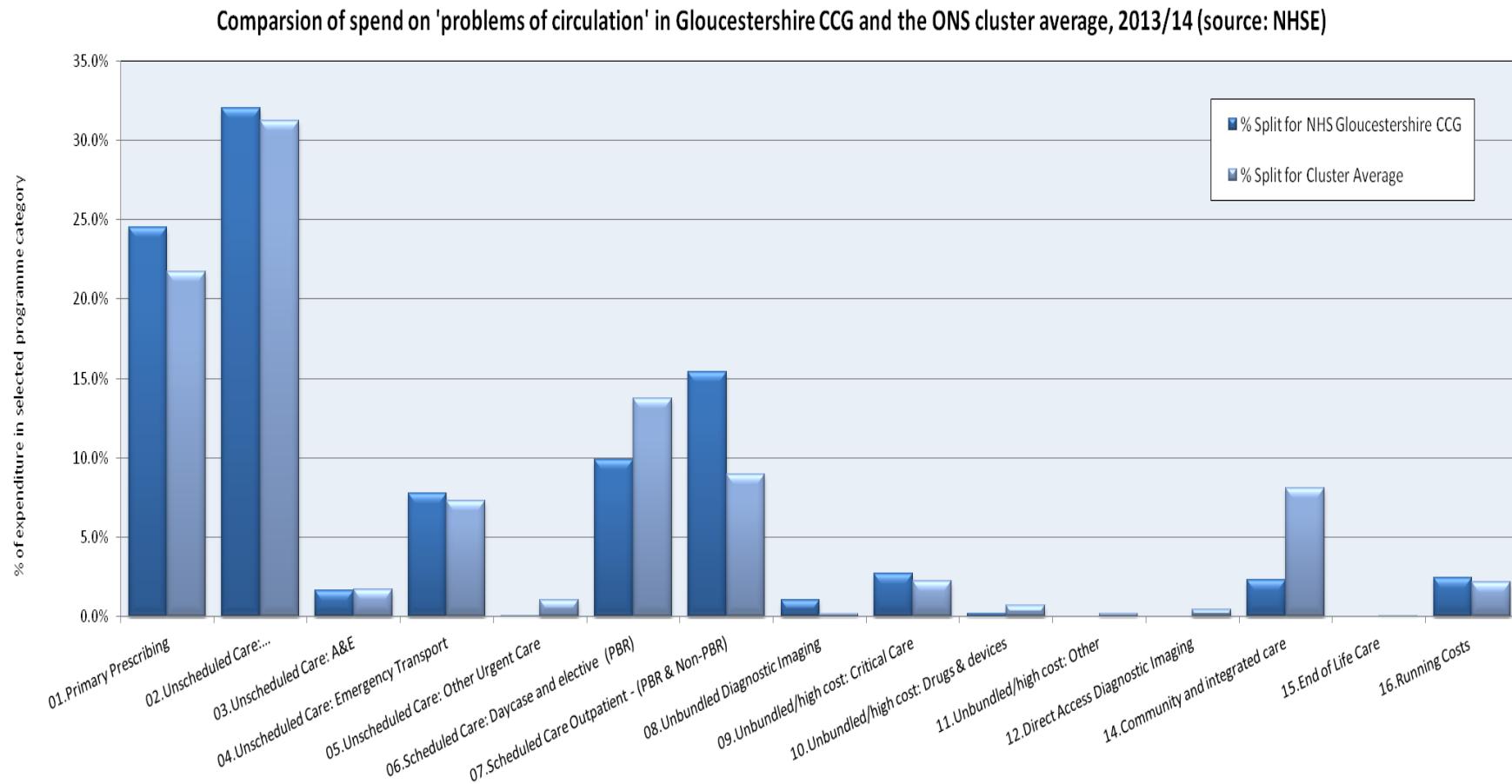
4.29 Excluding the budget category 'other'; circulatory problems were the third highest area of spend in 2013/14 after 'mental health disorders; and 'problems of the musculoskeletal system'. The highest area of spend within circulatory problems was on 'unscheduled care – non elective admissions' which accounted for almost a third (32%) of total expenditure; followed by primary prescribing at 24.5%; both areas of spend are broadly in line with the cluster average (figure 19). Figure 18 shows how the spend breaks down across activities/settings.

4.30 Figure 19 shows how spend on 'problems of circulation' benchmarks with the ONS cluster average. The most notable areas of variance are scheduled care and community and integrated care. In the case of the former, Gloucestershire spends more than the cluster average on outpatient appointments and less on day care & elective appointments. In the case of community and integrated care, spend in Gloucestershire is significantly lower than the cluster average.

**Figure 18:**



**Figure 19**



## Section 5: Management & prevention of CVD in Gloucestershire

### Primary care - Care processes and treatment indicators – QOF

5.1 As noted at 2.7 , studies have highlighted the contribution which appropriate care/medical therapies within the community have made to reducing premature mortality from CVD (notably the prescribing of statins and ACE-i/ARBs) (Bajekal et al 2012). However according to the Department of Health's CVD Outcomes strategy (2013) there is evidence to suggest that nationally people who have been diagnosed with CVD, or are at risk of developing CVD, are not always optimally managed in primary care.

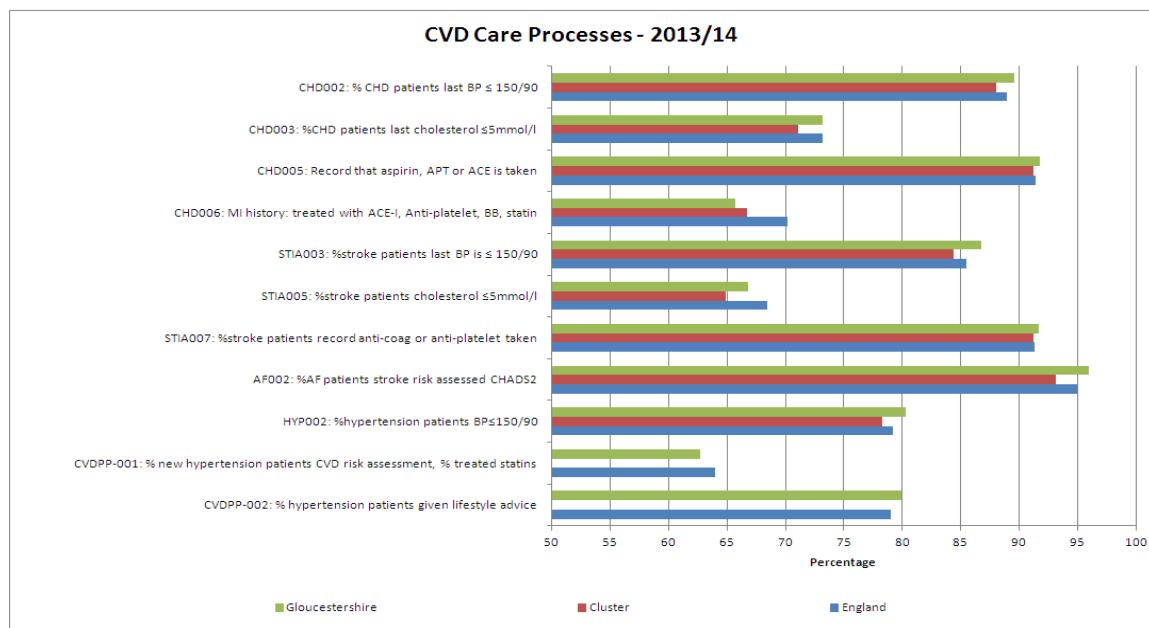
5.2 There are a number of clinical indicators recorded in QOF which provide an indication of how well cardiovascular diseases and associated risk factors are being managed in primary care. The QOF data for Gloucestershire practices can be accessed online via the PHE practice Profiles.

5.3 Overall across the relevant CVD QOF indicators for hypertension, stroke, AF and heart disease, Gloucestershire CCG benchmarks well against both the national average and the *average* of its 'cluster' CCG comparator group (figure 20)<sup>69</sup>. The indicator which does show more notable variance from the national average is CHD006 which records whether patients with a history of heart attack (MI) are currently treated with an ACE inhibitor, aspirin or an alternative anti-platelet therapy, beta blocker and statin. The CCG average for CHD006 is 65.7% compared to a national average of 70.2%, and a comparator average of 66.7%. Gloucestershire has a relatively high number of recorded exceptions for the indicator which may be a factor.

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<sup>69</sup> The 10 most similar CCGs to NHSG CCG are W Hampshire CCG, Somerset CCG, Wiltshire CCG, S Derbyshire CCG, Kernow CCG, E and N Hertfordshire CCG, Ipswich & E Suffolk CCG, Mid Essex CCG, Nene CCG and W Kent CCG. This comparator group is used in both the NHSE CVD profiles and the Commissioning for Value packs. The methodology used is available at:  
<http://www.england.nhs.uk/resources/resources-for-ccgs/comm-for-value/>

**Figure 20:**

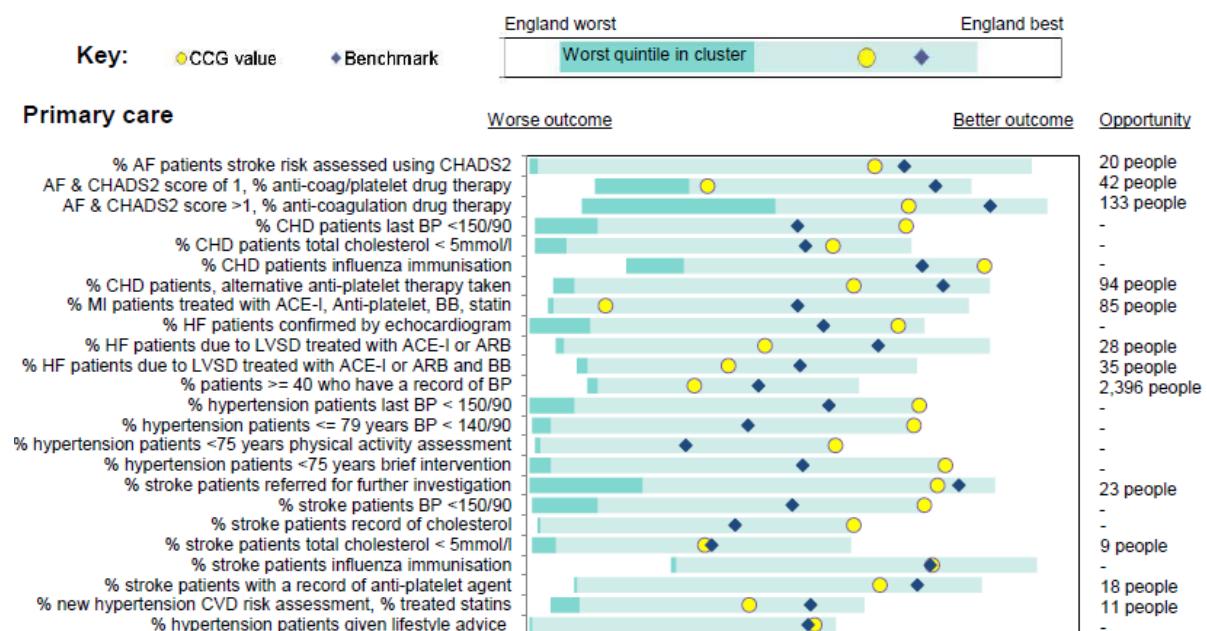


5.4 The Commissioning for Value (CfV) pack produced by NHS England uses a slightly different benchmark to assess CCG performance and identify opportunities for improvement. It ranks all the CCGs in the ‘cluster’ group and looks at how Gloucestershire compares to the average of the top 5 ranked CCGs within the ‘cluster’ (‘benchmark’) and the lowest two ranked CCGs (‘the worse quintile’). The findings are shown in figure 21. The CfV tool also quantifies the ‘opportunity’ that could be gained if the CCG were to improve to the benchmark value.

5.5 Overall Gloucestershire (represented by the yellow circle) was found to have no QOF indicators in the worst quintile for its cluster. It exceeded the benchmark (blue diamond) in 10 indicators and was ranked below the benchmark for 12 indicators; indicating ‘room for improvement.’ Of these 12 indicators, the ones where improvement was associated with the highest ‘opportunity gain’ in the number of patients receiving optimal care (80 people or above), were:

- AF004: Percentage of patients with AF whose latest record of a CHADS2 score is greater than 1, who are currently treated with an anti-coagulation therapy.
- CHD005: Percentage of patients with CHD with a record in the previous 12 months that aspirin, an alternative anti-platelet therapy, or an anticoagulate is being taken.
- CHD006: Patients with a history of MI currently treated with an ACE inhibitor, aspirin or an alternative anti-platelet therapy, beta blocker and statin (unless a contraindication or side effects are recorded).
- BP001: Percentage of patients aged 40 plus with recorded blood pressure in the last five years.

**Figure 21:**



### Practice variation

5.6 The average value for the CCG can mask variations in performance at the practice level. The proportion of patients with a history of MI being treated with an ACE-I, anti-platelet, beta blocker or statin (CHD006), for example, varies from 100% of patients (in five practices) to 50% or below in eleven practices. The proportion of new hypertension patients with an eligible CVD risk assessment score being treated with statins (CVDPP001) varies from 100% of patients in twenty three practices, down to 33.3% or below in thirteen practices (figure p, appendix b).

5.7 It is recommended that the CCG consider undertaking a deep dive in conjunction with practices to better understand trends in practice variation, and to determine the need and scope for improvement in CVD management within primary care, with a particular focus on the findings of the CfV benchmark analysis.

### **CVD prevention- NHS Health Checks (NHSHC)**

5.8 The NHS Health Check programme was phased in from 2009. It is designed to support CVD case finding and prevention by assessing an individual's risk of CVD and providing relevant advice and/or medication to help them reduce that risk. The Health Check is offered to all individuals between the ages of 40 and 74 (once every five years) who have not already been diagnosed with CVD. The programme is commissioned by Local Authorities and is a mandated function under the Health and Social Care Act. The regulations state that

Local Authorities must achieve a 100% offer rate in their eligible resident population over five years; ideally to be achieved by offering the health Check to 20% of the eligible population annually. There is no national uptake target; however Public Health England has set an ‘aspiration’ of a 66% uptake rate in the eligible population.

5.9 In Gloucestershire, the Health Checks programme is based on a GP-delivery model. In 14/15, the data suggest that 24.4% of the eligible population in the county were offered a Health Check (above the national ambition of 20%), and 36% of these went on to receive a Health Check. This compares to a national offer rate of 19.7%, and a national uptake rate of 48.8%.<sup>70</sup>

Figure 22 shows the proportion of eligible patients who have been invited to attend for a Health Check at locality level in 14/15; and the proportion of the eligible population who have received a completed health check. The data suggests that a number of GP localities are falling below the average invite rate for the county (23.7% - see footnote)<sup>71</sup>; and that the average uptake rate of 8.4% of the eligible population (in year) remains relatively low.

5.10 Caution needs to be applied to the county and locality data cited here as it may not accurately reflect NHS Health Check delivery locally.

- Patients who have been invited more than once (as per guidance) could have been counted as two patients – meaning local invitations may have been over reported.
- Patients who have been moved onto a CVD disease register as a result of their Health Check might not have been captured – meaning the local uptake rate may be an under estimation.

Work is underway to review the current process by which Health Check data is recorded and reported by practices in order to improve data accuracy going forward. Practices are now able to report their own quarterly performance data enabling commissioners to cross reference it with the data collated by the Primary Care Clinical Audit Group.

5.11 Despite concerns over the accuracy of the current data, there are still indications that local, and indeed national uptake is falling below the ‘aspirational’ target of 66% of the eligible population. This would suggest the need for further exploration as to why people who receive an invitation don’t take up the offer; whether any particular groups are less likely to attend than others; and whether alternative forms of delivery might be more appropriate for reaching higher risk individuals.

5.12 The local Public Health Enhanced Service through which General Practices ‘sign up’ to deliver Health Checks changed in 15/16 to a payment system linked to actual activity rather

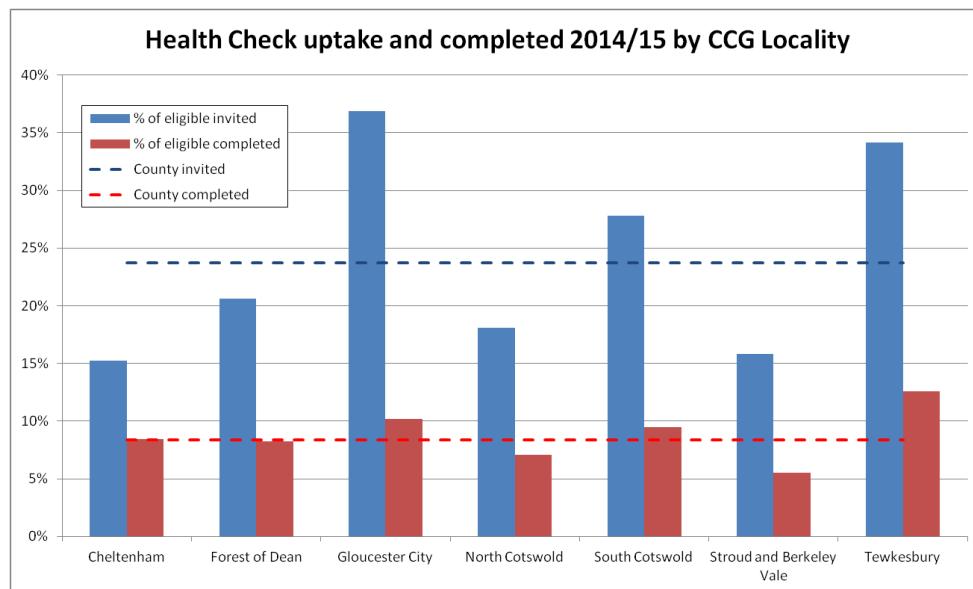
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<sup>70</sup> [http://www.healthcheck.nhs.uk/interactive\\_map/south\\_of\\_england/avon\\_gloucestershire\\_and\\_wiltshire/](http://www.healthcheck.nhs.uk/interactive_map/south_of_england/avon_gloucestershire_and_wiltshire/)

<sup>71</sup> Note: the average offer rate for the county (23.7%) differs slightly to that recorded on the national NHSHC database (24.4%). This is due to differences in how the denominator (the number of the eligible population aged 40-74) is calculated.

than anticipated activity. This may have an impact on the number of practices who continue to offer the Health Check service in Gloucestershire. Public Health Commissioners are working with practice managers and the locality executive groups and the LMC to review practice engagement in the scheme, ensure equity of coverage across the county, and investigate the potential for GP led outreach provision. There may also be an opportunity to review alternative delivery models and/or outreach outside of the primary care setting.

**Figure 22**



## CVD prevention- smoking cessation

5.13 Gloucestershire County Council commission a county-wide NHS Stop Smoking Service which offers free support to smokers to quit. In 14/15, the service achieved a quit rate of 58%, above the national average of 51%. The service also has specific targets for the number of quitters (measured at 4 weeks) achieved amongst people being treated for mental health conditions and those from areas of deprivation (including those in routine and manual occupations). The service met both targets in 14/15. Reducing smoking prevalence amongst both groups is particularly relevant given the increased risk of CVD in areas of deprivation, and in individuals with mental health conditions (see 3.6).

5.14 Primary care can also play a role in providing cessation advice or treatment to smokers, and/or signposting them to relevant local services. QOF records whether practices have a record of such support being offered to smokers registered at the practice (indicator SMOK004 – figure s, appendix b). CCG wide, 85.2% of smokers were recorded as having received this 'offer' in the last 24 months; in line with the national average of 84.3% (13/14).

However there is variation at practice level; with the proportion of smokers who have been offered cessation support falling below 70% in 10 practices.

5.15 QOF also records whether patients who smoke who are on certain disease registers, including CHD, stroke or TIA, PAD or hypertension, have been offered support/treatment to quit (SMOK005- figure t, appendix b). The CCG average for 13/14 was 94.2%, in line with the national average of 93.1%. While the variation at practice level is less marked, nine practices are significantly below the national average for this indicator.

5.16 It is recommended that this variation is explored with practices to understand whether the QOF data is a valid reflection of smoking cessation activity within practices; and whether more can be done to enable primary care professionals to support smokers to quit.

5.17 There is also a Public Health Enhanced Service (PHES) covering provision of stop smoking services within primary care. Practices who sign up to the PHES receive remuneration for each smoker within the practice who sets a quit date, and for successful quits at four weeks.

5.18 A total of 74 Gloucestershire practices were signed up to the smoking cessation PHES in 14/15. Across these practices, 2,455 smokers set quit dates during 14/15; of these 1,268 went on to quit at four weeks, equivalent to an average quit rate of 52%.<sup>72</sup> Looked at as a proportion of the total estimated number of smokers (aged 15 plus) registered at the PHES practices (QOF 13/14), 3% of smokers set quit dates under the PHES and 1.6% quit. The data would suggest scope to work with practices signed up to the PHES to understand potential barriers to referring smokers to a specialist adviser with a view to increasing activity.

## CVD prevention- weight management

5.19 Slimming World is commissioned to provide a community based weight management on referral service (WMOR) in the county. The service is contracted by the CCG and funded by Public Health. Patients are eligible for referral if they have a BMI of 30 or above; or 28 or above with co-morbidities. The service provides twelve weeks free weight management support.

5.20 Figure 23 shows the proportion of obese patients (as recorded on QOF registers) referred to Slimming World at GP locality level. Figure s (appendix b) shows the referral rate at practice level. On average practices referred 13% of patients on the obesity register to the service, which would suggest scope for improvement. The highest proportion of referrals was in Stroud and Berkeley Vale locality.

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<sup>72</sup> Data taken from Public Health PHES Activity Tracker 14/15.

**Figure 23:**



5.21 The local programme performs well against best practice guidance for weight management services issued by the Department of Health and referenced in NICE guidance<sup>73</sup>. 68% of participants completed the twelve week programme in 13/14 (against a recommended level of  $\geq 60\%$ ); and 42.6% of participants achieved a weight loss of 5% (above the recommended level of  $\geq 30\%$  of participants). A total of 61.8% of participants lost 3% of their initial weight, which is the current level of weight loss recommended by NICE.

5.22 Uptake of the local WMOR service is notably lower among men (87.5% of service users in 14/15 were female). This is consistent with national evidence which shows that men are less likely to engage with traditional 'weight loss' groups; and health services *per se*. Given that men are at higher risk of premature mortality from CVD, commissioners may want to consider developing alternative approaches to engage with men, both around weight loss and potentially other lifestyle behaviours.

## Section 6: Secondary care of CVD – emergency and elective admissions

6.1 The Clinical Commissioning Group (CCG) have provided data on elective and emergency admissions in the county for stroke, CHD and 'other' admissions coded as cardiovascular conditions. The ICD codes and respective conditions included in each category are listed at

<sup>73</sup> NICE guidelines (PH53) (May 2014) Managing overweight and obesity in adults: lifestyle weight management services. <https://www.nice.org.uk/guidance/PH53/chapter/1-Recommendations>

appendix a. The data covers a two year period April 13/14 to end March 14/15, and local performance is benchmarked against the average of the CCG's cluster group of comparator CCGs. It should be noted that the ICD diagnosis codes for CHD and 'CVD other' used to prepare the data differ slightly to the standard codes used by the NHS Information centre and PHE. This needs to be taken into account if making comparisons with national data sets.

6.2 A further caveat with the data provided is the absence of control limits. This makes it hard to determine whether the data is exhibiting expected or natural variation in admissions over a given period of time. Future analyses of admissions data may wish to consider the application of control limits to enable unexpected or significant variation to be more easily identified.

6.3 Looking at the data provided, there were a total of 1,888 admissions in Gloucestershire coded as stroke (an average of 78 per month) over the two year period for which data was provided. Of these, 98.6% were emergency admissions. The low percentage of elective admissions is to be expected given the acute nature of strokes.

6.4 There is a similar picture with respect to admissions for CHD. Over the two years, 94.4% of the 1,289 admissions for CHD were emergency admissions; while 5.6% (equivalent to 72 admissions) were elective. There may be scope to explore whether more emergency admissions for CHD could have been avoided through improvements in secondary prevention.

6.5 Overall the county benchmarks well against its comparator CCGs for stroke emergency admissions; remaining below the average of the comparator group (figure 24).

Trend data shows that there has been a slight increase in the county rate of emergency admissions for stroke over the two year period studied; though there was a fall in the final quarter of 14/15. More recent data is needed to see if the downward trend has been sustained. The inclusion of control limits would also help determine whether the fall is due to natural variation.

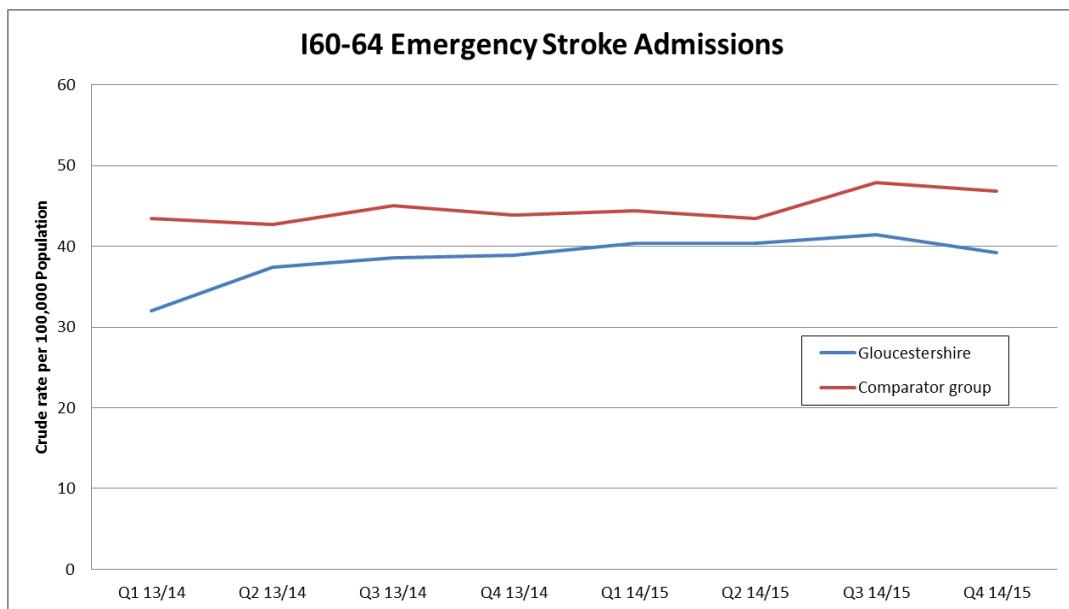
6.6 In the case of CHD, the county rate of emergency admissions has also remained below the average of the comparator group across the two year period; and has remained relatively stable. Again admissions saw a fall in the final quarter of 14/15, though further data and the inclusion of control limits would be recommended to determine whether the fall is significant (figure 25).

6.7 There were a total of 5,168 admissions between April 13/14 and end March 14/15 classified as 'CVD other' (see appendix a); of which 59% were emergency admissions. While quarterly admission rates vary overall, when trend lines are inserted, we can see a slight upward trend in both emergency and elective admissions in this category (figures 26 and

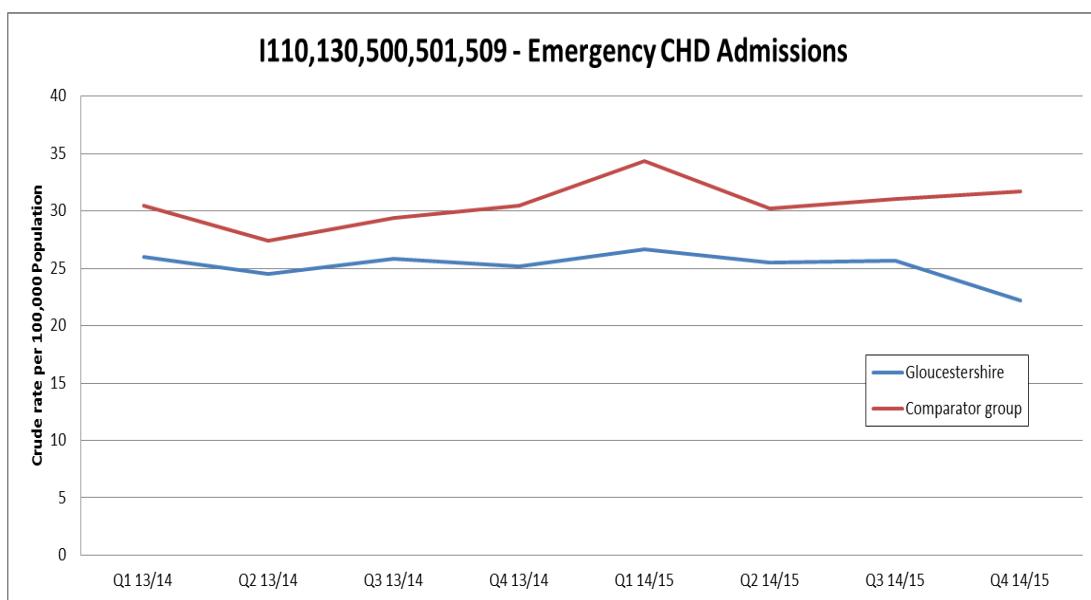
27); however the county admission rates remains in line with or below the comparator group.

Given the larger number of diagnosis codes/conditions covered by this category, CCG may wish to consider a deeper dive within the data set to identify which specific conditions make up the majority of admissions and whether there is scope both to reduce the number of referrals to secondary care; and the number of patients admitted as an emergency.

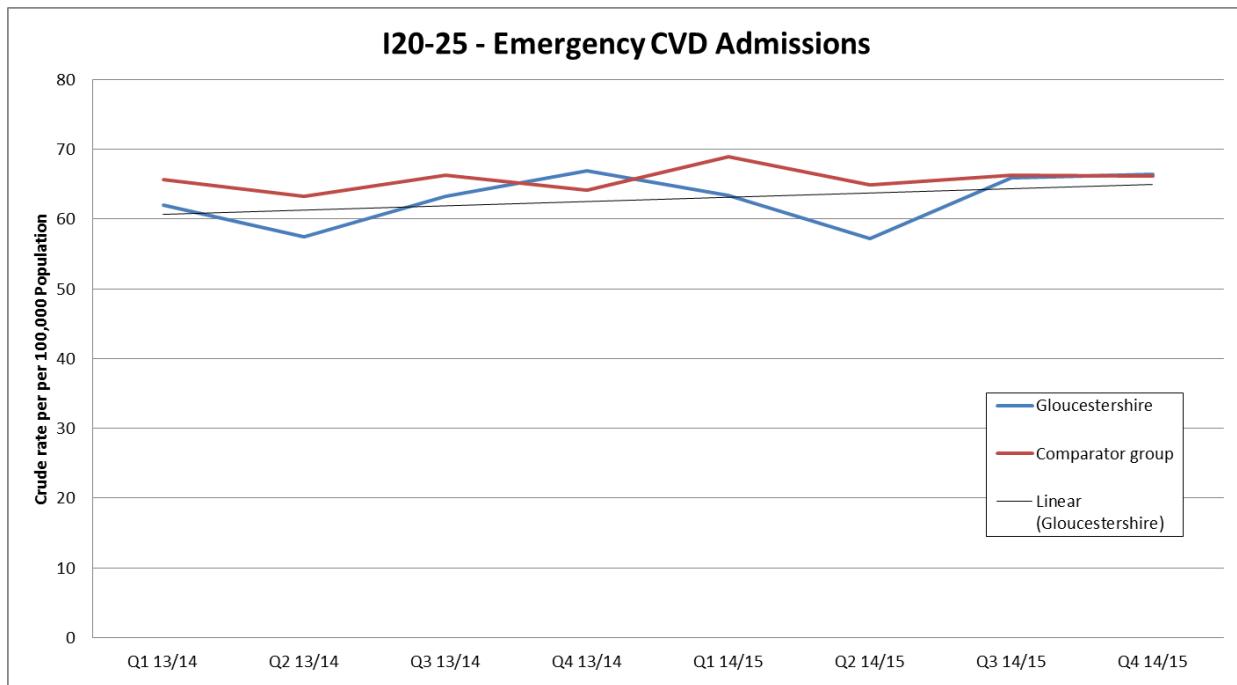
**Figure 24**



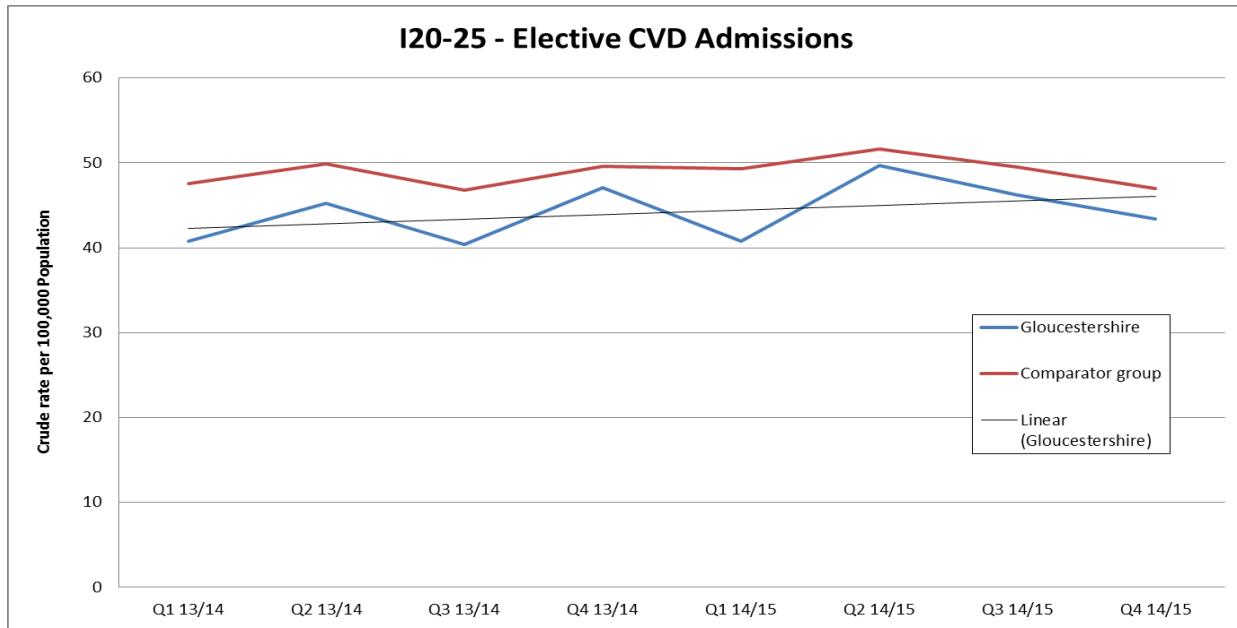
**Figure 25**



**Figure 26**



**Figure 27**



## Section 7: Health outcomes

7.1 This section considers local performance against relevant indicators with the Public Health Outcome Framework and CCG Outcome Framework. The Outcome Frameworks provide comparative performance data and can help identify opportunities for improvement.

### Public Health Outcome Framework (PHOF)

7.2 The Public Health Outcome Framework (PHOF) contains a number of indicators relevant to CVD. A summary of local performance against these indicators has been outlined previously and is not repeated here; however links to the relevant paragraphs are provided.

- prevalence of lifestyle risk factors – smoking prevalence (3.18), alcohol related hospital admissions (3.24), physically active adults (3.22) and excess weight in adults (3.20).
- Prevalence of physiological risk factors – recorded diabetes (3.34)
- under 75 mortality rate from cardiovascular diseases (4.14).

### Clinical Commissioning Group Outcome Framework (14/15)

7.3 The CCG outcome framework also includes a measure of **premature mortality from CVD**. Gloucestershire CCG performance against this indicator is summarised in paragraph 4.17.

7.4 The CCG outcome framework (CCGOF) incorporates five indicators from the Sentinel Stroke National Audit programme (SSNAP), which measures the quality of care received by stroke patients through the care pathway. The data has been newly released at CCG level for 13/14 and trend data is not available.

7.5 Gloucestershire is ranked in the top quartile of CCGs (nationally) for the **percentage of stroke patients who receive a follow-up assessment between 4-8 months after their initial admission**; 69.5% of patients significantly better than the national average of 16.3%.

7.6 Gloucestershire is ranked in the middle two quintiles for the remaining SSNAP indicators included in the CCGOF (note: data for some CCGs has been suppressed due to small numbers, meaning that the number of CCGs included in the indicator dataset may vary).

- **Stroke patients admitted to a stroke unit within four hours of arrival at hospital:** 52.1% of patients locally, below the national average of 59.9% (placing Gloucestershire 157<sup>th</sup> out of 211 CCGs nationally; just outside the bottom quartile).

- **Stroke patients who receive thrombolysis following an acute stroke:** 9.4% of patients locally, below the national average of 11.6% (placing Gloucestershire 150<sup>th</sup> out of 211 CCGs nationally; just outside the bottom quartile)
- **Stroke patients who are discharged from hospital with a joint health and social care plan:** 87.3% of patients locally, above the national average of 69.1% (placing Gloucestershire 71<sup>st</sup> out of 193 CCGs nationally); and
- **Stroke patients who spend at least 90% of their time on an acute stroke unit:** 81.1% of patients locally, below the national average of 83.6% (placing Gloucestershire 131<sup>st</sup> out of 193 CCGs nationally)

7.7 The PHE Cardiovascular Disease profiles also include an additional SSNAP indicator measuring the **proportion of patients admitted for stroke with a history of atrial fibrillation, who have previously been prescribed anticoagulation prior to their stroke**. In Gloucestershire, 41.4% of such patients had been previously prescribed anticoagulation in line with the national average of 39.7%. (*Note: Gloucestershire CCG is rolling out the 'Don't Wait to Anti-coagulate' project (in conjunction with the West of England Academic Health Sciences Network) aimed at facilitating a shift in the way that AF is managed in primary care, notably via the optimisation of anticoagulation for AF stroke prevention*).

7.8 Overall performance against the SSNAP indicators suggests areas of potential improvement in the care pathway. The CCG has already put an action plan in place with Gloucestershire Hospitals Trust to address this. Consideration should also be given to supplementing the SSNAP data with qualitative research with stroke patients and their carers to better understand how the pathway performs from the service user perspective.

### **End of life care**

7.9 According to the Department of Health CVD Outcomes strategy many CVD patients are receiving 'suboptimal care' at the end of life.<sup>74</sup> DH cites evidence from a national survey of relatives carried out in 2012, which indicated that while the quality of care for CVD patients in the last three months of life varies across the country; it is generally less good than for patients dying of cancer. Experience of care for patients dying in hospital is identified as being particularly poor. Gloucestershire CCG may wish to carry out local research with service users and their carers/families to explore the experience of end of life care for patients with CVD in the county.

7.10 There is also national evidence to suggest that people with CVD may not be dying in the place of their choice. Research carried out on behalf of the 'National End of Life Care Intelligence network' indicates that while the majority of people would prefer to die at

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<sup>74</sup> Department of Health (2013), p.55

home, the majority of deaths take place in hospital.<sup>75</sup> In the South West, two thirds of respondents preferred to die at home; followed by 27% in a hospice. Hospitals and care homes were the least preferred places of death. However as people age, while dying at home still remains the preferred option, the preference to die in a hospice also increases, particularly in those aged 75 plus.

7.11 In Gloucestershire, 51.4% of deaths in 2011-13, in which circulatory diseases were the underlying cause of death, occurred in hospital; significantly below the national average of 54.9%. The proportion of CVD patients dying at home was significantly above the national average; 27.7% compared to 25.5% nationally. The proportion of deaths in care homes (18.4%) was in line with the national average (16.9%); as was the proportion of deaths in hospices, which currently represent less than 0.3% of all deaths among CVD patients in the county.<sup>76</sup>

7.12 While Gloucestershire has a lower number of deaths in hospital among CVD patients than the national average, and a higher number of deaths at home; there may still be scope to explore how palliative care might be extended at home and in hospices to increase the likelihood of meeting people's preferences regarding end of life care and place of death. The National End of Life Care Intelligence Network cites a number of potential models, including 'Hospital at Home services'.<sup>77</sup>

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<sup>75</sup> Gomes, B et al (August 2011) Local preferences and place of death in regions within England 2010, National End of Life Care Intelligence Network, London.

<sup>76</sup> [http://www.endoflifecare-intelligence.org.uk/profiles/CCGs/Place\\_and\\_Cause\\_of\\_Death/atlas.html](http://www.endoflifecare-intelligence.org.uk/profiles/CCGs/Place_and_Cause_of_Death/atlas.html)

<sup>77</sup> Shepperd S, Wee B, Straus SE. Hospital at Home: home-based end of life care, Cochrane Database of Systematic Reviews 2011. Cited by Gomes et al (August 2011) op.cit.

## **Appendix a**

**ICD diagnosis codes and respective conditions used in Section 6: Secondary care: elective and emergency admissions; as supplied by Gloucestershire CCG Finance and Information team.**

### **I60-64 Stroke**

I600 - Subarachnoid haemorrhage from carotid siphon and bifurcation, I601 - Subarachnoid haemorrhage from middle cerebral artery, I602 - Subarachnoid haemorrhage from anterior communicating artery, I603 - Subarachnoid haemorrhage from posterior communicating artery, I604 - Subarachnoid haemorrhage from basilar artery, I605 - Subarachnoid haemorrhage from vertebral artery, I606 - Subarachnoid haemorrhage from other intracranial arteries, I607 - Subarachnoid haemorrhage from intracranial artery, unspecified, I608 - Other subarachnoid haemorrhage, I609 - Subarachnoid haemorrhage, unspecified, I610 - Intracerebral haemorrhage in hemisphere, subcortical, I611 - Intracerebral haemorrhage in hemisphere, cortical, I612 - Intracerebral haemorrhage in hemisphere, unspecified, I613 - Intracerebral haemorrhage in brain stem, I614 - Intracerebral haemorrhage in cerebellum, I615 - Intracerebral haemorrhage, intraventricular, I616 - Intracerebral haemorrhage, multiple localized, I618 - Other intracerebral haemorrhage, I619 - Intracerebral haemorrhage, unspecified, I620 - Subdural haemorrhage (acute)(nontraumatic), I621 - Nontraumatic extradural haemorrhage, I629 - Intracranial haemorrhage (nontraumatic), unspecified, I630 - Cerebral infarction due to thrombosis of precerebral arteries, I631 - Cerebral infarction due to embolism of precerebral arteries, I632 - Cerebral infarction due to unspecified occlusion or stenosis of precerebral arteries, I633 - Cerebral infarction due to thrombosis of cerebral arteries, I634 - Cerebral infarction due to embolism of cerebral arteries, I635 - Cerebral infarction due to unspecified occlusion or stenosis of cerebral arteries, I636 - Cerebral infarction due to cerebral venous thrombosis, nonpyogenic, I638 - Other cerebral infarction, I639 - Cerebral infarction, unspecified, I64X - Stroke, not specified as haemorrhage or infarction.

### **CHD I10, I130, I500, I501, I509**

I110 - Hypertensive heart disease with (congestive) heart failure, I130 - Hypertensive heart and renal disease with (congestive) heart failure, I500 - Congestive heart failure, I501 - Left ventricular failure, I509 - Heart failure, unspecified.

### **CVD I20-I25**

I200 - Unstable angina, I201 - Angina pectoris with documented spasm, I208 - Other forms of angina pectoris, I209 - Angina pectoris, unspecified, I210 - Acute transmural myocardial

infarction of anterior wall, I211 - Acute transmural myocardial infarction of inferior wall, I212 - Acute transmural myocardial infarction of other sites, I213 - Acute transmural myocardial infarction of unspecified site, I214 - Acute subendocardial myocardial infarction, I219 - Acute myocardial infarction, unspecified, I220 - Subsequent myocardial infarction of anterior wall, I221 - Subsequent myocardial infarction of inferior wall, I228 - Subsequent myocardial infarction of other sites, I229 - Subsequent myocardial infarction of unspecified site, I230 - Haemopericardium as current complication following acute myocardial infarction, I231 - Atrial septal defect as current complication following acute myocardial infarction, I232 - Ventricular septal defect as current complication following acute myocardial infarction, I233 - Rupture of cardiac wall without haemopericardium as current complication following acute myocardial infarction, I234 - Rupture of chordae tendineae as current complication following acute myocardial infarction, I235 - Rupture of papillary muscle as current complication following acute myocardial infarction, I236 - Thrombosis of atrium, auricular appendage, and ventricle as current complications following acute myocardial infarction, I238 - Other current complications following acute myocardial infarction, I240 - Coronary thrombosis not resulting in myocardial infarction, I241 - Dressler's syndrome, I248 - Other forms of acute ischaemic heart disease, I249 - Acute ischaemic heart disease, unspecified, I250 - Atherosclerotic cardiovascular disease, so described, I251 - Atherosclerotic heart disease, I252 - Old myocardial infarction, I253 - Aneurysm of heart, I254 - Coronary artery aneurysm, I255 - Ischaemic cardiomyopathy, I256 - Silent myocardial ischaemia, I258 - Other forms of chronic ischaemic heart disease, I259 - Chronic ischaemic heart disease, unspecified