Key findings about the outcomes for people with diabetes in NHS Gloucestershire CCG
The National Diabetes Audit is commissioned by:

The Healthcare Quality Improvement Partnership (HQIP)
The National Diabetes Audit is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit Programme (NCA). HQIP is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices. Its aim is to promote quality improvement, and in particular to increase the impact that clinical audit has on healthcare quality in England and Wales. HQIP holds the contract to manage and develop the NCA Programme, comprising more than 30 clinical audits that cover care provided to people with a wide range of medical, surgical and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual audits, also funded by the Health Department of the Scottish Government, DHSSPS Northern Ireland and the Channel Islands.

The National Diabetes Audit is delivered by:

The Health and Social Care Information Centre (HSCIC) is England’s central, authoritative source of essential data and statistical information for frontline decision makers in health and social care. The HSCIC managed the publication of the 2012-2013 reports.

Diabetes UK is the largest organisation in the UK working for people with diabetes, funding research, campaigning and helping people live with the condition.

The National Diabetes Audit is supported by:

The national cardiovascular intelligence network (NCVIN) is a partnership of leading national cardiovascular organisations which analyses information and data and turns it into meaningful timely health intelligence for commissioners, policy makers, clinicians and health professionals to improve services and outcomes.
Introduction

The National Diabetes Audit is commissioned by The Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit Programme (NCA). The NDA is managed by the Health and Social Care Information Centre (HSCIC) in partnership with Diabetes UK and supported by Public Health England.

This report presents key findings on complications in 2010-2013 in NHS Gloucestershire CCG. For further information, including NDA methodology and national summary reports, please visit the NDA website:

www.hscic.gov.uk/nda

Quality information is essential to any organisation responsible for implementing the many evidence based national diabetes policies such as the Diabetes National Service Framework (NSF), National Institute for Health and Care Excellence (NICE) Clinical Guidelines for diabetes and the NICE Diabetes in Adults Quality Standards. The NDA supports care quality improvement by enabling NHS organisations to:

- Compare the NICE specified processes and outcomes of care with similar NHS organisations.
- Provide a local health economy view of the care and outcomes delivered jointly by primary and secondary care organisations.
- Monitor progress towards delivering evidence based care standards (Diabetes NSF and NICE guidelines).
- Identify and share good practice.
- Identify gaps or shortfalls in commissioned services.

Preventing diabetic complications and reducing additional mortality due to diabetes is a long term endeavor. The results in this report will in large part reflect the effectiveness of diabetes care for people with diabetes in NHS Gloucestershire CCG during the past decade.

Complications of diabetes are the most costly part of the condition both to patients, who incur ill health and disability, and to the NHS as reflected in hospital utilization. This report contains not only complication rates compared with other CCGs but hospital admission rates linked to the complications.

The national report is beginning to see improvements in diabetes outcome rates but this is against a backdrop of rising diabetes incidence. Reducing the future burden of diabetes on patients and the NHS depends on preventing the onset of diabetes and optimizing the fundamentals of care.

Meanwhile, these local reports advocate better systems of care for people who develop coronary artery disease, heart failure, stroke, diabetic foot disease and diabetic kidney disease. They can substantially reduce disability, hospital admissions and premature death. As highlighted in the national report Heart Failure should be a priority for most CCGs. Heart failure has a very large impact because of the large numbers of people with Heart Failure, its high rates of hospital admission and its contribution to early death.

It is recommended that every CCG review these results and incorporate their implications into the local diabetes strategy.
Recommendations for Commissioners

The healthcare cost of diabetes is driven by the cost of complications. Complications drive the large numbers of hospital admissions for people with diabetes. Review how your CCG compares with others. Are there differences that merit strategic review of diabetes services?
Complication Ratios in NHS Gloucestershire CCG

This report contains the complications data from the three year follow up period for the 2009-2010 NDA data for NHS Gloucestershire CCG.

It is important to act upon this information. No health economy can afford to be complacent about diabetes and diabetic complications because even in the best performing health economies the health burden of diabetes is enormous. It is recommended that every CCG and LHB use these reports to prioritise local improvement efforts across all General Practice and Specialist Care providers. Action plans should aim to better achieve the NICE guidance found at: www.nice.org.uk/cg87; www.nice.org.uk/cg15; www.nice.org.uk/cg108.

Data from people with diabetes submitted to the 2009-2010 NDA and still alive on 31 March 2010 were matched to the Hospital Episode Statistics (HES)/Patient Episode Data for Wales (PEDW), for the period 1 April 2010 to 31 March 2013 (three year follow up period).

The prevalence of each complication was calculated as the number of people alive of the 31 March 2010 who had one or more hospital admissions with a relevant complication in the three year follow up period between 1 April 2010 and 31 March 2013.

Many of the complications of diabetes are more common in males and older people. As a result, the age and sex structure of the population with diabetes will influence the number of people with complications. The impact of the age and sex structure of the population can be removed by standardisation, allowing robust comparisons between different CCGs and LHBs. Apart from diabetic ketoacidosis, which is unique to diabetes, and chronic kidney disease, the standardised ratios presented here report the excess risk of complications due to diabetes. The calculations compare the complication prevalence for people with diabetes with the prevalence in the general population in the same CCG or LHB after adjustment for age and sex.

All standardised ratios in this report have been tested for statistical significance at the 95 per cent confidence interval; i.e. there is a 1 in 20 chance that the statements made in this report are untrue.

Therefore, in this report:

- **Lower than national**: the result for people with diabetes in NHS Gloucestershire CCG is statistically significantly lower ($p<0.05$) than in England and Wales.

- **As national**: the result for people with diabetes in NHS Gloucestershire CCG is not statistically significantly different than in England and Wales.

- **Higher than national**: the result for people with diabetes in NHS Gloucestershire CCG is statistically significantly higher ($p<0.05$) than in England and Wales.
Impact on secondary care in NHS Gloucestershire CCG

A new section has been added to the National Report which provides information about the impact on hospital admissions of episodes of care attributable to complications in people with diabetes. A chart detailing the percentage of Finished Consultant Episodes (FCE) attributed to NDA patients of all FCE in HES/PEDW has been added to each complication section.

These hospital utilization charts highlight the direct cost of these complications to the NHS and should serve as a guide to the diabetic complications better prevention or management of which would yield the greatest resource management gains.

These charts use Finished Consultant Episodes (FCE). A Consultant Episode is the time a patient spends in the continuous care of one consultant. If a patient transfers from one consultant to another within a single Hospital Provider Spell, for example moves to a ward with a specific specialty and is treated by a new consultant, one Consultant Episode will end and another one begin. So patients may have more than one finished consultant episode during a single hospital stay.
The standardised diabetic complications ratios NHS Gloucestershire CCG and for England and Wales are shown in Table 1.

A red, amber, green scale has been used in Table 1 to illustrate whether NHS Gloucestershire CCG is significantly above, below or within the expected range for each complication when compared to England and Wales.

### Table 1: Standardised ratios for diabetic complications for NHS Gloucestershire CCG and England and Wales, comparing people with diabetes to those without diabetes*, three year follow up period, 2009-2010 audit

<table>
<thead>
<tr>
<th>Complication</th>
<th>Total expected</th>
<th>Observed</th>
<th>Standardised ratio</th>
<th>95% confidence interval limits</th>
<th>Additional risk of complication among people with diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
<td>Upper</td>
<td></td>
</tr>
<tr>
<td>Angina</td>
<td>NHS Gloucestershire CCG</td>
<td>698</td>
<td>1,804</td>
<td>258</td>
<td>247 271</td>
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<tr>
<td></td>
<td>England and Wales</td>
<td>65,295</td>
<td>153,866</td>
<td>236</td>
<td>234 237</td>
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<tr>
<td>Myocardial Infarction</td>
<td>NHS Gloucestershire CCG</td>
<td>277</td>
<td>608</td>
<td>219</td>
<td>202 237</td>
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<tr>
<td></td>
<td>England and Wales</td>
<td>20,850</td>
<td>43,283</td>
<td>208</td>
<td>206 210</td>
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<tr>
<td>Heart Failure</td>
<td>NHS Gloucestershire CCG</td>
<td>535</td>
<td>1,302</td>
<td>243</td>
<td>230 257</td>
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<tr>
<td></td>
<td>England and Wales</td>
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<td>114,563</td>
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<td>247 250</td>
</tr>
<tr>
<td>Stroke</td>
<td>NHS Gloucestershire CCG</td>
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<td>578</td>
<td>186</td>
<td>171 202</td>
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<td>England and Wales</td>
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<td>179 182</td>
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<td>Major Amputation</td>
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<td>69</td>
<td>600</td>
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<td>England and Wales</td>
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<td>526 557</td>
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<tr>
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<td>1,258 1,706</td>
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<tr>
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<td>England and Wales</td>
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<td>843</td>
<td>825 861</td>
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<td>Renal Replacement</td>
<td>NHS Gloucestershire CCG</td>
<td>52</td>
<td>170</td>
<td>325</td>
<td>278 377</td>
</tr>
<tr>
<td>Therapy</td>
<td>England and Wales</td>
<td>5,117</td>
<td>20,005</td>
<td>391</td>
<td>386 396</td>
</tr>
</tbody>
</table>

* People classed as not having diabetes are those people not identified as having diabetes as part of the National Diabetes Audit and therefore this may contain people diagnosed with diabetes that are not participants in the audit.

b These figures are based on the number of people who appeared in the 2009-2010 audit with one or more complication event between 1 April 2010 to 31 March 2013.

c For definitions, please refer to the glossary.

* Where values are shown as * (an asterisk), the data have been suppressed for reasons of statistical and information governance.
Angina

Figure 1 shows the spread of standardised ratios for angina for all CCGs/LHBs. The result for NHS Gloucestershire CCG is highlighted in red and is higher than expected when compared against the national level for people with diabetes.

**Figure 1: Chart showing the spread of standardised ratios for angina in people with diabetes in CCGs and LHBs**

The additional risk of angina in people with diabetes in NHS Gloucestershire CCG is 158.4 per cent higher than in the general population of NHS Gloucestershire CCG. This risk of angina in people with diabetes is statistically significantly higher than in people with diabetes in England and Wales ($p<0.05$). It is recommended that NHS Gloucestershire CCG makes a priority of reviewing the approach of its Diabetes Care Providers to angina risk reduction, including exercise, diet composition, weight management, smoking, glucose control, blood pressure control and cholesterol control (www.nice.org.uk/cg87; www.nice.org.uk/cg15).
Figure 2 shows the estimate from the 2011-2012 NDA for all CCGs/LHBs of the percentage of all Finished Consultant Episodes (FCE) for angina in 2012-2013 that are in people diagnosed with diabetes. The result for NHS Gloucestershire CCG is highlighted in red and is 25.7 per cent. This is compared to the England and Wales result which is 23.6 per cent.

**Figure 2: Chart showing the estimate from the NDA of the percentage of all FCEs\(^a\) for angina that are in people with diabetes in CCGs and LHBs**

\(^a\) Finished Consultant Episodes (FCE). A Consultant Episode is the time a patient spends in the continuous care of one consultant. If a patient transfers from one consultant to another within a single Hospital Provider Spell, for example moves to a ward with a specific specialty and is treated by a new consultant, one Consultant Episode will end and another one begin. So patients may have more than one finished consultant episode during a single hospital stay.

\(^b\) NDA episodes are from all patients registered with GP Practices that participated in the audit in the 2011-2012 audit, please bear in mind that participation for the 2011-2012 audit was 87.9 per cent and there was a large variation across CCG’s and LHB’s.
**Myocardial Infarction**

Due to low numbers of admissions to hospital for myocardial infarction, the random play of numbers means that the recorded ‘additional risk’ of myocardial infarction in people with diabetes can be zero or less. It is expected that when measured over a longer period the reported results will come closer to the national average.

Figure 3 shows the spread of standardised ratios for myocardial infarction for all CCGs/LHBs. The result for NHS Gloucestershire CCG is highlighted in red and is as expected when compared against the national level for people with diabetes.

**Figure 3: Chart showing the spread of standardised ratios for myocardial infarction in people with diabetes in CCGs and LHBs**

The additional risk of admission to hospital with myocardial infarction for England and Wales is 107.6 per cent higher for people with diabetes than in the general population so it is an area for health improvement that should be considered by all health economies. The additional risk of myocardial infarction in people with diabetes in NHS Gloucestershire CCG is 119.2 per cent higher than in the general population of NHS Gloucestershire CCG. It is recommended that NHS Gloucestershire CCG reviews the approach of its Diabetes Care Providers to myocardial infarction risk reduction, including exercise, diet composition, weight management, smoking, glucose control, blood pressure control and cholesterol control ([www.nice.org.uk/cg87](http://www.nice.org.uk/cg87); [www.nice.org.uk/cg15](http://www.nice.org.uk/cg15)).
Figure 4 shows the estimate from the NDA for all CCGs/LHBs of the percentage of all FCEs for myocardial infarction that are in people diagnosed with diabetes. The result for NHS Gloucestershire CCG is highlighted in red and is 21 per cent. This is compared to the England and Wales result which is 19.6 per cent.

**Figure 4: Chart showing the estimate from the NDA of the percentage of all FCEs for myocardial infarction that are in people with diabetes in CCGs and LHBs**

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*a* Finished Consultant Episodes (FCE). A Consultant Episode is the time a patient spends in the continuous care of one consultant. If a patient transfers from one consultant to another within a single Hospital Provider Spell, for example moves to a ward with a specific specialty and is treated by a new consultant, one Consultant Episode will end and another one begin. So patients may have more than one finished consultant episode during a single hospital stay.

*b* Due to low numbers, the results for a number of CCGs/LHBs have been suppressed for reasons of statistical and information governance. The results for these CCGs/LHBs appear as a zero value on this figure.

*c* NDA episodes are from all patients registered with GP Practices that participated in the audit in the 2011-2012 audit, please bear in mind that participation for the 2011-2012 audit was 87.9 per cent and there was a large variation across CCG’s and LHB’s.
**Heart Failure**

Figure 5 shows the spread of standardised ratios for heart failure for all CCGs/LHBs. The result for NHS Gloucestershire CCG is highlighted in red and is as expected when compared against the national level for people with diabetes.

**Figure 5: Chart showing the spread of standardised ratios for heart failure in people with diabetes in CCGs and LHBs**

![Chart showing the spread of standardised ratios for heart failure in people with diabetes in CCGs and LHBs](image)

The additional risk of admission to hospital with heart failure for England and Wales is 148.2 per cent higher for people with diabetes than in the general population so it is an area for health improvement that should be considered by all health economies. The additional risk of heart failure in people with diabetes in NHS Gloucestershire CCG is 143.4 per cent higher than in the general population of NHS Gloucestershire CCG. It is recommended that NHS Gloucestershire CCG reviews the approach of its Diabetes and Cardiology Care Providers to heart failure risk reduction, including exercise, diet composition, weight management, smoking, glucose control, blood pressure control and cholesterol control ([www.nice.org.uk/cg87](http://www.nice.org.uk/cg87); [www.nice.org.uk/cg15](http://www.nice.org.uk/cg15)) and to the management of heart failure according to NICE guidance ([www.nice.org.uk/cg108](http://www.nice.org.uk/cg108)).
Figure 6 shows the estimate from the 2011-2012 NDA for all CCGs/LHBs of the percentage of all hospital episodes for heart failure in 2012-2013 that are in people diagnosed with diabetes. The result for NHS Gloucestershire CCG is highlighted in red and is 22.2 per cent. This is compared to the England and Wales result which is 24.1 per cent.

**Figure 6: Chart showing the estimate from the NDA of the percentage of all FCEs\(^a\) for heart failure that are in people with diabetes in CCGs and LHBs**

\[\text{Percentage of NDA episodes, CCG/LHB} \]

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\(^a\) Finished Consultant Episodes (FCE). A Consultant Episode is the time a patient spends in the continuous care of one consultant. If a patient transfers from one consultant to another within a single Hospital Provider Spell, for example moves to a ward with a specific specialty and is treated by a new consultant, one Consultant Episode will end and another one begin. So patients may have more than one finished consultant episode during a single hospital stay.

\(^b\) NDA episodes are from all patients registered with GP Practices that participated in the audit in the 2011-2012 audit, please bear in mind that participation for the 2011-2012 audit was 87.9 per cent and there was a large variation across CCG’s and LHB’s.
Stroke

Due to low numbers of admissions to hospital for stroke, the random play of numbers means that the recorded ‘additional risk’ of stroke in people with diabetes can be zero or less. It is expected that when measured over a longer period the reported results will come closer to the national average.

Figure 7 shows the spread of standardised ratios for stroke for all CCGs/LHBs. The result for NHS Gloucestershire CCG is highlighted in red and is as expected when compared against the national level for people with diabetes.

**Figure 7: Chart showing the spread of standardised ratios for stroke in people with diabetes in CCGs and LHBs**

The additional risk of stroke for England and Wales is 80.6 per cent higher for people with diabetes than in the general population so it is an area for health improvement that should be considered by all health economies. The additional risk of stroke in people with diabetes in NHS Gloucestershire CCG is 85.9 per cent higher than in the general population of NHS Gloucestershire CCG. It is recommended that NHS Gloucestershire CCG reviews the approach of its Diabetes and Cardiology Care Providers to stroke risk reduction, including exercise, diet composition, weight management, smoking, glucose control, blood pressure control and cholesterol control (www.nice.org.uk/cg87; www.nice.org.uk/cg15).
Figure 8 shows the estimate from the 2011-2012 NDA for all CCGs/LHBs of the percentage of all FCEs for stroke in 2012-2013 that are in people diagnosed with diabetes. The result for NHS Gloucestershire CCG is highlighted in red and is 18.7 per cent. This is compared to the England and Wales result which is 17.1 per cent.

**Figure 8: Chart showing the estimate from the NDA of the percentage of all FCEs\(^a\) for stroke that are in people with diabetes in CCGs and LHBs\(^b\)**

\(^a\) Finished Consultant Episodes (FCE). A Consultant Episode is the time a patient spends in the continuous care of one consultant. If a patient transfers from one consultant to another within a single Hospital Provider Spell, for example moves to a ward with a specific speciality and is treated by a new consultant, one Consultant Episode will end and another one begin. So patients may have more than one finished consultant episode during a single hospital stay.

\(^b\) Due to low numbers, the results for a number of CCGs/LHBs have been suppressed for reasons of statistical and information governance. The results for these CCGs/LHBs appear as a zero value on this figure.

\(^c\) NDA episodes are from all patients registered with GP Practices that participated in the audit in the 2011-2012 audit, please bear in mind that participation for the 2011-2012 audit was 87.9 per cent and there was a large variation across CCG’s and LHB’s.
Major Amputation

Figure 9 shows the spread of standardised ratios for major amputation for all CCGs/LHBs. The result for NHS Gloucestershire CCG is highlighted in red and is as expected when compared against the national level for people with diabetes.

**Figure 9: Chart showing the spread of standardised ratios for major amputation\(^a\) in people with diabetes in CCGs and LHBs**

The additional risk of having a major amputation in people with diabetes is 441.5 per cent than in the general population so it is an area for health improvement that should be considered by all health economies. The additional risk of having a major amputation in people with diabetes in NHS Gloucestershire CCG is 499.8 per cent higher than in the general population of NHS Gloucestershire CCG. It is recommended that NHS Gloucestershire CCG makes a priority of reviewing the approach of its Diabetes Care Providers to the whole foot disease prevention pathway (see below) but particularly to the provision of urgent care pathways for people with new diabetic foot disease including a multidisciplinary foot care team (NICE CG 10 and CG 119).

- Risk reduction of peripheral vascular disease and neuropathy using exercise, diet composition, weight management, smoking, glucose control, blood pressure control and cholesterol control.
- Early identification of people at increased risk of diabetic foot disease using annual foot surveillance of circulation, sensation and risk stratification.
- In those who are screen positive, intensive preventive management within a foot care protection programme.
- Prompt identification of new foot disease and its urgent referral to a multidisciplinary specialist diabetic foot team.
- See [www.nice.org.uk/cg87](http://www.nice.org.uk/cg87); [www.nice.org.uk/cg15](http://www.nice.org.uk/cg15); [www.nice.org.uk/cg119](http://www.nice.org.uk/cg119)

\(^a\) Due to low numbers, the results for a number of CCGs/LHBs have been suppressed for reasons of statistical and information governance. The results for these CCGs/LHBs appear as a zero value on this figure.
Figure 10 shows the estimate from the 2011-2012 NDA for all CCGs/LHBs of the percentage of all FCEs for major amputation in 2012-2013 that are in people diagnosed with diabetes. The result for NHS Gloucestershire CCG is highlighted in red and is 45.5 per cent. This is compared to the England and Wales result which is 36 per cent.

**Figure 10: Chart showing the estimate from the NDA of the percentage of all FCEs\(^a\) for major amputation that are in people with diabetes in CCGs and LHBs\(^b\)**

\(^a\) Finished Consultant Episodes (FCE). A Consultant Episode is the time a patient spends in the continuous care of one consultant. If a patient transfers from one consultant to another within a single Hospital Provider Spell, for example moves to a ward with a specific specialty and is treated by a new consultant, one Consultant Episode will end and another one begin. So patients may have more than one finished consultant episode during a single hospital stay.

\(^b\) Due to low numbers, the results for a number of CCGs/LHBs have been suppressed for reasons of statistical and information governance. The results for these CCGs/LHBs appear as a zero value on this figure.

\(^c\) NDA episodes are from all patients registered with GP Practices that participated in the audit in the 2011-2012 audit, please bear in mind that participation for the 2011-2012 audit was 87.9 per cent and there was a large variation across CCG’s and LHB’s.
Minor Amputation

Figure 11 shows the spread of standardised ratios for minor amputation for all CCGs/LHBs. The result for NHS Gloucestershire CCG is highlighted in red and is higher than expected when compared against the national level for people with diabetes.

Figure 11: Chart showing the spread of standardised ratios for minor amputation in people with diabetes in CCGs and LHBs

Due to low numbers, the results for a number of CCGs/LHBs have been suppressed for reasons of statistical and information governance. The results for these CCGs/LHBs appear as a zero value on this figure.

The additional risk of having a minor amputation in people with diabetes in NHS Gloucestershire CCG is 1369.0 per cent higher than in the general population of NHS Gloucestershire CCG. This risk of minor amputation among all people with diabetes in NHS Gloucestershire CCG is statistically significantly higher than in people with diabetes in England and Wales ($p<0.05$). It is recommended that NHS Gloucestershire CCG should make a priority of reviewing the approach of its Diabetes Care Providers to the whole foot disease prevention pathway (see below) but particularly to the provision of urgent care pathways for people with new diabetic foot disease including a multidisciplinary foot care team (NICE CG 10 and CG 119).

- Risk reduction of peripheral vascular disease and neuropathy using exercise, diet composition, weight management, smoking, glucose control, blood pressure control and cholesterol control.
- Early identification of people at increased risk of diabetic foot disease using annual foot surveillance of circulation, sensation and risk stratification.
- In those who are screen positive, intensive preventive management within a foot care protection programme.
- Prompt identification of new foot disease and its urgent referral to a multidisciplinary specialist diabetic foot team.
- See [www.nice.org.uk/cg87](http://www.nice.org.uk/cg87); [www.nice.org.uk/cg15](http://www.nice.org.uk/cg15); [www.nice.org.uk/cg119](http://www.nice.org.uk/cg119)
Figure 12 shows the estimate from the 2011-2012 NDA for all CCGs/LHBs of the percentage of all FCEs for minor amputation in 2012-2013 that are in people diagnosed with diabetes. The result for NHS Gloucestershire CCG is highlighted in red and is 66.7 per cent. This is compared to the England and Wales result which is 50.5 per cent.

**Figure 12: Chart showing the estimate from the NDA of the percentage of all FCEs for minor amputation that are in people with diabetes in CCGs and LHBs**

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**a** Finished Consultant Episodes (FCE). A Consultant Episode is the time a patient spends in the continuous care of one consultant. If a patient transfers from one consultant to another within a single Hospital Provider Spell, for example moves to a ward with a specific specialty and is treated by a new consultant, one Consultant Episode will end and another one begin. So patients may have more than one finished consultant episode during a single hospital stay.

**b** Due to low numbers, the results for a number of CCGs/LHBs have been suppressed for reasons of statistical and information governance. The results for these CCGs/LHBs appear as a zero value on this figure.

**c** NDA episodes are from all patients registered with GP Practices that participated in the audit in the 2011-2012 audit, please bare in mind that participation for the 2011-2012 audit was 87.9 per cent and there was a large variation across CCG’s and LHB’s.
Renal Replacement Therapy

Figure 13 shows the spread of standardised ratios for renal replacement therapy for all CCGs/LHBs. The result for NHS Gloucestershire CCG is highlighted in red and is lower than expected when compared against the national level for people with diabetes.

**Figure 13: Chart showing the spread of standardised ratios for renal replacement therapy in people with diabetes in CCGs and LHBs**

Though NHS Gloucestershire CCG has a statistically significantly lower than expected number of people with diabetes recorded as undergoing renal replacement therapy with dialysis or transplantation than as compared with people with diabetes in England and Wales ($p<0.05$), the additional risk of renal replacement therapy in people with diabetes in NHS Gloucestershire CCG is still 224.7 per cent higher than in the general population of NHS Gloucestershire CCG and therefore it is an area for health improvement that should be considered. If NHS Gloucestershire CCG has already successfully implemented any diabetic kidney disease prevention measures that it would be willing to share with other providers that would be much appreciated. Please email diabetes@hscic.gov.uk.
Figure 14 shows the estimate from the 2011-2012 NDA for all CCGs/LHBs of the percentage of all FCEs for renal replacement therapy in 2012-2013 that are in people diagnosed with diabetes. The result for NHS Gloucestershire CCG is highlighted in red and is 23.1 per cent. This is compared to the England and Wales result which is 30.5 per cent.

**Figure 14: Chart showing the estimate from the NDA of the percentage of all FCEs\(^a\) for renal replacement therapy that are in people with diabetes in CCGs and LHBs**

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\(^a\) Finished Consultant Episodes (FCE). A Consultant Episode is the time a patient spends in the continuous care of one consultant. If a patient transfers from one consultant to another within a single Hospital Provider Spell, for example moves to a ward with a specific specialty and is treated by a new consultant, one Consultant Episode will end and another one begin. So patients may have more than one finished consultant episode during a single hospital stay.

\(^b\) NDA episodes are from all patients registered with GP Practices that participated in the audit in the 2011-2012 audit, please bear in mind that participation for the 2011-2012 audit was 87.9 per cent and there was a large variation across CCG’s and LHB’s.
**Diabetic Ketoacidosis**

Standardised ratios for the prevalence of hospital admissions for diabetic ketoacidosis have been calculated for all CCGs and LHBs. These adjust for the age and sex of the local populations with type 1 diabetes and assess the prevalence of diabetic ketoacidosis compared with all people with type 1 diabetes in England and Wales.

The standardised diabetic ketoacidosis ratios for NHS Gloucestershire CCG and for England and Wales are shown in Table 2.

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<td>As national</td>
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<td>Lower than national</td>
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<td>Data has been suppressed</td>
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</table>

A red, amber, green scale has been used in Table 2 to illustrate whether NHS Gloucestershire CCG is significantly above, below or within the expected range for diabetic ketoacidosis when compared to all people with type 1 diabetes in England and Wales.

**Table 2: Standardised ratios for diabetic ketoacidosis for NHS Gloucestershire CCG**

<table>
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<tr>
<th>Diabetic Ketoacidosis&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Total expected&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Observed</th>
<th>Standardised ratio&lt;sup&gt;a&lt;/sup&gt;</th>
<th>95% confidence interval limits&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS Gloucestershire CCG</td>
<td>172</td>
<td>159</td>
<td>92</td>
<td>79</td>
<td>79</td>
<td>108</td>
</tr>
<tr>
<td>People with type 1 diabetes in England and Wales</td>
<td>14,240</td>
<td>14,240</td>
<td>100</td>
<td>98</td>
<td>98</td>
<td>102</td>
</tr>
</tbody>
</table>

<sup>a</sup> For definitions, please refer to the glossary.

<sup>b</sup> Diabetic ketoacidosis values represent people with type 1 diabetes only.

* Where values are shown as * (an asterisk), the data have been suppressed for reasons of statistical and information governance.

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Diabetic Ketoacidosis

The standardised diabetic ketoacidosis ratios for NHS Gloucestershire CCG and for England and Wales are shown in Table 2. A red, amber, green scale has been used in Table 2 to illustrate whether NHS Gloucestershire CCG is significantly above, below or within the expected range for diabetic ketoacidosis when compared to all people with type 1 diabetes in England and Wales.

**Table 2: Standardised ratios for diabetic ketoacidosis for NHS Gloucestershire CCG**

<table>
<thead>
<tr>
<th>Diabetic Ketoacidosis&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Total expected&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Observed</th>
<th>Standardised ratio&lt;sup&gt;a&lt;/sup&gt;</th>
<th>95% confidence interval limits&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Lower</th>
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</tbody>
</table>

<sup>a</sup> For definitions, please refer to the glossary.

<sup>b</sup> Diabetic ketoacidosis values represent people with type 1 diabetes only.

* Where values are shown as * (an asterisk), the data have been suppressed for reasons of statistical and information governance.
Figure 15 shows the spread of standardised ratios for diabetic ketoacidosis for all CCGs/LHBs. The result for NHS Gloucestershire CCG is highlighted in red and is as expected when compared against the national level for people with type 1 diabetes.

**Figure 15: Chart showing the spread of standardised ratios for diabetic ketoacidosis\(^a\) in people with type 1 diabetes in CCGs and LHBs**

\(^a\) Due to low numbers, the results for a number of CCGs/LHBs have been suppressed for reasons of statistical and information governance. The results for these CCGs/LHBs appear as a zero value on this figure.

The number of people with type 1 diabetes being admitted to hospital for diabetic ketoacidosis in NHS Gloucestershire CCG is as expected when compared to people with type 1 diabetes in England and Wales. However, diabetic ketoacidosis has been increasing over the whole of England and Wales and there is an imperative to reduce the rate of this largely preventable cause of serious illness everywhere. Therefore, it is recommended that NHS Gloucestershire CCG reviews the approach of its Diabetes Care Providers to the prevention of diabetic ketoacidosis, specifically focusing on the services and support for young people with type 1 diabetes.
Mortality

Data from people included in the 2009-2010, 2010-2011 and 2011-2012 NDA and still alive on the 31 December after the audit period (e.g. to be included a person from the 2009-2010 audit would still be alive on 31 December 2010) were linked to data from the Medical Research Information Service (MRIS) to identify those who died between 1 January 2011 and 31 December 2013.

Table 3 shows the mortality in people with diabetes in England and Wales in 2009-2012 NDA by CCG/LHB. This was calculated using three cohorts of patients appearing in the NDA and using a one year mortality period follow up. Mortality is driven by vascular and kidney complications. It is likely that it takes at least five to ten years of improvement in the fundamentals of diabetes care (9 care process completion, 3 treatment target achievement rates) to improve complications and mortality so that these results will reflect care during the past decade.

Table 3: Mortality in people with diabetes for NHS Gloucestershire CCG

<table>
<thead>
<tr>
<th></th>
<th>Person Years at Risk (PYaR)*</th>
<th>Expected Deaths*</th>
<th>Observed Deaths</th>
<th>Standardised mortality ratio (SMR)*</th>
<th>95% confidence interval limits*</th>
<th>Additional risk of death among people with diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>All diabetes</td>
<td>82,586</td>
<td>2,192</td>
<td>3065</td>
<td>140</td>
<td>135-145</td>
<td>+39.8%</td>
</tr>
<tr>
<td>England and Wales</td>
<td>6,458,705</td>
<td>160,640</td>
<td>223,674</td>
<td>139</td>
<td>139-140</td>
<td>+39.2%</td>
</tr>
<tr>
<td>Type 1 diabetes</td>
<td>7,669</td>
<td>55</td>
<td>139</td>
<td>255</td>
<td>214-301</td>
<td>+154.7%</td>
</tr>
<tr>
<td>England and Wales</td>
<td>588,024</td>
<td>4,179</td>
<td>9,883</td>
<td>237</td>
<td>232-241</td>
<td>+136.5%</td>
</tr>
<tr>
<td>Type 2 diabetes</td>
<td>74,209</td>
<td>2,118</td>
<td>2899</td>
<td>137</td>
<td>132-142</td>
<td>+36.9%</td>
</tr>
<tr>
<td>England and Wales</td>
<td>5,749,936</td>
<td>153,767</td>
<td>209,525</td>
<td>136</td>
<td>136-137</td>
<td>+36.3%</td>
</tr>
</tbody>
</table>

* For definitions, please refer to the glossary.
* Where values are shown as * (an asterisk), the data have been suppressed for reasons of statistical and information governance.

A red, amber, green scale has been used in Table 3 to illustrate whether NHS Gloucestershire CCG is significantly above, below or within the expected range for mortality when compared to England and Wales.

RAG (Red-Amber-Green) Score Key
- Red: Higher than national
- Amber: As national
- Green: Lower than national
- Gray: Data has been suppressed
Figure 16 shows the spread of standardised mortality ratios for all diabetes types for all CCGs/LHBs. The result for NHS Gloucestershire CCG is highlighted in red and is as expected when compared against the national level for people with diabetes.

Figure 16: Chart showing the spread of standardised ratios for mortality in CCGs and LHBs
Glossary

Confidence Interval (CI)

A confidence interval is a range of values that quantifies the imprecision in the estimate of a statistic. Specifically it quantifies the imprecision that results from random variation in the estimation of the value; it does not include imprecision resulting from systematic error (bias). In public health many indicators are based on what can be considered to be complete data sets and not samples, e.g. mortality rates based on death registers. In these instances the imprecision arises not as a result of sampling variation but of ‘natural’ variation. The indicator is considered to be the outcome of a stochastic process, i.e. one which can be influenced by the random occurrences that are inherent in the world around us. In such instances the value actually observed is only one of the set that could occur under the same circumstances. Generally in public health, it is the underlying circumstances or process that is of interest and the actual value observed gives only an imprecise estimate of this underlying risk’.

The width of the confidence interval depends on three things:

- The sample or population size from which the estimate is derived.
- The degree of variability in the phenomenon being measured.
- The required level of confidence – this is an arbitrary value set to give the desired probability that the interval includes the true value. In medicine and public health the conventional practice is to use 95 per cent confidence.

For a given level of confidence, the wider the confidence interval, the greater the uncertainty in the estimate.

Population-years-at-risk (PYaR)

The population-years-at-risk is the total amount of time during which the population is exposed to a risk. For example, during the one-year mortality follow-up period a person who survives the whole year contributes one year to the total PYaR; a person who dies after 3 months contributes only 0.25 years to the total.

Standardised Mortality Ratio (SMR)

The SMR is a form of indirect standardisation. The age specific mortality rates of a chosen standard population (usually the relevant national or study aggregate population) are applied to the age structure of the subject population to give an expected number of deaths. The observed number of events is then compared to the expected and is usually expressed as a ratio (observed/expected). For presentation purposes, the SMR is usually expressed per 100. By definition, the standard population will have a SMR of 100. SMRs above 100 indicate that the death count observed was greater than that expected from the standard mortality rate and SMRs below 100 that it was lower.

Expected deaths

The expected death count is that which would occur if the observed subject population experienced the standard population’s age-specific mortality rates.
**Standardised Ratio**

The standardised ratio is a form of indirect standardisation. The age and sex specific rates for each complication of a chosen population (usually the relevant national or study aggregate population) are applied to the age and sex structure of the subject population to give an expected number of complications. The observed number of events is then compared to the expected and is usually expressed as ratio (observed/expected). For presentation purposes the standardised ratio is usually expressed per 100. By definition, the standard population will have a standardised ratio of 100. Standardised ratios above 100 indicate that the complication count observed was greater than that expected from the standardised complications rates and for standard ratios below 100 that it was lower.

**Expected complications**

The expected complication count is that which would occur if the observed subject population experienced the standard population’s age and sex specific complication rates.

**Suppression**

When the observed number of people with a particular complication in a CCG/LHB is between 1 and 5, the data for that particular complication for that CCG/LHB has been suppressed from publication for reasons of statistical and information governance.