

# National Diabetes Audit 2012–2013

## Report 1: Care Processes and Treatment Targets



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 the trusted source of authoritative data and information relating to health and care. The HSCIC managed the publication of the 2012 – 2013 report.



**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.

# National Diabetes Audit 2012–2013

## Report 1: Care Processes and Treatment Targets

Findings about the quality  
of care for people with diabetes  
in England and Wales

Report for the audit period 1st  
January 2012 to 31st March 2013

# Contents

Acknowledgements	05
Foreword	06
Executive Summary	08
Introduction	12
Participation	13
Registrations	14
Demographics	16
Care Processes	17
Treatment Targets	21
Structured Education	24
Data Completeness	25
NDA Methodology	26
Further Information	27
References	28
Appendix 1: Characteristics of people with diabetes	29
Appendix 2: Regression Analysis	31

# Acknowledgments

The National Diabetes Audit (NDA) programme, 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 is supported by Public Health England (PHE).

Throughout the audit there has been invaluable support from patients and their representatives, clinical staff and other health professionals.

Development and delivery of the NDA is guided by a multi-professional national group of Diabetologists, GPs, consultants, public health physicians, and service user representatives. The NDA is chaired by Dr Bob Young Consultant Diabetologist & CMIO, Clinical Lead NDA (National Diabetes Audit) & NCVIN (National Cardiovascular Intelligence Network).

Our thanks go to Catherine Sylvester, Andy Hayton and Trina Evans-Cheung at the HSCIC for producing the NDA analysis within this report.

## **The NDA Advisory Group members include:**

**Laura Fargher**  
NDA Engagement Manager

**Bob Young**  
Specialist Clinical Lead

**Naomi Holman**  
Head of Intelligence  
Public Health England

**Roger Gadsby**  
GP Clinical Lead

**Louise Dunn**  
Clinical Audit Manager

**Grant Price**  
Patient Representative

**Mo Roshan**  
Diabetes GP lead

**Heather Lindsay**  
Public Health Manager

**Sam Bentley**  
Patient Representative

**Linda Dewsbury**  
Diabetes Specialist Nurse

**Chris Mieszkowski**  
Patient Representative

**Partha Kar**  
Consultant Endocrinologist

**Gordon Dixon**  
Patient Representative

**Peter Davies**  
Consultant in Diabetes and Endocrinology

**Rustam Rea**  
Consultant Endocrinologist

**Shaida Tanweer**  
Audit Co-ordinator

**Raquel Delgado**  
Diabetes GP Lead

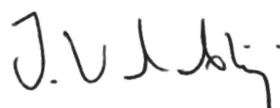
# Foreword

The National Diabetes Audit (NDA) continues to provide a comprehensive view of Diabetes Care in England and Wales despite the technical and organisational limitations encountered this year that have led to a drop in participation. 70.6 per cent of GP practices and 79 specialist services have been included capturing information on 2,058,321 people with diabetes.

Although there is opportunity for improvement everywhere and variation between localities and providers remains significant, the outstanding message from this report is the need to address the substantially worse routine care and treatment in younger people with Type 1 and Type 2 diabetes and in people with Type 1 diabetes at all ages. The NDA results have been consistent in highlighting this issue for several years which suggests that the current systems of care that work reasonably well for older people do not deliver the same benefits to younger people with diabetes especially for those aged less than 40 (approximately 130,000). Given the potential adverse consequences for these younger people of disability and premature mortality in middle life, designing better systems of care for them would yield considerable health benefits. This may be an important message for Clinical Commissioning Groups as they prepare to commission diabetes services in England, and for Local Health Boards in Wales.

Whatever the systems of care, successful partnership between those with diabetes and those that deliver care will remain central to improvements. Structured education provides people with the tools to manage their own diabetes. Unfortunately few seem to be offered structured education, and up to three-quarters of those offered do not manage to attend. We have to improve the delivery of structured education so that it is more available and accessible.

The recommendations of this report include improved delivery of structured education and improved care for younger people with diabetes, something that we hope can be developed successfully by providers and commissioners of diabetes services in England and Wales.



**Professor Jonathan Valabhji MD FRCP**

National Clinical Director for Obesity and Diabetes,  
NHS England

Consultant Physician, Diabetologist and Endocrinologist,  
Imperial College Healthcare NHS Trust

Adjunct Professor of Diabetes and Endocrinology,  
Imperial College London

# Recommendations

We recommend that all commissioners, all diabetes leads and all GP and Specialist providers of diabetes care review their results and consider one or more of the following actions:

- Review and encourage improvements to systems for providing structured education
- Review and improve systems for delivering effective care to younger people with Type 1 and Type 2 diabetes; learn from the best performers
- Encourage and support quality improvement approaches within the bottom 25 per cent of CCGs and practices to achieve all process and outcome age results, similar to the middle 50 per cent.

These recommendations are congruent with the NHS England Action for Diabetes<sup>1</sup> report published earlier this year.

# Executive Summary

The National Diabetes Audit (NDA) 2012-2013 Report 1: Care Processes and Treatment Targets, presents findings on care processes and treatment target achievement rates from 2012-2013.

The data in this report is based on:

- Data recorded on people with diagnosed diabetes in England and Wales from the 1st January 2012 to the 31st March 2013. The data was collected between October 2013 and January 2014
- Data recorded on people with all types of diabetes mellitus, excluding gestational diabetes, impaired glucose tolerance (IGT) and impaired fasting glucose (IFG)<sup>4</sup>. The Read codes used for the extraction are described in the 2012-2013 Primary Care Extraction Specification (PCES) available on the NDA website: [www.hscic.gov.uk/nda](http://www.hscic.gov.uk/nda)
- The prevalence and registration sections of the report are based on data collections from both primary and secondary care. The remainder of the report (including the appendices) includes only patients registered in primary care to ensure that the population based denominators are comparable. Results for individual CCGs and individual specialist care units will be published separately

- The NDA report 1 covers the provision of core diabetes care for everyone with diabetes. This provides clinical leads and commissioners with age, ethnicity and social deprivation related perspectives across the whole population for which they are responsible. The NDA also reports to participating individual General Practices and adult specialist services allowing them to benchmark their care against their peers. The NPDA (National Paediatric Diabetes Audit) reports separately to individual participating paediatric diabetes centres regarding their provision of diabetes care for the children and young people attending their services. Those reviewing the NDA and NPDA reports side by side need to be aware of these differences but, equally, those wanting to get the most complete picture of local needs and service provision should consider the two reports together.<sup>i</sup>

## Participation

- 2,058,321 people with diabetes in England and Wales; appreciably less than 2011-2012 (2,473,239) or 2010-2011 (2,235,810) due to factors noted below<sup>ii</sup>
- 70.6 per cent of practices in England and Wales (87.9 per cent in 2011-2012; 80.9 per cent in 2010-2011).

## People with Diabetes

- Diabetes prevalence is higher for men than women.

<sup>i</sup> Because the care of adults and children with diabetes is mixed between GP services (this includes ALL patients) and hospital, paediatric and community specialist services (these each include SOME patients), the different 'views' that the two national audits NDA and NPDA give to the providers of the services will inevitably include overlapping patients. Thus someone with diabetes attending a specialist service should also appear in the relevant GP report. The NDA integrates data from participating specialist and GP services for adults with diabetes so that if a care process or treatment target is recorded by one but not the other both get the complete data reported back to them i.e. a 'whole person' view. This makes sense because it reflects the fact that there is no clinical value in duplicating something carried out elsewhere. The population level NDA reports include all people with diabetes in a geographical area irrespective of their mix of provider services and use integrated data where they are available.

But NPDA runs independently of the NDA and of GP services so its data are not integrated making it possible that GP reports do not include all care processes or treatment targets measured in specialist paediatric units and vice versa. Specialist paediatric diabetes units are primarily responsible for the care of most children and young people with diabetes and for the collection of their care process and outcome data. Although GPs do not provide the majority of care for children and young people living with diabetes they do prescribe all their medications. Therefore it is in this age group, and also adults with Type 1 or complex diabetes that attend specialist services not participating in NDA, where lack of data integration is most likely to result in a slightly deficient 'whole systems' view. Furthermore, for under-17s, the age cut-off for the QOF GP incentive scheme means that there is no financial value to the practice in replicating results from external services. Nonetheless, because less than 10.0 per cent of all people with Type 1 diabetes, and less than 1.0 per cent of people with diabetes in general are under 17yr, the overall impact on population level NDA results is minimal.

<sup>ii</sup> The drop in participation in the NDA this year was expected due to the restructuring of the NHS starting in April 2013. This has left both challenges and opportunities for clinical audit but undoubtedly the organisational transition had disrupted many well established people and systems. The NDA also acknowledges the changes in the governance landscape along with the added pressures of significant numbers of GP practices moving clinical systems all which add to the complexities of primary care data extraction for national clinical audit.



## Care processes

- For each of the care processes, annual completion rates continue to plateau. In 2012-13, completion of eight care processes was 59.9 per cent, compared to 60.5 per cent in 2011-2012 and 60.6 per cent in 2010-2011

Recorded rates of completion for all eight care processes are:

- lower for people with Type 1 (41.3 per cent) than Type 2 diabetes (61.9 per cent) and remain lower even when other factors, such as age, gender, BMI, ethnicity and duration of diabetes are taken into account
- less likely to be achieved by those aged under 40 compared to older people for both Type 1 and Type 2 diabetes, with those with Type 1 diabetes showing a bigger difference
- Variable between localities; CCGs/LHBs in the bottom quarter of performers had completion rates 11.8 percentage points lower than those in the top quarter (55.4 per cent vs. 67.2 per cent) unrelated to social deprivation
- It is notable that only 16 per cent of people with diabetes are current smokers compared to the National Figure of 20 per cent<sup>iii</sup> 2.

## Treatment Targets

- Concurrent achievement of all three NICE recommended glucose, blood pressure and serum cholesterol levels remains at 35.9 per cent (35.9 per cent in 2011-2012; 33.7 per cent in 2010-2011)
- NICE recommended glucose control ( $HbA_{1c} \leq 58 \text{ mmol/mol}$ ) was recorded in 27.3 per cent of people with Type 1 diabetes and 64.8 per cent of people with Type 2 diabetes
- NICE recommended blood pressure ( $\leq 140/80$ ) was recorded in 73.4 per cent of people with Type 1 diabetes and 68.7 per cent of people with Type 2 diabetes (NB target BP in this NDA year includes Blood pressure less than or equal to 140/80 rather than just less than 140/80 as in previous reports<sup>iv</sup>)

- NICE recommended serum cholesterol  $<4 \text{ mmol/l}$  was recorded in 28.7 per cent of people with Type 1 diabetes and 40.5 per cent of people with Type 2 diabetes; serum cholesterol  $<5 \text{ mmol/l}$  (QOF incentivised) was recorded in 70.2 per cent of people with Type 1 diabetes and 76.8 per cent of people with Type 2 diabetes
- Concurrent achievement of all three NICE treatment targets ( $HbA_{1c} \leq 58 \text{ mmol/mol}$  + serum cholesterol  $<5 \text{ mmol/mol}$  + BP  $\leq 140/80$ ) was recorded for more patients in some CCGs/LHBs than others. Those CCGs/LHBs in the bottom quarter of performers were 3.8 percentage points lower than those in the top quarter (34.1 per cent vs. 37.9 per cent)
- Achievement of all three NICE recommended treatment targets show marked difference among the different age groups; as people get older or if they have Type 2 diabetes they are more likely to have achieved the treatment targets.

## Structured Education

- Very few people with diabetes are recorded as having been offered structured education. 3.9 per cent Type 1, 16.7 per cent Type 2 for those who are newly diagnosed and 2.4 per cent Type 1, 6.0 per cent Type 2 for all people with diabetes
- Even fewer people with diabetes are recorded as attending structured education. 0.9 per cent Type 1, 3.6 per cent Type 2 for those who are newly diagnosed and 1.1 per cent Type 1; 1.6 per cent Type 2 for all people with diabetes.

<sup>iii</sup> The NDA percentage Includes under 16s, England and Wales only and is not directly comparable to the National figure which covers over 16s only and Great Britain.

<sup>iv</sup> A paper detailing the changes to the methodology can be found <http://www.hscic.gov.uk/pubs/methchanges>  
This explains the impact of this change to the Blood Pressure Target and the All 3 Treatment Target figures.

## Comment

It is disappointing but understandable that the turbulence of the NHS reorganisation has undermined the comprehensiveness of this NDA report. This means that local reports will be less comprehensive but we believe that consistency with previous years in the high level results means that the national conclusions have not been adversely impacted. However we hope that GP system suppliers will have completed their upgrades and that local systems to ensure comprehensive data submission will have recovered in time for the next round in 2015 when the NDA will be endeavouring to publish 2014–2015 reports just 6 months after the end of the audit year in November 2015.

Nonetheless the 2012–2013 audit paints a picture that has become familiar in the past two or three years and which we believe should set the agenda for diabetes care improvement by every diabetes care provider, by every clinical lead for diabetes services and by every diabetes care commissioner. It is the continued finding that younger people with Type 1 or Type 2 diabetes and people with Type 1 diabetes at all ages less often receive all the annual care processes or achieve the basic treatment targets. Notable also is the continued low rate of offering and receiving structured diabetes education; this is a key foundation of effective self-care but presently seems to be assigned low priority.

This year the Blood Pressure target has been minimally modified from  $<140/80$  to  $\leq 140/80$  to align with the QOF target. We were surprised at the resulting size of the difference suggesting that Blood Pressure measurement may still be plagued by the long recognised issue of rounding (digit preference). We have previously highlighted in the NDA report 2 (2011–2012) how large the contribution of Heart Failure to premature mortality so Blood Pressure control is one of the most valuable components of routine diabetes care and it is therefore essential for it to be measured reliably.

This link between the effectiveness of routine care and complications is the basis of our concern about the age inequality in diabetes care. Though it may be common experience that it is much more difficult to support younger people and people with Type 1 diabetes because they often have diabetes that is inherently more difficult to manage and lives that are full of competing priorities the prize of success would be huge. Yet the amount of variation suggests that there are already some approaches from which we could all learn. Younger people with diabetes who are not achieving treatment targets contribute a disproportionate share of the burden of diabetes disability and premature mortality greater focus on designing services to make them more appropriately suited to the needs of those who are working, students, and living full lives needs to be considered.

These deductions are, we believe, reinforced by setting the audit results in the context of the key studies which shaped the guidelines on which the measurements are based.

# How does current diabetes care compare to landmark clinical studies?

Current guidelines for the management of Diabetes have been shaped by a number of landmark studies that identified the influence of blood glucose levels, blood pressure and statin medication in reducing the risk of macro and micro vascular complications. Differences between carefully selected trial populations and 'all people with diabetes' and between approaches to data presentation make direct assessments of current care with research studies difficult. However, broad comparisons between people in the NDA with similar characteristics to those recruited for the trials may help inform assessment of the achievements priorities for improvement in contemporary care programmes.

Between 1983 and 1989 people aged 13 to 39 years old with Type 1 diabetes of between one and 15 years duration were enrolled in the Diabetes Control and Complications Trial (DCCT). The findings of this trial and its follow on observational study, the Epidemiology of Diabetes Interventions and Complications (EDIC) study, highlighted the relationship between blood glucose levels and risk of micro-vascular disease (chronic kidney disease and retinopathy<sup>3</sup>). After an average follow up of six and a half years trial people allocated to conventional treatment (managing blood glucose levels to prevent symptoms) had a mean HbA<sub>1c</sub> of 76 mmol/mol (9.1 per cent) whilst those in the intensive treatment (aiming for a HbA<sub>1c</sub> in the normal range) group had a mean HbA<sub>1c</sub> of 56 mmol/mol (7.3 per cent<sup>4</sup>). A broadly comparable cohort of people with Type 1 diabetes from the 2012–2013 NDA cohort had a mean HbA<sub>1c</sub> of 72 mmol/mol (8.7 per cent).

The UK Prospective Diabetes Study (UKPDS) recruited people aged 25 to 65 years old with newly diagnosed Type 2 diabetes between 1977 and 1991<sup>5</sup>. This study identified that more intensive management of blood glucose in people with Type 2 diabetes reduced the future risk of micro- and macro-vascular complications. It also highlighted the important role of managing high blood pressure and cholesterol in this group of people. After 10 years of follow up the average HbA<sub>1c</sub> was 53mmol/mol (7.0 per cent) in the intensive management group compared to 63mmol/mol (7.9 per cent) in the conventional treatment group<sup>5</sup>. A comparable cohort of people in the 2012–2013 NDA cohort had a mean HbA<sub>1c</sub> of 57mmol/mol (7.4 per cent). In this group of people the mean systolic blood pressure was 131.3mmHg, the mean diastolic blood pressure was 77.7mmHg and mean total cholesterol was 4.5mmol/l.

These comparisons highlight the much greater progress that has been made in the management of Type 2 diabetes than Type 1 diabetes over the past 15 years.

The treatment outcomes achieved by people with Type 2 diabetes across England and Wales for HbA<sub>1c</sub>, blood pressure and cholesterol are only slightly higher than those achieved by people in the intensive management group of UKPDS. By contrast the small improvement in mean HbA<sub>1c</sub> among people with Type 1 diabetes leaves the mean level at 72mmol/mol still firmly in the high risk range. We believe that improvements will require new approaches to care especially for Type 1 diabetes.

# Introduction

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 NDA is managed by the Health and Social Care Information Centre (HSCIC) in partnership with Diabetes UK, supported by Public Health England.

This national report from the tenth year of the audit, presents key findings on key care processes and treatment target achievement rates from 2012-2013 in all age groups in England and Wales.

The report sets out to answer the following audit questions:

- Registrations: Is everyone with diabetes diagnosed and recorded on a practice diabetes register?
- Care Processes: What percentage of people registered with diabetes received the nine NICE key processes of diabetes care?
- Treatment Targets: What percentage of people registered with diabetes achieved NICE defined treatment targets for glucose control, blood pressure and blood cholesterol?

The NDA has been developed to support organisations implementing the National Service Framework (NSF) for Diabetes<sup>6</sup> and achieving the care process and treatment target standards specified in National Institute for Health and Clinical Excellence (NICE) Clinical Guidelines (CG15<sup>7</sup>, CG66<sup>8</sup> and CG87<sup>9</sup>) and the NICE Diabetes in Adults Quality Standards<sup>10</sup>.

It provides overall, sequential and comparative information at GP, hospital, Clinical Commissioning Group (CCG; England) or Local Health Board (LHB; Wales) and national levels.

The 2012-2013 NDA report on the complications of diabetes including mortality will be published in early 2015.

# Participation

**Table 1**  
Practice participation rates in England and Wales by audit year

Audit year	Total number of practices	Number of participating practices	National participation rate
2012-2013	8,476	5,980	70.6%
2011-2012	8,549	7,515	87.9%
2010-2011	8,659	7,008	80.9%

The drop in participation in the NDA this year was expected due to the restructuring of the NHS since April 2013. This has left both challenges and opportunities for clinical audit but undoubtedly the organisational transition had disrupted many well established people and systems. The NDA also acknowledges that uncertainties induced by the debate about changes in the governance landscape alongside pressures related to high rates of changes and upgrades to GP clinical systems added to the complexities of primary care data extraction during this national clinical audit year. So the drop has been technical and organisational. It does not reflect unwillingness to participate; only a very small number (1.3 per cent) of practices declined inclusion.

# Registrations

The audit collects information from both primary care (1°) and secondary (2°) care; the vast majority of patients are registered in primary care with only a relatively small percentage (3.8 per cent) of records appearing only in secondary care submissions. [Tables 2, 3 and 4](#) show the volume of records collected in the audit over the last 3 years.

**Table 2**  
Diabetes registrations and prevalence for all diabetes<sup>a</sup> in England and Wales by source and audit year

Audit year	Total number of registrations	Percentage of the population <sup>b</sup>	Registrations from 1° care	Registrations from 2° care not collected from 1° care
2012-2013	2,058,321	4.87%	1,979,929	78,392
2011-2012	2,473,239	4.73%	2,422,938	50,301
2010-2011	2,235,810	4.59%	2,171,528	64,282

<sup>a</sup> All diabetes includes maturity onset diabetes of the young (MODY), other specified diabetes and not specified diabetes.

<sup>b</sup> Diabetes prevalence is calculated using patient registrations from primary care and patient registrations from secondary care, where the patients GP practice participated in the audit.

**Table 3**  
Diabetes registrations and prevalence for Type 1 diabetes in England and Wales by source and audit year

Audit year	Total number of registrations	Percentage of the population <sup>a</sup>	Registrations from 1° care	Registrations from 2° care not collected from 1° care
2012-2013	177,475	0.40%	163,562	13,913
2011-2012	213,960	0.40%	207,566	6,394
2010-2011	202,134	0.41%	193,238	8,896

<sup>a</sup> Diabetes prevalence is calculated using patient registrations from primary care and patient registrations from secondary care, where the patients GP practice participated in the audit.

**Table 4**  
Diabetes registrations and prevalence for Type 2 diabetes in England and Wales by source and audit year

Audit year	Total number of registrations	Percentage of the population <sup>a</sup>	Registrations from 1° care	Registrations from 2° care not collected from 1° care
2012-2013	1,835,634	4.38%	1,792,968	42,666
2011-2012	2,216,129	4.25%	2,190,665	25,464
2010-2011	1,986,611	4.10%	1,954,768	31,843

<sup>a</sup> Diabetes prevalence is calculated using patient registrations from primary care and patient registrations from secondary care, where the patients GP practice participated in the audit.

## Case Ascertainment

The Quality Outcomes Framework (QOF)<sup>11</sup> collects the number of patients with diabetes aged 17 years and above with Type 1 and Type 2 diabetes. Table 5 compares the number of diabetes registrations in the NDA with the number of diabetes registrations in QOF and shows the following case ascertainment.

<b>Table 5</b> <b>Diabetes registrations for Type 1 and Type 2 diabetes for patients aged 17 years and over in England and Wales by audit year</b>				
Country	Audit year	NDA registrations <sup>a</sup>	QOF registrations	Percentage of patients recorded in NDA compared with QOF
England	2012-2013 <sup>b</sup>	1,921,771	2,703,044	71.1%
	2011-2012	2,269,580	2,566,436	88.4%
	2010-2011	2,086,593	2,455,937	85.0%
Wales	2012-2013 <sup>b</sup>	120,149	173,299	69.3%
	2011-2012	137,768	167,537	82.2%
	2010-2011	83,802	160,533	52.2%

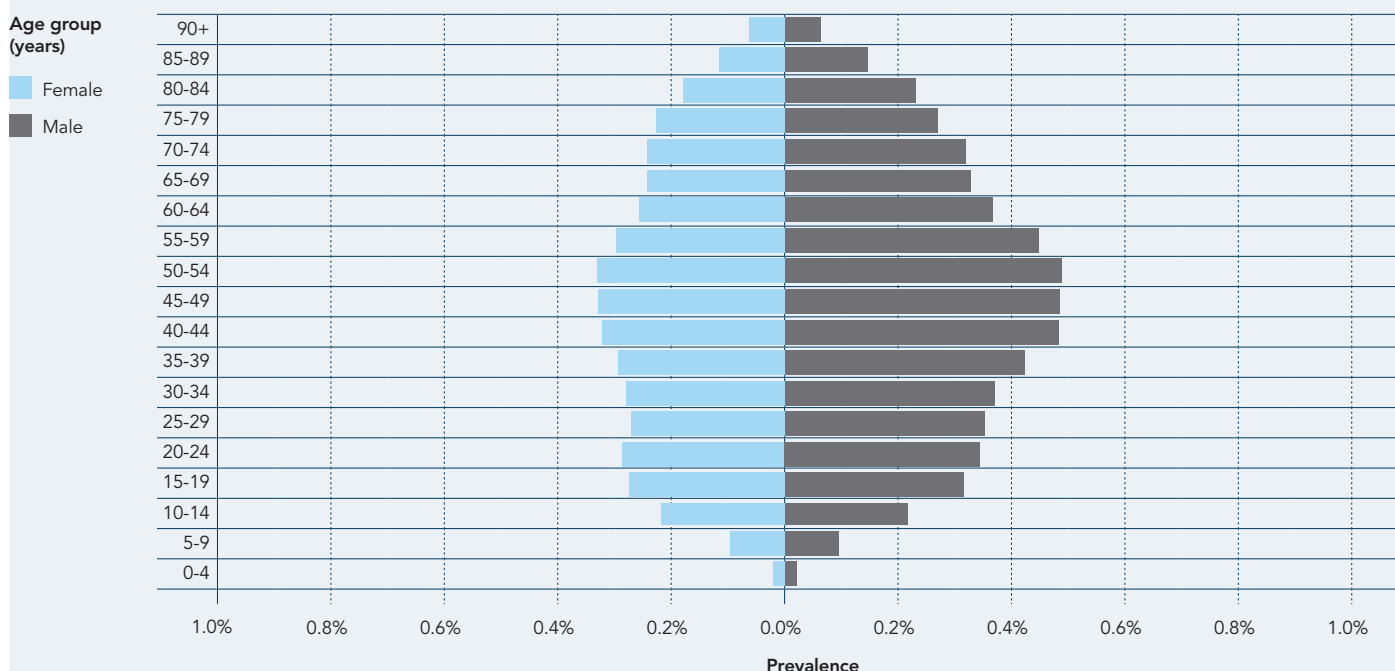
<sup>a</sup> NDA data is collected over a 15 month period, between 1st January and 31st March, whereas QOF data is collected over a 12 month period, between 1st April and the 31st March. Therefore, the figures are not directly comparable.

<sup>b</sup> In 2012-13 QOF methodology was updated to include all diabetes (apart from gestational diabetes), not just type 1 and type 2. NDA methodology for this table has been updated in accordance.

# Demographics

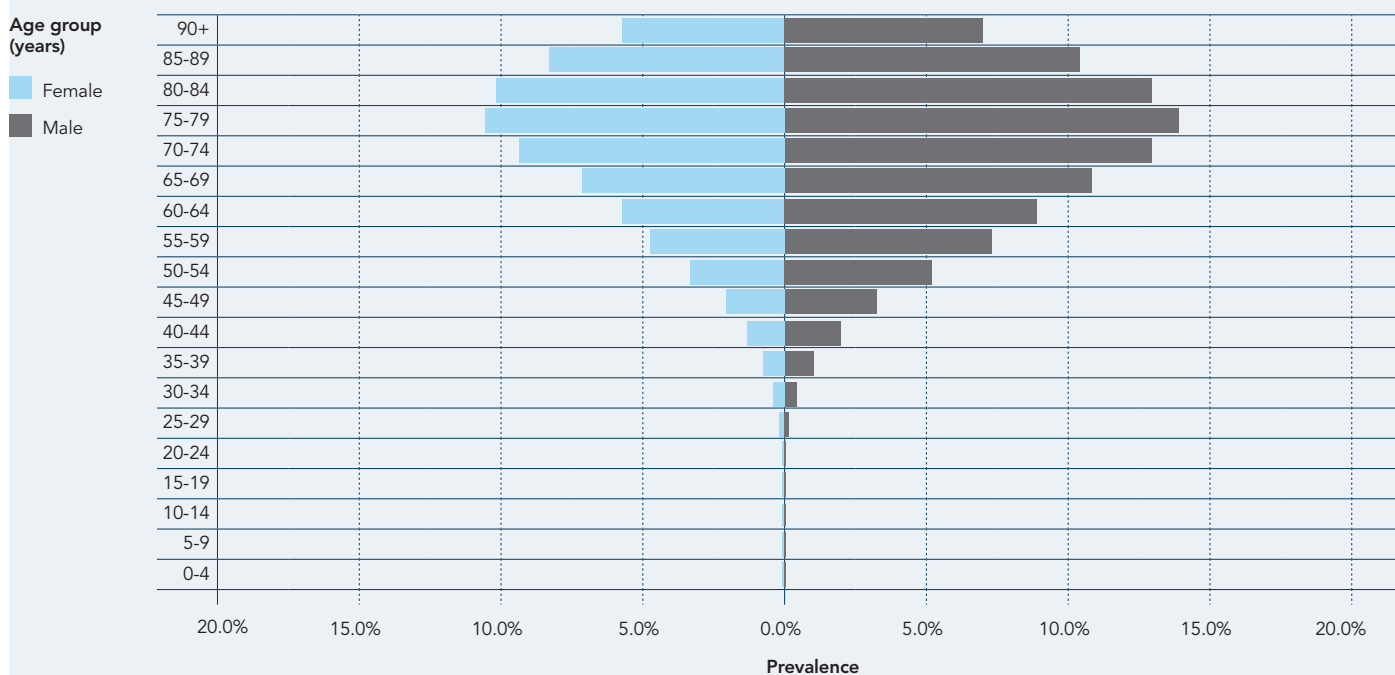
Figures 1 and 2 show the prevalence of Type 1 and Type 2 diabetes for each age group and gender.

**Figure 1**  
Age and gender of patients with Type 1 diabetes in England and Wales<sup>a</sup>



<sup>a</sup> Due to limitations with patient registrations from GP practices data, the age and gender of patients with Type 1 diabetes prevalence was calculated using the Office for National Statistics (ONS) mid-year population estimates for 2012 by age group and gender. As a result, Figure 1 may show an underestimation of Type 1 diabetes prevalence.

**Figure 2**  
Age and gender of patients with Type 2 diabetes in England and Wales<sup>a</sup>



<sup>a</sup> Due to limitations with patient registrations from GP practices data, the age and gender of patients with Type 2 diabetes prevalence was calculated using the ONS mid-year population estimates for 2012 by age group and gender. As a result, Figure 2 may show an underestimation of Type 2 diabetes prevalence.



# Care Processes

All patients aged 12 years and over should receive all of the nine, NICE recommended care processes<sup>12</sup>. These are the annual checks for the effectiveness of diabetes treatment (HbA<sub>1c</sub>), cardiovascular risk factors [blood pressure (BP), serum cholesterol, body mass index (BMI), smoking] and emergence of early complications [eye screening, foot surveillance and urine albumin/serum creatinine (kidney surveillance)].

Table 6 shows the completion rates for eight of the nine, NICE recommended care processes. Eye screening is not included because it is organised by NHS Diabetes Eye Screening.

**Table 6**  
Percentage of patients in England and Wales receiving NICE recommended care processes (excluding eye screening) by care process, diabetes type and audit year

	All diabetes <sup>a</sup>			Type 1			Type 2		
	2010-2011	2011-2012	2012-2013	2010-2011	2011-2012	2012-2013	2010-2011	2011-2012	2012-2013
HbA <sub>1c</sub> <sup>b</sup>	92.5%	90.3%	92.4%	86.0%	83.0%	80.5%	93.5%	91.3%	93.8%
Blood pressure	95.0%	95.0%	95.3%	88.7%	88.4%	88.8%	95.9%	95.8%	96.1%
Cholesterol	91.6%	90.9%	91.1%	78.8%	77.8%	78.0%	93.1%	92.4%	92.5%
Serum creatinine	92.5%	92.5%	92.5%	81.2%	81.1%	81.0%	93.8%	93.8%	93.7%
Urine albumin <sup>c</sup>	75.1%	76.0%	73.6%	58.4%	59.2%	57.1%	77.1%	77.9%	75.4%
Foot surveillance	84.3%	85.3%	85.1%	71.5%	72.8%	72.3%	86.1%	87.0%	86.7%
BMI	89.9%	90.3%	90.7%	83.4%	83.7%	84.1%	90.8%	91.3%	91.5%
Smoking	84.8%	85.1%	86.1%	78.6%	79.0%	79.8%	85.7%	85.9%	86.8%
Eight care processes <sup>d</sup>	60.6%	60.5%	59.9%	43.3%	43.2%	41.3%	62.8%	62.6%	61.9%

<sup>a</sup> All diabetes includes maturity onset diabetes of the young (MODY), other specified diabetes and not specified diabetes.

<sup>b</sup> For patients under 12 years of age, 'all care processes' is defined as HbA<sub>1c</sub> only as other care processes are not recommended in the NICE guidelines for this age group.

<sup>c</sup> There is a 'health warning' regarding the screening test for early kidney disease (Urine Albumin Creatinine Ratio, UACR); please see the NDA Methodology section of this report.

<sup>d</sup> The eye screening care process has been removed from this table; therefore 'eight care processes' comprises the eight care processes that are listed above.

**Table 7**  
Percentage of patients in England and Wales receiving NICE recommended care processes (excluding eye screening) by care process, diabetes type and age group

	Type 1				Type 2			
	Under 40	40 to 64	65 to 79	80 and over	Under 40	40 to 64	65 to 79	80 and over
HbA <sub>1c</sub> <sup>b</sup>	68.9%	88.0%	93.5%	92.4%	85.7%	92.7%	95.6%	93.6%
Blood pressure	81.3%	93.0%	96.9%	95.8%	89.3%	95.0%	97.5%	96.8%
Cholesterol	64.0%	86.1%	92.6%	89.5%	82.5%	91.6%	94.6%	91.7%
Serum creatinine	68.5%	88.1%	94.0%	93.2%	84.8%	92.3%	95.6%	94.6%
Urine albumin <sup>c</sup>	43.7%	63.0%	76.4%	75.0%	59.2%	72.0%	79.6%	77.0%
Foot surveillance	59.3%	79.4%	87.6%	83.8%	73.8%	84.8%	90.1%	85.5%
BMI	77.6%	87.9%	91.9%	85.5%	86.4%	91.4%	93.6%	87.4%
Smoking	75.8%	82.1%	84.8%	79.4%	84.1%	86.8%	88.3%	83.3%
Eight care processes <sup>d</sup>	29.1%	47.7%	59.9%	54.4%	46.3%	59.2%	66.7%	59.8%

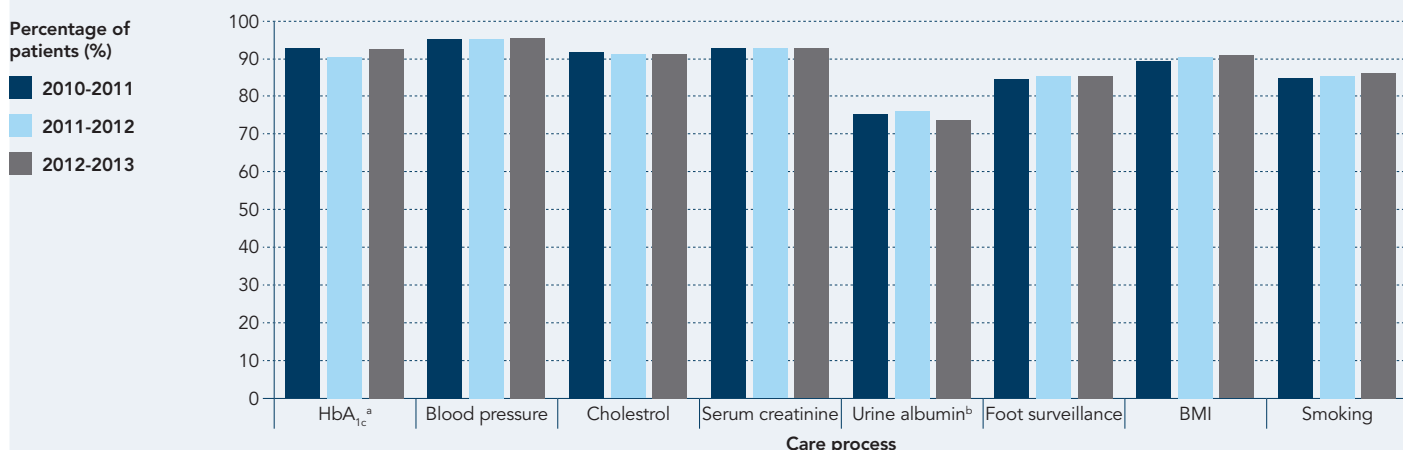
<sup>a</sup> All diabetes includes maturity onset diabetes of the young (MODY), other specified diabetes and not specified diabetes.

<sup>b</sup> For patients under 12 years of age, 'all care processes' is defined as HbA<sub>1c</sub> only as other care processes are not recommended in the NICE guidelines for this age group.

<sup>c</sup> There is a 'health warning' regarding the screening test for early kidney disease (Urine Albumin Creatinine Ratio, UACR); please see the NDA Methodology section of this report.

<sup>d</sup> The eye screening care process has been removed from this table; therefore 'eight care processes' comprises the eight care processes that are listed above.

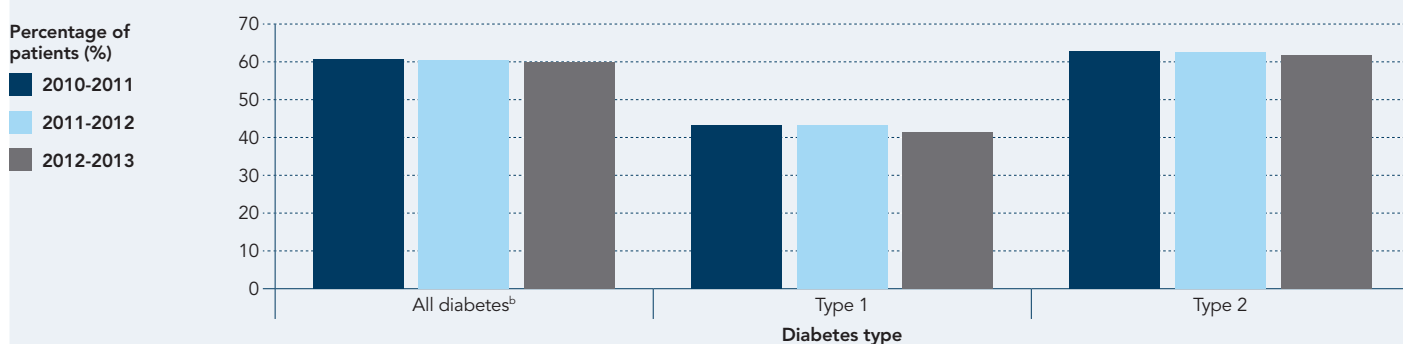
**Figure 3**  
Percentage of all patients in England and Wales receiving NICE care processes (excluding eye screening) by care process and audit year



<sup>a</sup> For patients under 12 years of age, 'all care processes' is defined as HbA<sub>1c</sub> only as other care processes are not recommended in the NICE guidelines for this age group.  
<sup>b</sup> There is a 'health warning' regarding the screening test for early kidney disease (Urine Albumin Creatinine Ratio, UACR); please see the NDA Methodology section of this report.

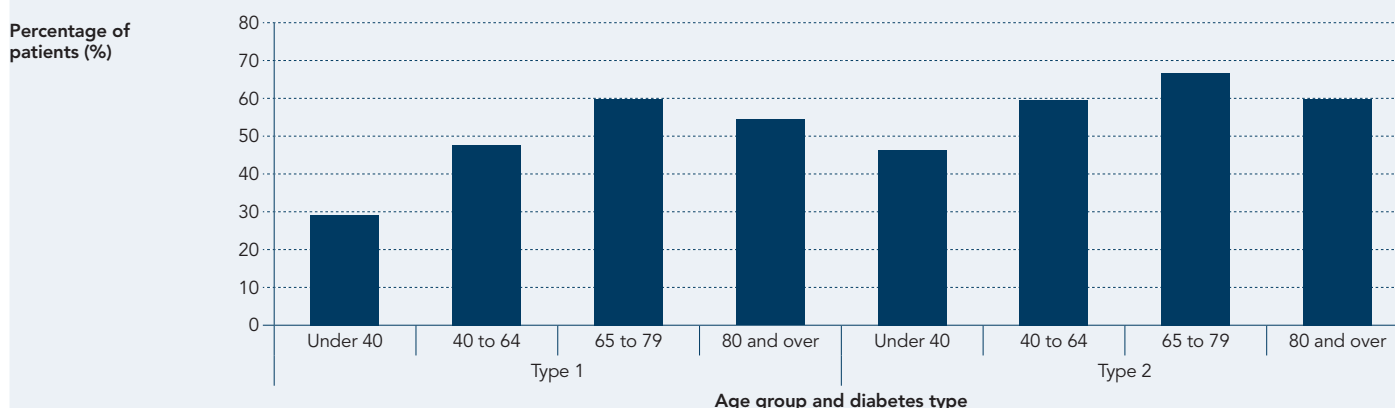
Figure 4 shows the percentage of all patients in England and Wales receiving eight of the nine (excluding eye screening) NICE recommended care processes by audit year and diabetes type.

**Figure 4**  
Percentage of all patients in England and Wales receiving eight of the nine (excluding eye screening) NICE recommended care processes<sup>a</sup> by audit year and diabetes type



<sup>a</sup> The eight NICE recommended care processes are those that are listed in Table 6 (i.e. eye screening is not included in this analysis).  
<sup>b</sup> All diabetes includes maturity onset diabetes of the young (MODY), other specified diabetes and not specified diabetes.

**Figure 5**  
Percentage of all patients in England and Wales receiving eight of the nine (excluding eye screening) NICE recommended care processes<sup>a</sup> by diabetes type and age group

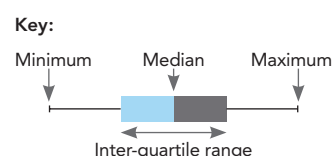


<sup>a</sup> The eight NICE recommended care processes are those that are listed in Table 6 (i.e. eye screening is not included in this analysis).

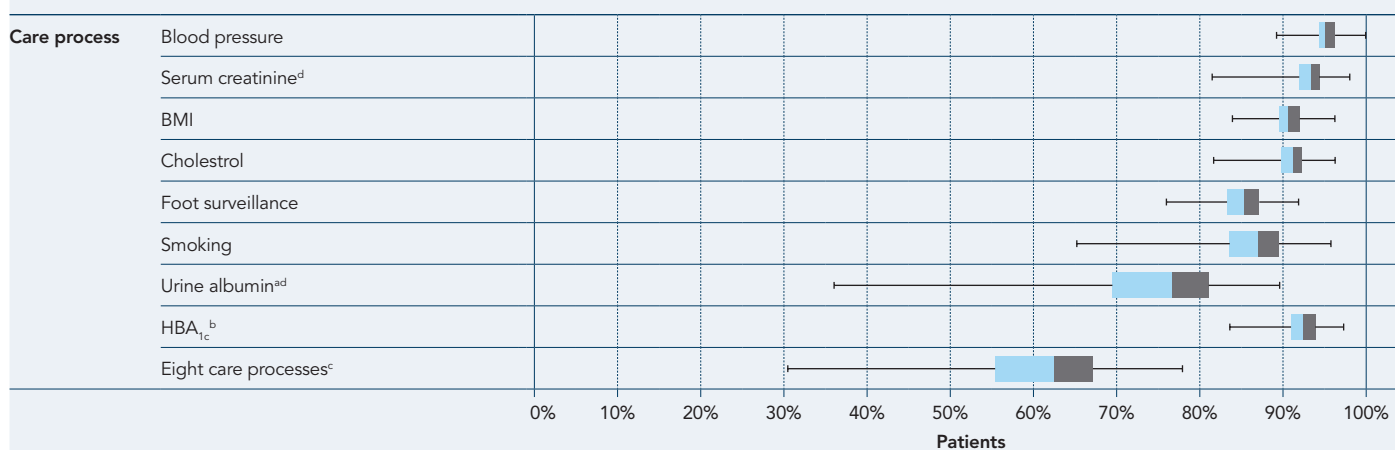
Tables 6 and 7 and Figures 3,4, and 5 highlight:

- Declining care process achievement rates for Type 1 diabetes
- Lower care process achievement rates in younger people with Type 1 and Type 2 diabetes
- No real change in the overall care process performance over the past three years.

When looking at care process completion rates by CCG/LHB, considerable variation is evident. Figure 6 shows the range and distribution of care process achievement by CCGs/LHBs.



**Figure 6**  
The range of CCG/LHB care process completion in England and Wales, 2012-2013



<sup>a</sup> There is a 'health warning' regarding the screening test for early kidney disease (Urine Albumin Creatinine Ratio, UACR); please see the [NDA Methodology](#) section of this report.

<sup>b</sup> For patients under 12 years of age, 'all care processes' is defined as HbA<sub>1c</sub> only as other care processes are not recommended in the NICE guidelines for this age group.

<sup>c</sup> The eye screening care process has been removed from this table; therefore 'eight care processes' comprises the eight care processes that are listed above.

<sup>d</sup> Please note the Creatinine value for Southampton and Mid Essex CCG, and Urine Albumin value for Mid Essex and Harrogate and Rural District CCG have been removed from this chart due to data quality reasons. The impact of this issue does not materially affect the national findings

## Logistic regression analysis of care process completion

The NDA core audit measures recorded clinical practice against NICE clinical guidelines and quality standards and makes recommendations for improvement where necessary. All people with diabetes should have equitable access to care so the audit does not standardise the audit results to adjust for social and demographic factors.

To investigate whether there are demographic and clinical factors that influence the equity of care, logistic regression model analysis has been used. Logistical regression analysis is a statistical method for investigating the potential impact of multiple sometimes interacting factors on an observation. In this case, the possible influence of demographic factors on completion of each care process, plus all 8 care processes has been studied. The models assessed the potential relationships of gender, diabetes type, age, ethnicity, deprivation, body mass index and duration of diabetes with care process completion.

The c-statistic is one method of assessing model fit. C-statistic values over 0.7 indicate a reasonable model fit. Six of the nine models (see [Appendix 2](#)) had c-statistic values that were over 0.7.

Using these factors a reasonable to strong\* model fit was found for seven care processes (HbA<sub>1c</sub>, BP, serum creatinine, cholesterol, smoking, foot surveillance).

Significant associations included:

- Diabetes type – care process completion was lower for patients with Type 1 diabetes compared with those with Type 2 diabetes
- Age group – care process completion was lowest for the youngest age group (0-49 years), when compared to the 60-69 age group. This may be due to a higher proportion of younger patients for those with Type 1 diabetes
- BMI – care process completion was lowest for the <18.5 group. Again, this may be due to more Type 1 patients within this BMI group. Care process completion for those with a BMI of 25 and over was higher for all care processes, compared with those with a BMI of 18.5 to 24.9
- Ethnicity – care process completion is lower in non-white ethnic groups, most notably for smoking. The lowest BMI group (<18.5) also had low completion for recording of smoking status.

Full results of the multivariate analysis can be found in [Appendix 2](#).

\*Models are typically considered to demonstrate reasonable associations when the c-statistic is higher than 0.7 and strong when the c-statistic exceeds 0.8 (Hosmer & Lemeshow, 1989, 2000).

# Treatment Targets

Healthcare professionals and patients should work in partnership to ensure patients achieve their NICE recommended treatment targets for glucose control, blood pressure and serum cholesterol.

Please note there has been a methodology update to the Blood Pressure treatment target. This year the Blood Pressure target has been minimally modified from <140/80 to ≤140/80 to align with the QOF target. This will also affect the All treatments targets result. We were surprised at the resulting size difference

suggesting that Blood Pressure measurement may still be plagued by the long recognised issue of digit preference. We have previously highlighted in the NDA report 2 (2011-2012) how large the contribution of Heart Failure to premature mortality so Blood Pressure control is one of the most valuable components of routine diabetes care and it is therefore essential for it to be measured reliably.

For further information please see the published methodology update report:  
<http://www.hscic.gov.uk/pubs/methchanges>

**Table 8**  
Treatment target achievement rate for all patients in England and Wales by treatment target, diabetes type and audit year

	All diabetes <sup>a</sup>			Type 1			Type 2		
	2010-2011	2011-2012	2012-2013	2010-2011	2011-2012	2012-2013	2010-2011	2011-2012	2012-2013
HbA <sub>1c</sub> <48mmol/mol (6.5%) <sup>b</sup>	24.8%	24.7%	25.1%	6.8%	6.5%	7.5%	26.4%	26.2%	26.4%
HbA <sub>1c</sub> ≤58mmol/mol (7.5%) <sup>b</sup>	63.3%	62.7%	62.2%	28.1%	27.0%	27.3%	66.5%	65.8%	64.8%
HbA <sub>1c</sub> ≤86mmol/mol (10.0%) <sup>b</sup>	92.1%	91.9%	92.4%	82.4%	81.9%	83.0%	93.0%	92.8%	93.1%
BP ≤140/80 <sup>c</sup>	62.0%	67.1%	69.0%	68.8%	72.2%	73.4%	61.4%	66.7%	68.7%
Cholesterol <4mmol/L	40.7%	40.4%	39.6%	30.4%	29.7%	28.7%	41.6%	41.3%	40.5%
Cholesterol <5mmol/L	77.6%	77.0%	76.2%	72.0%	71.1%	70.2%	78.1%	77.5%	76.8%
Meet all treatment targets <sup>d</sup>	33.7%	35.9%	35.9%	16.5%	16.5%	16.2%	35.2%	37.5%	37.4%

<sup>a</sup> All diabetes includes maturity onset diabetes of the young (MODY), other specified diabetes and not specified diabetes.

<sup>b</sup> For patients under 12 years of age, 'all care processes' is defined as HbA<sub>1c</sub> only as other care processes are not recommended in the NICE guidelines for this age group.

<sup>c</sup> BP ≤140/80 does not take into account whether or not patients have eye, kidney or vascular disease.

<sup>d</sup> Where patients have achieved HbA<sub>1c</sub> ≤58mmol/mol, cholesterol <5mmol/L and the blood pressure target.

**Table 9**  
Treatment target achievement rate for all patients in England and Wales by treatment target, diabetes type and age group

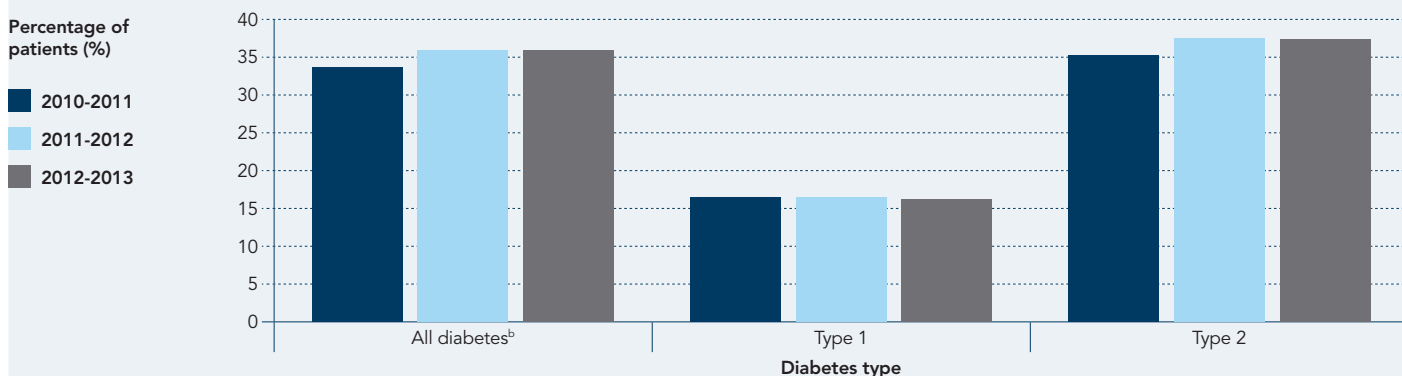
	Type 1				Type 2			
	Under 40	40 to 64	65 to 79	80 and over	Under 40	40 to 64	65 to 79	80 and over
HbA <sub>1c</sub> <48mmol/mol (6.5%) <sup>a</sup>	7.7%	6.7%	8.6%	12.6%	24.4%	22.9%	27.6%	33.5%
HbA <sub>1c</sub> ≤58mmol/mol (7.5%) <sup>a</sup>	24.8%	26.0%	35.5%	40.5%	51.9%	57.7%	69.6%	74.8%
HbA <sub>1c</sub> ≤86mmol/mol (10.0%) <sup>a</sup>	77.5%	84.4%	91.4%	90.5%	84.0%	89.9%	95.8%	96.8%
BP ≤140/80 <sup>b</sup>	78.1%	70.3%	71.7%	70.7%	65.0%	64.9%	71.7%	72.2%
Cholesterol <4mmol/L	22.3%	28.4%	41.6%	43.7%	23.7%	35.7%	44.9%	45.2%
Cholesterol <5mmol/L	64.1%	70.4%	81.5%	81.5%	60.2%	72.5%	81.2%	79.9%
Meet all treatment targets <sup>c</sup>	14.7%	14.7%	22.4%	25.5%	24.3%	30.3%	42.6%	45.1%

<sup>a</sup> For patients under 12 years of age, 'all care processes' is defined as HbA<sub>1c</sub> only as other care processes are not recommended in the NICE guidelines for this age group.

<sup>b</sup> BP ≤140/80 does not take into account whether or not patients have eye, kidney or vascular disease.

<sup>c</sup> Where patients have achieved HbA<sub>1c</sub> ≤58mmol/mol, cholesterol <5mmol/L and their relevant blood pressure target.

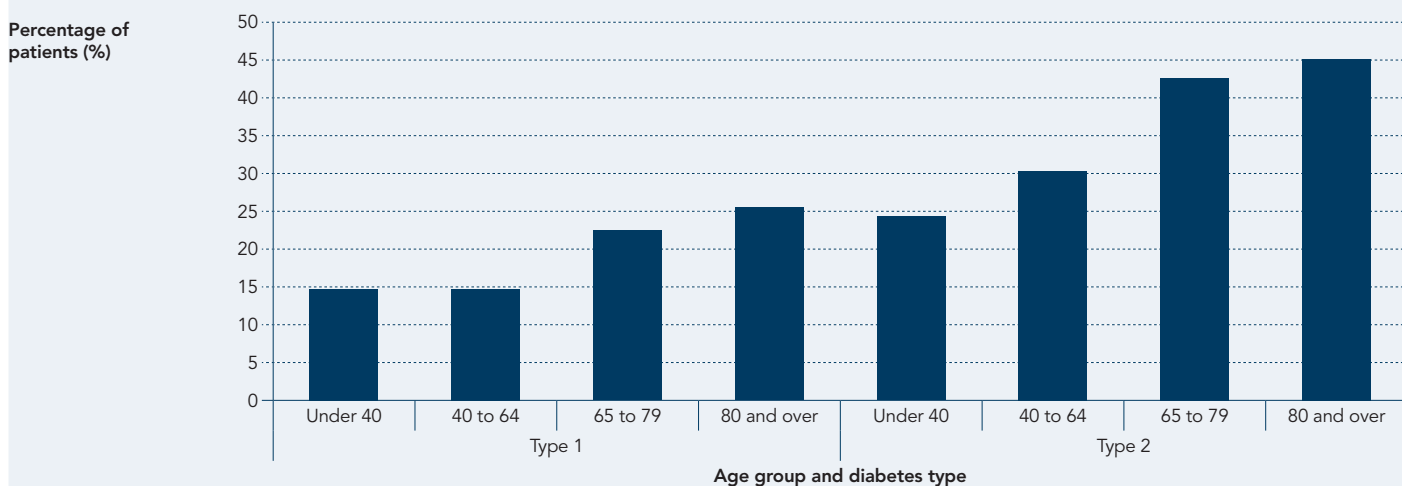
**Figure 7**  
Percentage of all patients in England and Wales achieving treatment targets<sup>a</sup> by audit year and diabetes type



<sup>a</sup> Where patients have achieved HbA<sub>1c</sub> ≤58mmol/mol, cholesterol <5mmol/L and the blood pressure target.

<sup>b</sup> All diabetes includes maturity onset diabetes of the young (MODY), other specified diabetes and not specified diabetes.

**Figure 8**  
Percentage of all patients in England and Wales achieving treatment targets<sup>a</sup> by diabetes type and age group



<sup>a</sup> Where patients have achieved HbA<sub>1c</sub> ≤58mmol/mol, cholesterol <5mmol/L and the blood pressure target.

Tables 8 and 9 and Figures 7 and 8 highlight;

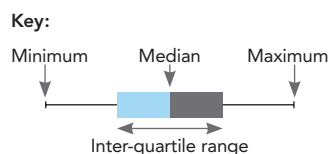
Lower levels of treatment target achievement, particularly for HbA<sub>1c</sub> in people with Type 1 as compared to Type 2 diabetes (Table 8 and Table 9).

Age related treatment target achievement in both Type 1 and Type 2 diabetes (worst in youngest best in oldest; Table 9 and Figure 8).

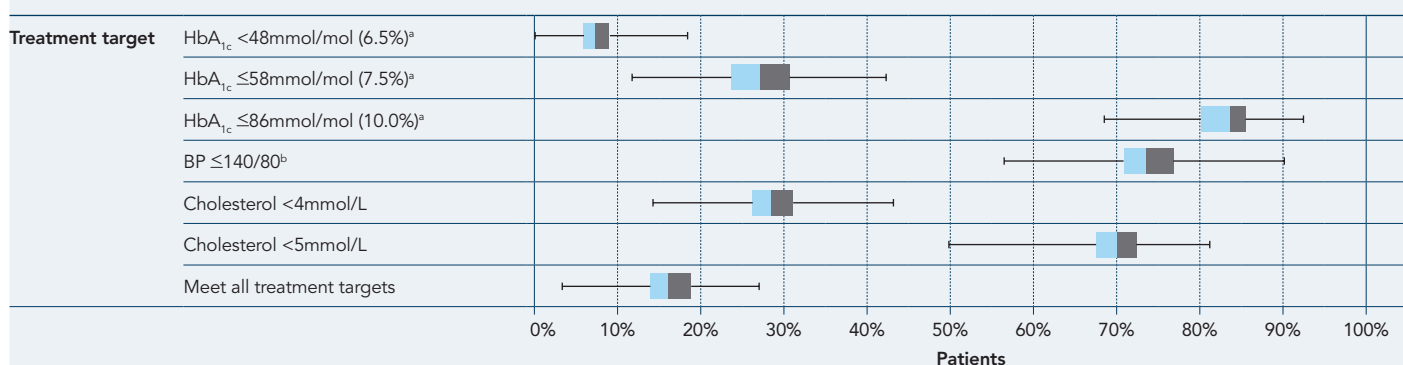
Substantial numbers with exceptionally high risk glucose levels (17.0 per cent of Type 1 and 6.9 per cent of Type 2 patients have HbA<sub>1c</sub> equal to or above 86mmol/mol (10 per cent) (Table 8).

Small improvements in Type 2 but not in Type 1 diabetes over the last three years (Figure 7).

When looking at treatment target achievement rates by CCG/LHB considerable variation is evident. Figures 9 and 10 shows the range and distribution of treatment target achievement by CCG/LHB by Type 1 and Type 2.



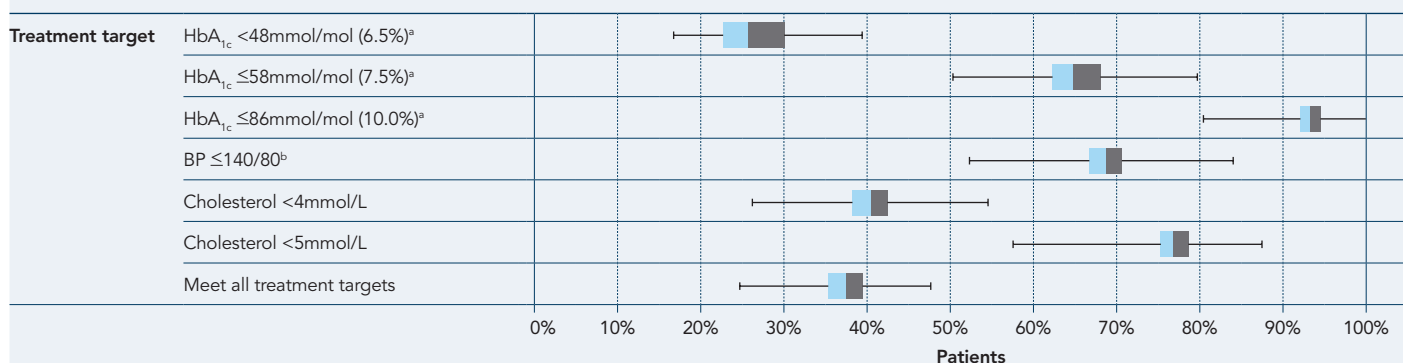
**Figure 9**  
The range of CCG/LHB treatment target achievement for patients with Type 1 diabetes in England and Wales



<sup>a</sup> For patients under 12 years of age, 'all treatment targets' is defined as HbA<sub>1c</sub> only as other treatment targets are not recommended in the NICE guidelines for this age group. For patients over 12, patients have achieved HbA<sub>1c</sub> ≤58mmol/mol, cholesterol <5mmol/L and the blood pressure target.

<sup>b</sup> BP ≤140/80 does not take into account whether or not patients have eye, kidney or vascular disease.

**Figure 10**  
The range of CCG/LHB treatment target achievement for patients with Type 2 diabetes in England and Wales



<sup>a</sup> For patients under 12 years of age, 'all treatment targets' is defined as HbA<sub>1c</sub> only as other treatment targets are not recommended in the NICE guidelines for this age group. For patients over 12, patients have achieved HbA<sub>1c</sub> ≤58mmol/mol, cholesterol <5mmol/L and the blood pressure target.

<sup>b</sup> BP ≤140/80 does not take into account whether or not patients have eye, kidney or vascular disease.

# Structured Education

The NDA has collected data on structured education in England and Wales since 2005. NICE guidance recommend that people with diabetes (Type 1 or Type 2) be offered patient education programmes, officially known as 'structured education'.

The NDA reports whether there is a record that a person with diabetes has been offered or has attended structured education. When looking at data for all people diagnosed with diabetes, structured education was recorded as being offered to 2.4 per cent of those with Type 1 diabetes and 6.0 per cent of those with Type 2 diabetes, whilst 1.1 per cent of those with Type 1 diabetes and 1.6 per cent of those with Type 2 diabetes were recorded as attending structured education.

The analysis in [Table 10](#) considers structured education records in 2012-2013 for patients diagnosed in the same period.

In 2013 the CCG outcome indicator set reported indicator C2.5 'People with diabetes diagnosed less than one year, referred to structured education.' This indicator uses a similar construction to the information presented below but uses diagnosis date (rather than year), which is currently unavailable for analysis, to define patients diagnosed less than a year.

**Table 10**  
Structured education for newly diagnosed people with diabetes

		Number diagnosed	Offered	Attended	Offered or attended <sup>a</sup>
All diabetes <sup>b</sup>	n	196,675	31,336	6,740	36,270
	%	N/A	15.9%	3.4%	18.4%
Type 1	n	6,847	264	60	320
	%	N/A	3.9%	0.9%	4.7%
Type 2	n	182,045	30,409	6,569	35,201
	%	N/A	16.7%	3.6%	19.3%
Other <sup>c</sup>	n	7,783	663	111	749
	%	N/A	8.5%	1.4%	9.6%

<sup>a</sup> Due to issues with data quality, a patient may be recorded as attending structured education without it recorded as being offered to them; the offered or attended column, which is included in this table, gives an indication of the scale of this issue.

<sup>b</sup> All diabetes includes maturity onset diabetes of the young (MODY), other specified diabetes and not specified diabetes.

<sup>c</sup> Other diabetes comprises maturity onset diabetes of the young (MODY), other specified diabetes and not specified diabetes.

**Table 11**  
Structured education for all people with diabetes

		Number diagnosed	Offered	Attended	Offered or attended <sup>a</sup>
All diabetes <sup>b</sup>	n	1,979,929	113,166	31,266	134,473
	%	N/A	5.7%	1.6%	6.8%
Type 1	n	163,562	3,953	1,879	5,579
	%	N/A	2.4%	1.1%	3.4%
Type 2	n	1,792,968	108,173	29,161	127,681
	%	N/A	6.0%	1.6%	7.1%
Other <sup>c</sup>	n	22,954	1,029	220	1,197
	%	N/A	4.5%	1.0%	5.2%

<sup>a</sup> Due to issues with data quality, a patient may be recorded as attending structured education without it recorded as being offered to them; the offered or attended column, which is included in this table, gives an indication of the scale of this issue.

<sup>b</sup> All diabetes includes maturity onset diabetes of the young (MODY), other specified diabetes and not specified diabetes.

<sup>c</sup> Other diabetes comprises maturity onset diabetes of the young (MODY), other specified diabetes and not specified diabetes.



# Data Completeness

Table 12 shows the completeness, following cleaning of key fields, used in the analysis of this report.

Table 12 Comparison of NDA data completeness by audit year				
		Audit year		
		2010-2011	2011-2012	2012-2013
Denominator		2,171,528	2,422,938	1,979,929
Gender	%	>99.9%	>99.9%	>99.9%
Diabetes type (specified)	%	99.5%	99.5%	99.2%
Age	%	>99.9%	>99.9%	>99.9%
Ethnicity (known and stated)	%	74.6%	75.4%	76.9%
Year of diagnosis	%	98.0%	98.0%	97.9%

# NDA Methodology

Participation in the NDA is voluntary; however it does cover 71.1 per cent of the people diagnosed with diabetes in England and 69.3 per cent in Wales (when compared with QOF). The NDA collects information on all patients who have been diagnosed with diabetes before the audit end date (31st March 2013).

Clinical Commissioning Groups (CCGs), Local Health Boards (LHBs), GP practices and adult outpatient secondary care units submit data about the care that is being delivered for people with diabetes in their organisation. This will include children that have been treated in an adult care setting. For the full picture on the paediatric care for children with diabetes please refer to the National Paediatric Diabetes Audit which is conducted by the Royal College of Paediatrics and Child Health (RCPCH)<sup>13</sup>.

In addition to the data submitted by participating organisations, supplementary information relating to specific complications and procedures is sourced from the Hospital Episodes Statistics (HES) database and the Patient Episode Database for Wales (PEDW). The NDA data is linked to HES or PEDW data to the correct patient record to provide a fuller analysis.

The Quality and Outcomes Framework (QOF) is an aggregated return which provides information from GP Practices. This information is used within the report when discussing coverage. However, the NDA provides a more detailed picture of the clinical processes and care pathway for those diagnosed with diabetes.

Please note that for time series analysis, results are compared with previous years data analysed using NDA methodology. Time series data should not be compared to other reports where different methodology may have been used.

There have been changes to Blood pressure targets to be less than or equal to instead of just less than. These changes are documented in a published paper which can be located <http://www.hscic.gov.uk/pubs/methchanges>

## Data Quality

There is a 'health warning' regarding the screening test for early kidney disease (Urine Albumin Creatinine Ratio, UACR). An issue with data supplied to the HSCIC for the 2012–2013 Audit was brought to our attention prior to publication, which is believed to be restricted to Urine Albumin data extraction across a number of practices. Caution should be borne in mind when looking at the variation across CCG's for this care process. The audit team are investigating this further and once more information is known a note will be published with conclusions and any actions which may need to be made.

## Further Information

All health economies (CCGs and LHBs) are receiving a published locality report. Additional supporting online data is available alongside this publication with each/All Care Process and Treatment Target by all patients, and newly diagnosed patients, as well as structured education all by CCG.

Participating specialist services are also receiving reports about the patients who attended their clinics, Where the specialist services were only able to submit the NHS Numbers for their patients information on those patients is taken from the primary collected data.

General Practice reports will be made available to participating practices via a secure online portal these are not publically available.

# References

1. Action for Diabetes NHS England Domain 2 - long Term Conditions, Medical Directorate Published January 2014  
<http://www.england.nhs.uk/wp-content/uploads/2014/01/act-for-diabetes.pdf>
2. General Lifestyle Survey 2011: Chapter 1 - Smoking, Office for National Statistics  
<http://www.ons.gov.uk/ons/rel/ghs/general-lifestyle-survey/2011/rpt-chapter-1.html#tab-The-prevalence-of-cigarette-smoking>
3. The Diabetes Control and Complications Trial/ Epidemiology of Diabetes Interventions and Complications Research Group Retinopathy and nephropathy in patients with Type 1 diabetes four years after a trial of intensive therapy New England Journal of Medicine 2000;342:381-389  
<http://www.nejm.org/doi/full/10.1056/NEJM200002103420603>
4. The Diabetes Control and Complications Trial The effect of intensive treatment of diabetes on the development and progression of long term complications of insulin-dependent diabetes mellitus New England Journal of Medicine 1993;329:977-86  
<http://www.nejm.org/doi/full/10.1056/NEJM199309303291401>
5. UK Prospective Diabetes Study Group UK Prospective Diabetes Study (UKPDS) Study design, progress and performance Diabetologia 1991;34:877-90
6. National Service Framework (NSF) for Diabetes  
<https://www.gov.uk/government/publications/national-service-framework-diabetes>
7. NICE Clinical Guidelines – CG15: Type 1 diabetes: Diagnosis and management of Type 1 diabetes in children, young people and adults  
<http://www.nice.org.uk/CG15>
8. NICE Clinical Guidelines – CG66: Type 2 Diabetes (partially updated by CG87)  
<http://www.nice.org.uk/CG66>
9. NICE Clinical Guidelines – CG87: Type 2 Diabetes – newer agents (partial update of CG66)  
<http://www.nice.org.uk/CG15>
10. NICE – Diabetes in Adults Quality Standard  
<http://guidance.nice.org.uk/QS6>
11. Quality Outcomes Framework (QOF)  
<http://www.hscic.gov.uk/qof>
12. NICE recommended care processes  
<https://www.nice.org.uk/guidance>
13. National Paediatric Diabetes Audit, Royal College of Paediatrics and Child Health  
<http://www.rcpch.ac.uk/npdat>

# Appendix 1: Characteristics of people with diabetes

**Table 13**  
Characteristics of people with diabetes, 2012-2013 registrations from primary care diagnosed any time

		All diabetes <sup>a</sup>			Type 1			Type 2		
		Total	Receiving eight care processes <sup>bc</sup>	Meeting all treatment targets <sup>d</sup>	Total	Receiving eight care processes <sup>bc</sup>	Meeting all treatment targets <sup>d</sup>	Total	Receiving eight care processes <sup>bc</sup>	Meeting all treatment targets <sup>d</sup>
All		1,979,929	59.9%	35.9%	163,562	41.3%	16.2%	1,792,968	61.9%	37.4%
Sex	Male	1,104,731	61.5%	37.3%	92,797	42.1%	17.4%	999,437	63.7%	38.8%
	Female	875,197	57.8%	34.2%	70,765	40.2%	14.6%	793,530	59.7%	35.6%
Age (years)	0 to 9	4,131	27.7%	24.4%	3,897	28.6%	24.1%	53	17.0%	44.4%
	10 to 19	18,622	14.0%	13.9%	17,174	13.9%	12.7%	907	19.5%	25.3%
	20 to 29	33,420	33.2%	17.6%	24,024	31.7%	14.3%	8,488	39.6%	25.0%
	30 to 39	74,387	43.8%	21.3%	25,142	37.2%	14.9%	47,464	48.1%	24.2%
	40 to 49	211,349	51.6%	23.2%	33,012	42.7%	13.7%	175,003	53.7%	24.8%
	50 to 59	382,146	58.2%	28.1%	27,252	50.6%	14.3%	350,299	59.1%	29.2%
	60 to 69	518,716	64.5%	37.4%	18,413	57.4%	19.7%	495,160	65.0%	38.1%
	70 to 79	473,632	66.6%	43.6%	10,569	60.8%	23.6%	458,867	67.0%	44.1%
	80 to 89	234,627	61.1%	45.1%	3,783	55.7%	25.2%	228,571	61.5%	45.4%
	90+	28,898	45.1%	42.4%	296	37.5%	29.3%	28,155	45.7%	42.5%
Ethnic group	White	1,199,452	61.5%	36.7%	107,843	43.0%	16.2%	1,079,090	63.7%	38.3%
	Mixed	14,989	56.5%	31.8%	1,298	38.0%	19.0%	13,447	58.8%	32.8%
	Asian	183,369	58.2%	34.0%	5,760	44.2%	17.1%	174,975	59.0%	34.4%
	Black	74,686	57.7%	32.3%	4,544	40.3%	17.3%	69,083	59.2%	33.1%
	Other	49,330	55.7%	37.1%	3,512	39.2%	17.5%	45,073	57.4%	38.3%
	Not stated/Not known	458,103	57.1%	35.3%	40,605	36.7%	15.5%	411,300	59.6%	36.8%
Deprivation	Most deprived fifth	451,797	60.2%	35.3%	31,597	41.7%	14.4%	414,501	62.0%	36.6%
	2nd most deprived fifth	401,275	59.0%	35.5%	31,496	41.2%	15.2%	364,639	60.9%	36.9%
	3rd most deprived fifth	369,843	59.5%	36.1%	31,109	41.9%	16.7%	334,303	61.5%	37.6%
	2nd least deprived fifth	341,389	59.8%	36.6%	30,548	41.6%	16.9%	307,043	62.0%	38.2%
	Least deprived fifth	292,905	59.2%	37.0%	29,090	40.9%	18.4%	260,845	61.5%	38.6%
BMI	<18.5 (Underweight)	12,447	48.0%	37.6%	4,434	37.5%	18.4%	7,740	54.8%	44.4%
	18.5 to 24.9 (Normal weight)	272,607	62.7%	41.2%	46,638	45.6%	17.4%	223,072	66.6%	45.3%
	25.0 to 29.9 (Pre-obesity)	594,106	67.3%	39.3%	47,643	51.6%	16.0%	541,168	68.9%	41.1%
	30.0 to 34.9 (Obesity class I)	496,254	67.6%	34.8%	22,975	54.4%	15.0%	468,967	68.5%	35.7%
	35.0 to 39.9 (Obesity class II)	244,496	66.3%	31.2%	7,974	54.5%	15.2%	234,325	66.9%	31.8%
	40.0+ (Obesity class III)	154,262	63.3%	28.6%	3,753	52.8%	15.3%	149,098	63.7%	28.9%
Smoking status	Never smoked	789,426	70.0%	35.5%	62,659	51.9%	17.8%	718,467	71.9%	36.9%
	Ex smoker	616,978	72.4%	38.9%	30,092	58.1%	17.1%	581,492	73.3%	40.0%
	Current smoker	267,332	62.5%	31.6%	28,187	45.8%	10.5%	235,944	64.8%	33.8%
Duration of diabetes (years)	<1	196,675	52.3%	31.5%	6,847	27.8%	22.6%	182,045	54.1%	31.9%
	1 to 4	551,419	62.0%	39.8%	20,736	34.7%	20.4%	523,697	63.4%	40.3%
	5 to 9	563,640	61.5%	39.0%	26,138	35.7%	16.2%	534,065	63.0%	39.8%
	10 to 14	338,059	60.7%	34.7%	26,216	40.0%	14.3%	309,595	62.7%	36.0%
	15 to 19	142,269	59.2%	29.9%	20,471	43.2%	14.2%	120,882	62.2%	32.2%
	20 to 29	100,388	56.4%	26.0%	27,646	44.9%	15.0%	72,151	61.0%	29.7%
	30 to 39	29,094	51.6%	20.7%	17,386	47.2%	15.6%	11,549	58.6%	27.7%
	40 to 49	11,432	53.9%	20.4%	8,468	52.0%	17.9%	2,903	60.1%	27.5%
	50+	5,690	57.7%	25.0%	3,521	55.2%	20.4%	2,136	62.3%	32.4%

<sup>a</sup> All diabetes includes maturity onset diabetes of the young (MODY), other specified diabetes and not specified diabetes.

<sup>b</sup> The eight care processes are those that are listed in Table 6 (i.e. eye screening is not included in this analysis).

<sup>c</sup> For patients under 12 years of age, 'all care processes' is defined as HbA<sub>1c</sub> only as other care processes are not recommended in the NICE guidelines for this age group.

<sup>d</sup> Where patients have achieved HbA<sub>1c</sub> ≤58mmol/mol, cholesterol <5mmol/L and the blood pressure target.

**Table 14**  
**Characteristics of people with diabetes, 2012-2013 registrations from primary care newly diagnosed**

		All diabetes <sup>a</sup>			Type 1			Type 2		
		Total	Receiving eight care processes <sup>bc</sup>	Meeting all treatment targets <sup>d</sup>	Total	Receiving eight care processes <sup>bc</sup>	Meeting all treatment targets <sup>d</sup>	Total	Receiving eight care processes <sup>bc</sup>	Meeting all treatment targets <sup>d</sup>
All		196,675	52.3%	31.5%	6,847	27.8%	22.6%	182,045	54.1%	31.9%
Sex	Male	111,755	53.1%	33.0%	4,074	28.1%	24.2%	103,347	54.8%	33.3%
	Female	84,920	51.4%	29.6%	2,773	27.4%	20.1%	78,698	53.0%	29.9%
Age (years)	0 to 9	1,192	21.7%	28.6%	1,104	22.5%	28.2%	15	20.0%	100.0%
	10 to 19	2,265	13.4%	27.3%	1,868	13.0%	28.2%	245	21.6%	23.5%
	20 to 29	3,846	34.0%	23.6%	1,368	28.9%	22.3%	2,205	39.6%	24.2%
	30 to 39	12,145	46.4%	22.3%	950	35.4%	22.8%	10,552	48.4%	22.2%
	40 to 49	31,571	50.0%	21.8%	710	40.0%	16.2%	29,602	51.0%	22.0%
	50 to 59	46,233	53.1%	25.3%	428	46.7%	19.1%	44,009	53.8%	25.4%
	60 to 69	49,790	56.5%	35.1%	245	46.9%	21.4%	47,778	57.2%	35.3%
	70 to 79	34,075	56.6%	41.8%	126	54.0%	28.7%	32,735	57.2%	42.0%
	80 to 89	13,976	50.8%	43.5%	41	31.7%	22.6%	13,410	51.7%	43.8%
	90+	1,582	36.3%	37.8%	7	42.9%	100.0%	1,494	37.1%	37.6%
Ethnic group	White	113,275	53.8%	32.6%	4,170	29.6%	22.6%	105,039	55.5%	33.0%
	Mixed	1,658	51.0%	24.5%	101	27.7%	25.0%	1,471	53.6%	24.9%
	Asian	19,785	52.6%	29.4%	310	30.6%	19.6%	18,552	54.0%	29.5%
	Black	8,140	52.7%	26.9%	276	33.0%	21.8%	7,507	54.3%	27.3%
	Other	5,280	48.8%	31.4%	154	27.9%	25.0%	4,864	50.5%	31.6%
	Not stated/Not known	48,537	49.1%	30.9%	1,836	22.5%	23.0%	44,612	51.1%	31.2%
Deprivation	Most deprived fifth	47,614	53.8%	30.2%	1,642	30.3%	19.1%	44,038	55.6%	30.6%
	2nd most deprived fifth	40,707	52.0%	30.8%	1,452	28.8%	21.2%	37,604	53.7%	31.1%
	3rd most deprived fifth	36,332	51.5%	31.7%	1,210	28.9%	23.1%	33,687	53.1%	32.1%
	2nd least deprived fifth	33,404	50.9%	33.2%	1,171	25.1%	27.0%	30,958	52.6%	33.4%
	Least deprived fifth	27,645	50.8%	32.7%	1,037	25.7%	26.0%	25,570	52.6%	33.0%
BMI	<18.5 (Underweight)	1,385	42.2%	33.4%	644	33.4%	26.1%	658	53.3%	37.0%
	18.5 to 24.9 (Normal weight)	21,334	57.0%	37.7%	1,990	35.5%	24.9%	18,470	60.2%	38.8%
	25.0 to 29.9 (Pre-obesity)	54,874	59.7%	35.5%	1,150	43.4%	22.0%	51,727	60.7%	35.8%
	30.0 to 34.9 (Obesity class I)	51,416	58.3%	31.6%	497	40.8%	17.8%	49,165	59.1%	31.8%
	35.0 to 39.9 (Obesity class II)	27,731	56.6%	27.2%	176	54.0%	22.5%	26,616	57.2%	27.3%
	40.0+ (Obesity class III)	19,734	53.5%	24.7%	96	40.6%	16.7%	19,006	54.2%	24.8%
Smoking status	Never smoked	82,803	58.2%	31.0%	2,260	35.8%	25.8%	77,356	59.5%	31.2%
	Ex smoker	61,209	59.3%	34.8%	702	43.2%	20.7%	58,506	60.1%	35.1%
	Current smoker	32,389	52.6%	27.6%	1,171	34.7%	14.8%	29,945	54.0%	28.2%

<sup>a</sup> All diabetes includes maturity onset diabetes of the young (MODY), other specified diabetes and not specified diabetes.

<sup>b</sup> The eight care processes are those that are listed in [Table 6](#) (i.e. eye screening is not included in this analysis).

<sup>c</sup> For patients under 12 years of age, 'all care processes' is defined as HbA<sub>1c</sub> only as other care processes are not recommended in the NICE guidelines for this age group.

<sup>d</sup> Where patients have achieved HbA<sub>1c</sub> ≤58mmol/mol, cholesterol <5mmol/L and the blood pressure target.

## Appendix 2: Regressions Analysis

Logistic regression modelling has been used as the multivariate statistical technique throughout this report.

The results of the logistic regression analyses are presented in [Table 15](#).

A logistic regression model was used to explore which person and environmental variables were associated with having a care process recorded as complete. The model allows each variable to be considered independently by controlling for the effects of other, sometimes related factors. The model allows an evaluation of the strength of the relationship between each of the variables and the probability of care process completion.

When modelling data in this way the aim is to produce a model which both satisfies certain statistical criteria and maintains a connection with the real-world understanding of the behaviours we are trying to explain. The ability of the model to explain the variation seen in our data has been presented as the 'c-statistic'. This statistic is the probability that predicting the outcome is better than chance. The values for this measure range from 0.5 to 1.0. A value of 0.5 indicates that the model is no better than chance at making about whether a person will get their care process and a value of 1.0 indicates that the model perfectly identifies those who will have the process and those not. Models are typically considered reasonable when the c-statistic is higher than 0.7 and strong when the c-statistic exceeds 0.8\*.

The choice of explanatory variables came from consultation with our clinical lead. All variables were found to make significant improvements to the ability of the model to explain observed variation.

The variables included in the models to explain care process completion were: gender, diabetes type, age group, ethnicity, deprivation group, body mass index (BMI), and duration of diabetes.

Following initial analysis of the data all our explanatory variables were grouped into categorical variables, which group cases into a number of discrete categories (for example deprivation is grouped into five categories or quintiles). Missing values for explanatory variables were included in the models. Excluding missing values for explanatory variables can cause significant sample attrition, since cases are lost if they have a missing value for any one of the relevant variables. Had these values been excluded we would have reduced the precision of estimates and may have introduced bias.

The model identifies associations, not causes; in other words, factors which identify individuals with an increased or decreased probability of having a care process in the audit period. These variations in risk are expressed as odds ratios and expressed relative to a reference category, with is given a value of 1. Odds ratios greater than 1 indicate increased probability of the care process being completed in the group and odds ratios less than 1 indicate decreased probability of the care process being completed. Also provided are the 95% confidence intervals for the odds ratio. Where the interval does not include 1, the category is significantly different ( $P < 0.05$ ) from the reference category.

\*Hosmer & Lemeshow, 1989, 2000

**Table 15**  
Results from multivariate analysis of 2012-2013 data for care process completion

	All diabetes*								
	HbA <sub>1c</sub>	Blood pressure	Cholesterol	Serum creatinine	Urine albumin	Foot surveillance	Body Mass Index	Smoking	Eight care processes excluding eye screening
Number of observations used in model	1,979,929	1,973,530	1,973,530	1,973,530	1,973,530	1,973,530	1,973,530	1,973,530	1,979,929
Filters	None	Age≤12	Age≤12	Age≤12	Age≤12	Age≤12	Age≤12	Age≤12	None
Intercept	3.37 (3.34, 3.40)	4.49 (4.44, 4.53)	3.10 (3.07, 3.12)	3.22 (3.19, 3.25)	1.56 (1.54, 1.57)	2.54 (2.52, 2.56)	2.80 (2.78, 2.81)	2.78 (2.76, 2.80)	1.01 (1.00, 1.02)
c statistic <sup>1</sup> (model fit)	0.84	0.92	0.80	0.81	0.69	0.80	0.62	0.73	0.69
Gender: Female vs. Male	1.01 (1.00, 1.03)	1.14 (1.12, 1.16)	0.93 (0.92, 0.94)	1.03 (1.02, 1.05)	0.85 (0.85, 0.86)	0.97 (0.97, 0.98)	0.92 (0.91, 0.93)	0.87 (0.86, 0.88)	0.85 (0.85, 0.86)
Diabetes Type 1 vs. Type 2	0.51 (0.49, 0.52)	0.72 (0.70, 0.74)	0.49 (0.49, 0.50)	0.52 (0.51, 0.54)	0.67 (0.66, 0.68)	0.58 (0.57, 0.59)	0.63 (0.61, 0.64)	0.81 (0.80, 0.83)	0.64 (0.63, 0.65)
Age: 0-49 vs. 60-69	0.47 (0.46, 0.48)	0.42 (0.41, 0.43)	0.43 (0.42, 0.44)	0.44 (0.43, 0.45)	0.54 (0.53, 0.55)	0.51 (0.50, 0.52)	0.51 (0.50, 0.52)	0.85 (0.84, 0.86)	0.59 (0.59, 0.60)
Age: 50-59 vs. 60-69	0.75 (0.74, 0.76)	0.72 (0.70, 0.74)	0.75 (0.74, 0.77)	0.74 (0.73, 0.76)	0.77 (0.76, 0.78)	0.76 (0.75, 0.77)	0.77 (0.75, 0.78)	0.92 (0.90, 0.93)	0.81 (0.80, 0.81)
Age: 70-79 vs. 60-69	1.21 (1.19, 1.24)	1.43 (1.39, 1.47)	1.18 (1.15, 1.20)	1.33 (1.30, 1.35)	1.21 (1.19, 1.22)	1.16 (1.14, 1.18)	1.03 (1.02, 1.05)	0.98 (0.97, 1.00)	1.11 (1.10, 1.12)
Age: 80+ vs. 60-69	1.14 (1.11, 1.16)	1.82 (1.76, 1.87)	1.00 (0.98, 1.02)	1.47 (1.44, 1.50)	1.20 (1.19, 1.22)	0.96 (0.95, 0.98)	0.50 (0.49, 0.51)	0.82 (0.81, 0.83)	0.96 (0.95, 0.97)
Ethnicity: Asian vs. White	0.90 (0.88, 0.92)	0.84 (0.82, 0.87)	1.00 (0.98, 1.02)	0.97 (0.95, 0.99)	1.05 (1.04, 1.06)	1.00 (0.98, 1.02)	0.98 (0.96, 1.00)	0.58 (0.57, 0.59)	0.91 (0.90, 0.92)
Ethnicity: Black vs. White	0.77 (0.75, 0.79)	0.90 (0.86, 0.94)	0.88 (0.86, 0.91)	0.86 (0.83, 0.88)	1.08 (1.06, 1.10)	1.01 (0.99, 1.03)	0.89 (0.87, 0.91)	0.56 (0.55, 0.57)	0.91 (0.90, 0.93)
Ethnicity: Other vs. White	0.84 (0.81, 0.87)	0.89 (0.85, 0.93)	0.96 (0.93, 0.98)	0.90 (0.87, 0.93)	0.94 (0.92, 0.96)	0.93 (0.90, 0.95)	0.85 (0.82, 0.87)	0.63 (0.62, 0.65)	0.83 (0.82, 0.85)
Deprivation: 2nd most deprived fifth vs. most deprived fifth	0.99 (0.97, 1.01)	1.01 (0.99, 1.04)	0.99 (0.97, 1.00)	0.97 (0.95, 0.99)	0.92 (0.91, 0.93)	1.02 (1.01, 1.04)	1.00 (0.98, 1.01)	0.89 (0.88, 0.90)	0.93 (0.92, 0.94)
Deprivation: 3rd least deprived fifth vs. most deprived fifth	1.05 (1.03, 1.07)	0.99 (0.97, 1.02)	1.02 (1.00, 1.03)	0.96 (0.94, 0.98)	0.91 (0.90, 0.92)	1.04 (1.03, 1.06)	1.02 (1.01, 1.04)	0.84 (0.83, 0.85)	0.92 (0.91, 0.93)
Deprivation: 2nd least deprived fifth vs. most deprived fifth	1.09 (1.07, 1.11)	0.98 (0.95, 1.00)	1.02 (1.00, 1.04)	0.93 (0.91, 0.95)	0.88 (0.87, 0.89)	1.07 (1.05, 1.08)	1.06 (1.05, 1.08)	0.82 (0.81, 0.83)	0.91 (0.90, 0.92)
Deprivation: Least deprived fifth vs. most deprived fifth	1.12 (1.10, 1.15)	0.97 (0.95, 1.00)	1.07 (1.05, 1.09)	0.87 (0.86, 0.89)	0.86 (0.85, 0.87)	1.11 (1.09, 1.13)	1.09 (1.07, 1.10)	0.76 (0.75, 0.77)	0.88 (0.87, 0.89)
BMI: <18.5 vs. 18.5-24.9	0.30 (0.29, 0.32)	0.26 (0.24, 0.28)	0.36 (0.34, 0.38)	0.42 (0.39, 0.44)	0.58 (0.55, 0.60)	0.41 (0.39, 0.43)	n/a	0.60 (0.57, 0.64)	0.66 (0.63, 0.68)
BMI: 25-29.9 vs. 18.5-24.9	1.49 (1.45, 1.52)	1.74 (1.66, 1.82)	1.44 (1.41, 1.47)	1.37 (1.34, 1.40)	1.15 (1.14, 1.16)	1.30 (1.28, 1.32)	n/a	1.06 (1.04, 1.08)	1.12 (1.11, 1.14)
BMI: 30-34.9 vs. 18.5-24.9	1.56 (1.52, 1.60)	1.91 (1.82, 2.01)	1.50 (1.46, 1.53)	1.46 (1.43, 1.50)	1.18 (1.16, 1.19)	1.26 (1.24, 1.28)	n/a	1.05 (1.04, 1.07)	1.13 (1.12, 1.14)
BMI: 35-39.9 vs. 18.5-24.9	1.52 (1.47, 1.56)	1.81 (1.71, 1.92)	1.46 (1.42, 1.49)	1.47 (1.42, 1.51)	1.15 (1.14, 1.17)	1.19 (1.17, 1.21)	n/a	1.02 (1.00, 1.04)	1.10 (1.09, 1.11)
BMI: 40+ vs. 18.5-24.9	1.41 (1.36, 1.45)	1.33 (1.25, 1.41)	1.31 (1.27, 1.35)	1.37 (1.33, 1.42)	1.07 (1.05, 1.09)	1.05 (1.02, 1.07)	n/a	0.97 (0.95, 0.99)	1.01 (1.00, 1.03)
Diabetes Duration: 0 vs. 1-4	0.93 (0.91, 0.95)	1.56 (1.51, 1.61)	1.17 (1.14, 1.19)	1.48 (1.44, 1.51)	0.64 (0.63, 0.65)	0.41 (0.41, 0.42)	1.09 (1.07, 1.11)	1.82 (1.79, 1.86)	0.67 (0.66, 0.68)
Diabetes Duration: 5-9 vs. 1-4	0.91 (0.90, 0.93)	0.94 (0.92, 0.96)	0.91 (0.90, 0.92)	0.95 (0.93, 0.96)	0.94 (0.94, 0.95)	0.97 (0.96, 0.98)	0.95 (0.93, 0.96)	0.89 (0.88, 0.90)	0.93 (0.92, 0.94)
Diabetes Duration: 10-14 vs. 1-4	0.94 (0.92, 0.96)	1.03 (1.00, 1.05)	0.91 (0.89, 0.92)	0.97 (0.96, 0.99)	0.93 (0.92, 0.94)	0.98 (0.96, 0.99)	0.95 (0.94, 0.97)	0.87 (0.85, 0.88)	0.89 (0.88, 0.90)
Diabetes Duration: 15+ vs. 1-4	1.07 (1.05, 1.09)	1.26 (1.22, 1.29)	1.05 (1.03, 1.07)	1.20 (1.18, 1.23)	0.95 (0.94, 0.96)	1.02 (1.00, 1.03)	0.98 (0.96, 0.99)	0.83 (0.82, 0.85)	0.87 (0.86, 0.88)

Text shown in black indicates where there is a significant difference when compared to the reference group (>95% significant).

Text shown in grey indicates where there is not a significant difference when compared to the reference group (>95% significant).

Results are presented as odds ratios with 95% confidence intervals in brackets

<sup>1</sup>c statistic: The probability that predicting the outcome is better than chance. Used to compare the goodness of fit of logistic regression models, values for this measure range from 0.5 to 1.0. A value of 0.5 indicates that the model is no better than chance at making a prediction of membership in a group and a value of 1.0 indicates that the model perfectly identifies those within a group and those not. Models are typically considered reasonable when the c-statistic is higher than 0.7 and strong when the c-statistic exceeds 0.8 (Hosmer & Lemeshow, 1989, 2000).



**Published by the Health and Social Care Information Centre**  
**Part of the Government Statistical Service**

**Responsible Statistician**

Peter Knighton, Principal Information Analyst

This publication may be requested in large print or other formats.

---

For further information:

**[www.hscic.gov.uk](http://www.hscic.gov.uk)**

**0300 303 5678**

**[enquiries@hscic.gov.uk](mailto:enquiries@hscic.gov.uk)**

Copyright © 2014 Health and Social Care Information Centre. All rights reserved.

This work remains the sole and exclusive property of the Health and Social Care Information Centre and may only be reproduced where there is explicit reference to the ownership of the Health and Social Care Information Centre.

This work may be re-used by NHS and government organisations without permission.