

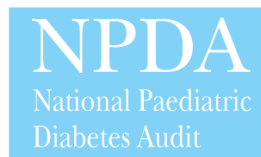
National Paediatric Diabetes Audit Report 2010-11

September 2012

National Paediatric Diabetes Audit

Report 2010-11

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Report produced by the
National Paediatric Diabetes Audit Project Board,
Royal College of Paediatrics and Child Health

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Foreword

We are delighted to introduce the first report for the National Paediatric Diabetes Audit prepared by the Royal College of Paediatrics & Child Health. This is one of 29 national audits and registries funded by the Department of Health through the Healthcare Quality Improvement Partnership.

The report covers the period 2010-2011 and includes all Pediatric Diabetes Units that submitted data in England and Wales. It is the largest paediatric diabetes audit carried out to date in the UK, with a 22.3% increase in patient record returns over the previous year.

Audit data from England and Wales were returned on 23,676 infants, children and young people under the age of 25 years with diabetes. The National Paediatric Diabetes Audit illustrates the quality of care delivered and it is clear that there are many improvements to be made. We hope that clinical teams, NHS managers, and Commissioners will use these audit data to help improve care, its' organisation and delivery.

We acknowledge the contribution of the many NHS clinical teams that submitted data for the National Paediatric Diabetes Audit and thank them for their participation. We also acknowledge the important contribution of the recently established regional paediatric diabetes networks across England, supported by NHS Diabetes, that complement the established equivalent network in Wales. We commend these networks and their coordinators for their support for the National Paediatric Diabetes Audit and their help in achieving such excellent returns.

The RCPCH is privileged to be leading this national programme. Our goal is to see an improvement in the outcomes and experiences of infants, children and young people with diabetes, and their families.



Neena Modi

Neena Modi

Vice President for Science & Research RCPCH and Chair NPDA



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1. Summary of key findings

Coverage of infants, children and young people with diabetes by the National Paediatric Diabetes Audit (NPDA) has increased. Records from 23,676 infants, children and young people with diabetes were submitted to the 2010-11 NPDA, an increase of 22.3% compared with 2009-10.

For England and Wales combined, there were a total of 23,516 infants, children and young people under the age of 25 years registered with diabetes and with a valid age attached to their record, reported from 178 Paediatric Diabetes Units.

The percentage of infants, children and young people 12 years of age and over with all care processes recorded, as recommended by the National Institute for Health and Clinical Excellence (NICE), has increased, and is at the highest since 2004. However this still remains unacceptably low with overall only 5.8% of infants, children and young people with diabetes recorded as having received all eight care processes. This proportion falls far short of similar data from the National Diabetes Audit 2010-11 for adults that shows for England 54.3% and for Wales, 60.0% of adults with diabetes received all nine care processes.

In all age groups, over 85% of all infants, children and young people diagnosed before 2011 had their HbA1c measured. Only 16.4% of males and 15.1% of females achieved the NICE recommended HbA1c target of <7.5%. The greatest numbers of patients have an HbA1c between 7.5% and 9.5%. In Wales, the percentage of infants, children and young people with an HbA1c less than 7.5% is slightly higher than the percentage in England. An encouraging sign is that the percentage achieving an HbA1c of less than 7.5% has increased from 14.5% in 2009-10 to 15.8% in 2010-11. Nearly one third of infants, children and young people with diabetes have an unacceptable HbA1c of >9.5%.

In both England and Wales, using the whole population as a denominator, there has been an increase in the incidence of diabetic ketoacidosis emergency admissions from 2005-6 to 2010-11. Using the current population of infants, children and young people with diabetes as a denominator the incidence of diabetic ketoacidosis emergency admissions has also risen which suggests that the increase cannot be attributed to the improved coverage of the audit.

Note: Care should be taken in comparing the 2010-11 report with previous years' report, as they were prepared by different agencies and there may be differences in eligibility for inclusion in the analyses, and in the methods used.

2. Introduction

The National Paediatric Diabetes Audit (NPDA) report highlights the main findings on the quality of care for infants, children and young people with diabetes mellitus in England and Wales. This is the eighth report and covers data submitted on patients under the age of 25 years cared for in Paediatric Diabetes Units in 2010-11. This is the first report from the Royal College of Paediatrics & Child Health (RCPCH) that was awarded the contract to conduct the NPDA from 1st April 2011. The NPDA is commissioned and sponsored by the Healthcare Quality Improvement Partnership following advice to the Department of Health from the National Clinical Audit Advisory Group.

The NPDA covers the components of the National Service Framework for Diabetes¹ and includes details on the number of infants, children and young people with diabetes in England and Wales, the care processes they receive and outcome measures, including inpatient admissions for diabetic ketoacidosis.

Over the eight years that the NPDA has been the basis for data collection on process and outcome measures of care for infants, children and young people with diabetes there have been many changes in the way services are structured and delivered. In England, with the help of NHS Diabetes, ten Regional Networks have been established, geographically located in former Regional Health Authorities. The development of such Networks should help considerably in the collection of annual audit data and provide a facility for monitoring and benchmarking of services within a region. The ultimate aim is to improve quality of care across a region and remove inequalities of service provision.

Over the last few years there has been a move towards intensification of therapy, including insulin dose adjustment for carbohydrate intake using multiple daily injections and/or continuous subcutaneous insulin infusions. There is also recognition of the need for continuous structured education programmes starting at diagnosis and continuing throughout childhood, adolescence and transition into adult services. In the last year the Department of Health in England has introduced a Best Practice Tariff to fund the service, with the aim of driving up the quality of care and improving outcomes for infants, children and young people with diabetes. Participation in the NPDA is one of the key requirements to receiving the Best Practice Tariff.

The NPDA hope that Paediatric Diabetes Units will use the data presented in this report to benchmark their own centres with others and explore methods of driving up quality of care for their patients. The Royal College of Paediatrics & Child Health and the NPDA would like to thank Paediatric Diabetes Units that have submitted data to the 2010-11 audit. However, the fact that 94.2% of infants, children and young people with diabetes either did not receive all care processes recommended by NICE, or the processes were carried out but not recorded, suggests there is more work to be done to drive improvements. It is recognised that data collection is a time consuming process particularly where there is a lack of resource and/or computer software to aid its' collection. Ease of submission of the data is of upmost priority to the NPDA and is being addressed for the 2011-12 audit period with the provision of a new online submission platform by the Royal College of Paediatrics & Child Health.

3. Coverage and participation

A total of 180 Paediatric Diabetes Units in England and Wales successfully submitted data to 2010-11 NPDA. Data were received from 166 Paediatric Diabetes Units in England which represents over 97% of registered hospitals (171) in England providing paediatric diabetes services and from 14 Paediatric Diabetes Units within the six Welsh Health Boards, comprising all hospitals in Wales providing paediatric diabetes services. This is an increase of 25 Paediatric Diabetes Units over the 2009-10 NPDA, maintaining the upward annual participation trend. The main cause of non-participation by 5 Paediatric Diabetes Units in England was mainly due a lack of resources and technical infrastructure to aid the collection and submission of data. Figure 1 shows the geographical location of the 180 Paediatric Diabetes Units in England and Wales.

Figure 1: Paediatric Diabetes Units that submitted data to the NPDA 2010-11



4. Demographic and population assessment

4.1 Registrations

Records from 23,676 infants, children and young people with diabetes were submitted to the 2010-11 NPDA, an increase of 22.3% compared with 2009-10. A total of 18 records have been excluded from the 2010-11 analysis as they were related to patients over the age of 25 years, or without a valid age. In addition, 2 Paediatric Diabetes Units submitted a total of 142 records, all of which had invalid years of birth leading to their exclusion from the analysis. Therefore, for England and Wales combined, there were a total of 23,516 infants, children and young people under the age of 25 years registered with diabetes and with a valid age attached to their record, reported from 178 Paediatric Diabetes Units.

Table 1 shows the breakdown in registration by age, nation and by region in England. Within England the maximum number of registrations across all age groups was observed in the North West regions closely followed by the East of England. In both England and Wales, age groups 12-15 and 16-19 years comprised the two largest groups of registered infants, children and young people with diabetes.

Table 1: Diabetes registrations by country, age and English Region, 2010-11

Area	Age group					Total
	0-4	5-11	12-15	16-19	20-24	
England and Wales	677	6,395	8,672	7,380	392	23,516
<i>England</i>	634	6,003	8,118	6,825	373	21,953
<i>Wales</i>	43	392	554	555	19	1,563
Regions in England						
<i>North East</i>	21	330	425	463	11	1,250
<i>North West</i>	101	859	1,152	899	24	3,035
<i>Yorkshire and The Humber</i>	59	585	928	768	20	2,360
<i>East Midlands</i>	48	560	725	531	12	1,876
<i>West Midlands</i>	77	647	939	921	75	2,659
<i>East of England</i>	81	758	961	919	73	2,792
<i>London</i>	97	769	944	783	52	2,645
<i>South East</i>	30	407	581	416	10	1,444
<i>South West</i>	69	656	850	610	21	2,206
<i>South Central</i>	51	432	613	515	75	1,686

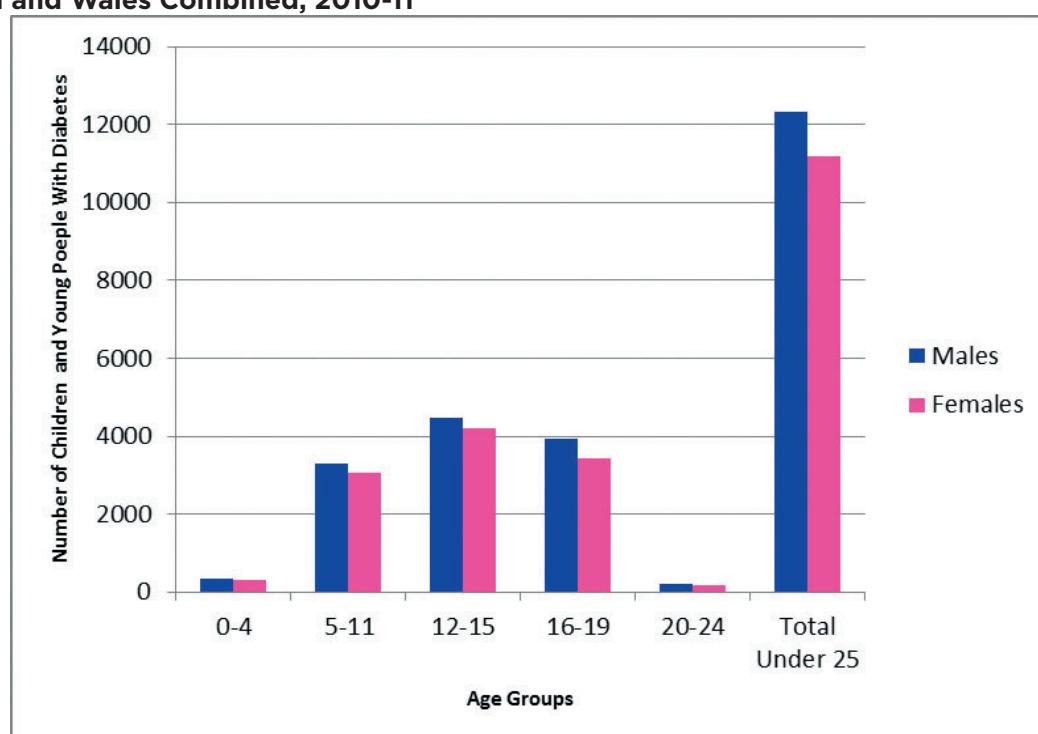
4.1.1 Registrations by Age and Sex

A total of 23,498 out of 23,516 patients had a valid sex assigned to their registration. Table 2 and Figure 2 show registrations for males and females in each age band. As seen above patients in age groups 12-15 and 16-19 comprise the maximum number of registrations in England and Wales. Slightly more young males have been registered with diabetes than females.

Table 2: Number of infants, children and young people with diabetes by age band, for England and Wales combined, 2010-11

Age	0-4	5-11	12-15	16-19	20-24	Total Under 25
Male	361	3,313	4,463	3,953	225	12,315
Female	315	3,078	4,202	3,421	167	11,183
Total *	676	6,391	8,665	7,374	392	23,498

* Total excludes infants, children and young people whose sex have not been specified

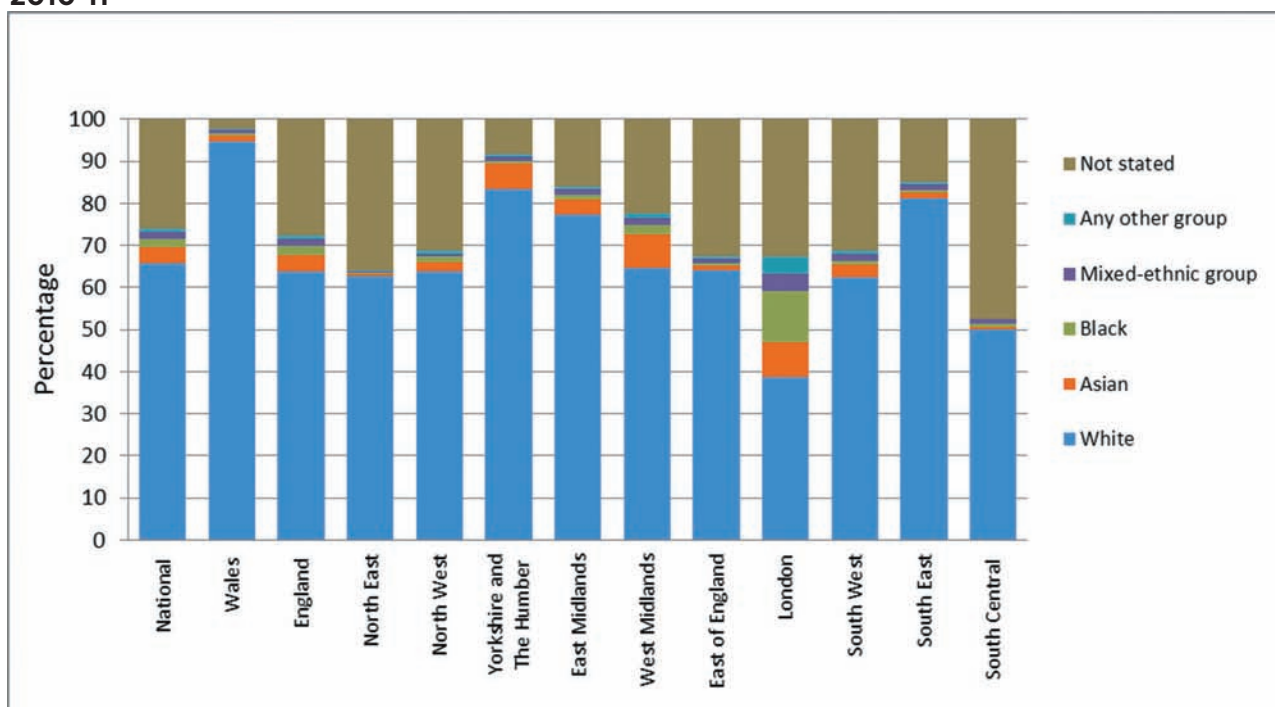
Figure 2: Number of infants, children and young people with diabetes by age band, for England and Wales Combined, 2010-11

4.1.2 Registrations by Ethnicity and Region

Of 23,516 records analysed, 16,018 specified ethnic origin as part of their registration. For Paediatric Diabetes Units in Wales, 98.9% of records provide ethnic origin; the corresponding figure from England is lower at 72.6%. Table 3 and Figure 3 show the percentage of infants, children and young people registered with diabetes by ethnic group for 2010-11. In both England and Wales the largest group was White; in England, Asians and Blacks were the next largest patient ethnic groups. Note that some very small ethnic groups have not been shown, so the percentages do not add up to 100%. "Not stated" is a specific response when parents or children do not wish to provide ethnicity information. In addition there are some records with missing data on ethnicity which are also not shown.

Table 3: Percentage of infants, children and young people with diabetes by ethnic group, 2010-11

Ethnic group	White	Asian	Black	Mixed-ethnic group	Any other group	Not stated
England & Wales	65.9	3.6	2.2	1.5	1.0	25.9
England	63.9	3.8	2.3	1.5	1.5	27.5
Wales	95.9	1.1	0.6	1.1	0.1	2.2
Regions in England						
<i>North East</i>	62.8	0.6	0.2	0.3	0.3	35.8
<i>North West</i>	63.9	2.1	1.3	0.7	0.7	31.2
<i>Yorkshire and The Humber</i>	83.5	5.9	0.7	0.9	0.7	8.3
<i>East Midlands</i>	77.3	3.6	1.1	1.4	0.6	15.9
<i>West Midlands</i>	64.6	8.0	2.3	1.8	1.1	22.3
<i>East of England</i>	64.2	1.1	0.3	1.3	0.5	32.6
<i>London</i>	38.8	8.3	12.1	4.2	3.9	32.7
<i>South West</i>	62.6	3.0	0.7	1.7	0.8	31.3
<i>South East</i>	81.2	1.4	0.5	1.3	0.8	14.8
<i>South Central</i>	49.9	0.6	0.9	1.0	0.2	47.4

Figure 3: Percentage of infants, children & young people with diabetes by ethnic group, 2010-11

4.1.3 Registrations by Diabetes Type

Over 99% of the records submitted to the audit had a diabetes type recorded. Table 4 shows the breakdown of diabetes type by sex, nation and region in England. The vast majority of infants, children and young people have Type 1 diabetes, although there is considerable variability across regions in England. In both England and Wales there were slightly more male patients with Type

1 diabetes than females. The South East of England had the highest percentage of males and females with Type 1 diabetes followed closely by the North East, Yorkshire & Humber and East Midlands. The second major group was those with other specified types of diabetes. Data was not collected in the 2010-11 NPDA as to the make up of this group and this is being addressed for the 2011-12 NPDA.

Table 4: Percentage of infants, children and young people with diabetes by sex and type, for England and Wales, 2010-11

Area	Type 1 Diabetes Mellitus		Type 2 Diabetes Mellitus		Maturity Onset Diabetes of the Young		Other Specified		Not Stated	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
England & Wales	94.4	92.7	1.0	2.5	0.3	0.3	3.3	3.7	0.9	0.9
England	94.3	92.6	1.0	2.4	0.3	0.3	3.4	3.8	1.0	0.9
Wales	96.4	95.4	1.3	3.0	0.2	0.0	2.0	1.4	0.0	0.1
Regions in England										
North East	98.8	97.2	0.6	2.4	0.2	0.0	0.5	0.3	0.0	0.0
North West	94.0	91.8	1.2	2.1	0.6	0.6	4.0	4.8	0.3	0.8
Yorkshire and The Humber	96.3	94.9	1.1	2.8	0.3	0.4	1.7	1.2	0.6	0.6
East Midlands	96.0	95.4	0.8	1.8	0.4	0.2	2.4	2.6	0.4	0.0
West Midlands	92.3	90.5	1.2	2.7	0.0	0.2	1.4	2.3	5.1	4.3
East of England	94.8	93.5	0.5	1.4	0.3	0.3	4.1	4.5	0.2	0.4
London	91.5	88.6	2.4	5.5	0.5	0.2	5.2	5.5	0.5	0.1
South West	91.7	90.7	0.6	1.0	0.2	0.3	5.5	6.4	1.9	1.6
South East	99.2	97.6	0.3	1.3	0.0	0.1	0.5	1.0	0.0	0.0
South Central	91.0	88.3	0.4	1.3	0.1	0.3	8.4	9.5	0.1	0.8

* Because of rounding to one decimal place, the total may not add to 100.0 per cent.

4.1.4 Registrations by Diabetes Type and Ethnicity

Table 5 shows the breakdown of infants, children and young people with diabetes by type and ethnicity. There is a much higher proportion of infants, children and young people with Type 2 diabetes in both Asian and Black ethnicities compared to white and mixed ethnic groups.

Table 5: Percentage of infants, children and young people with diabetes by type and ethnic group, England and Wales 2010-11

	Ethnic group	White	Asian	Black	Mixed-ethnic group	Other	Not stated
England	Diabetes type						
	Type 1 Diabetes Mellitus	94.6	80.5	82.5	91.2	85.4	93.3
	Type 2 Diabetes Mellitus	0.9	7.7	8.4	2.1	5.8	1.8
	MODY*	0.3	0.4	0.2	0.6	0.0	0.3
	Other Specified	4.0	10.7	8.2	5.3	8.0	1.7
	Not Specified	0.2	0.7	0.8	0.9	0.9	2.9
Wales	Type 1 Diabetes Mellitus	96.5	70.6	87.5	93.3	100.0	85.7
	Type 2 Diabetes Mellitus	1.7	29.4	12.5	0.0	0.0	4.8
	MODY*	0.1	0.0	0.0	0.0	0.0	0.0
	Other Specified	1.6	0.0	0.0	6.7	0.0	4.8
	Not Specified	0.0	0.0	0.0	0.0	0.0	4.8
England and Wales	Type 1 Diabetes Mellitus	94.8	80.3	82.5	91.3	85.7	93.3
	Type 2 Diabetes Mellitus	1.0	8.1	8.4	2.0	5.6	1.8
	MODY*	0.3	0.4	0.2	0.6	0.0	0.3
	Other Specified	3.8	10.5	8.0	5.4	7.8	1.7
	Not Specified	0.2	0.7	0.8	0.8	0.9	2.9

* Maturity Onset Diabetes of the Young

4.2 Incidence rates

4.2.1 Incidence Rates by Country

This section includes age and sex-specific diabetes population incidence for 2010-11. Recent evidence suggests that the incidence of Type 1 diabetes in children is rising and may double by 2020, which has important health care implications.² NPDA time trends need to be interpreted with caution as increase may be due to better coverage of infants, children and young people with diabetes by the audit rather than a true increase in incidence. The age-specific incidence rate is defined as the number of newly diagnosed cases of diabetes in a specific age group over a specific time period (i.e. 2010-11 year period) per total number of infants, children and young people in that age group in the general population. Table 6 and Figure 4 show incidence rates by age and sex for England and Wales and combined in 2010-11. In England and Wales age group 12-15 years had the highest rate of incidence of Type 1 diabetes closely followed by those in age groups 5-11 and 16-19 years. In England and Wales, males had a marginally higher rate of incidence than females for 2010-11. Note that the number of patients in the age group 20-24 years is small, and because many patients will have moved to adult services, the rate in this age group will not represent a true rate.

Table 6: Type 1 Diabetes Incidence Rates per 100,000 Persons by Age Group & Sex, 2010-11

	England		Wales		England & Wales	
Age group	Males	Females	Males	Females	Males	Females
0-4	11.2	11.5	18.0	5.9	11.5	11.2
5-9	29.5	28.7	32.6	26.8	29.7	28.6
10-14	41.5	41.3	50.8	47.8	42.0	41.7
15-19	20.8	11.9	21.5	14.5	20.8	12.1
20-24	0.1	0.0	0.0	0.0	0.1	0.0
Under 25	19.6	17.7	23.4	18.1	19.8	17.7

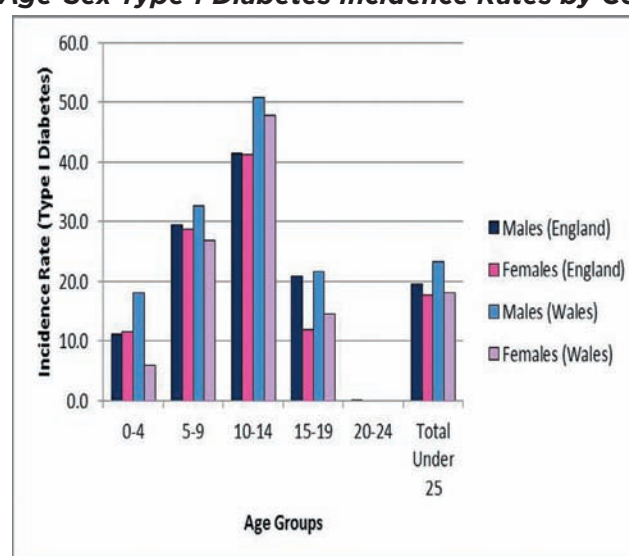
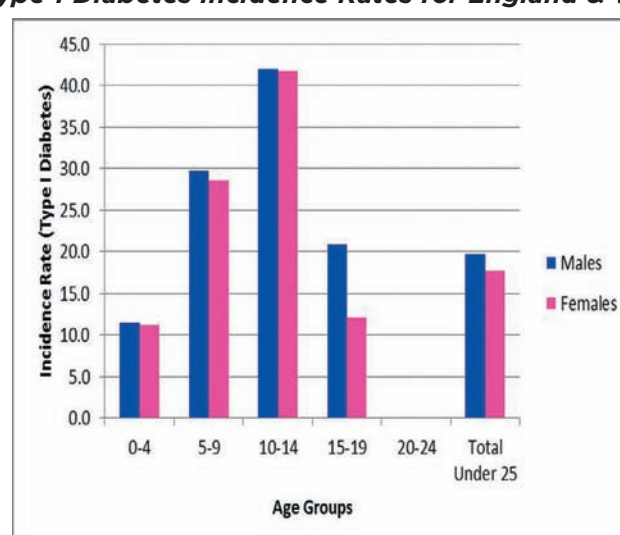
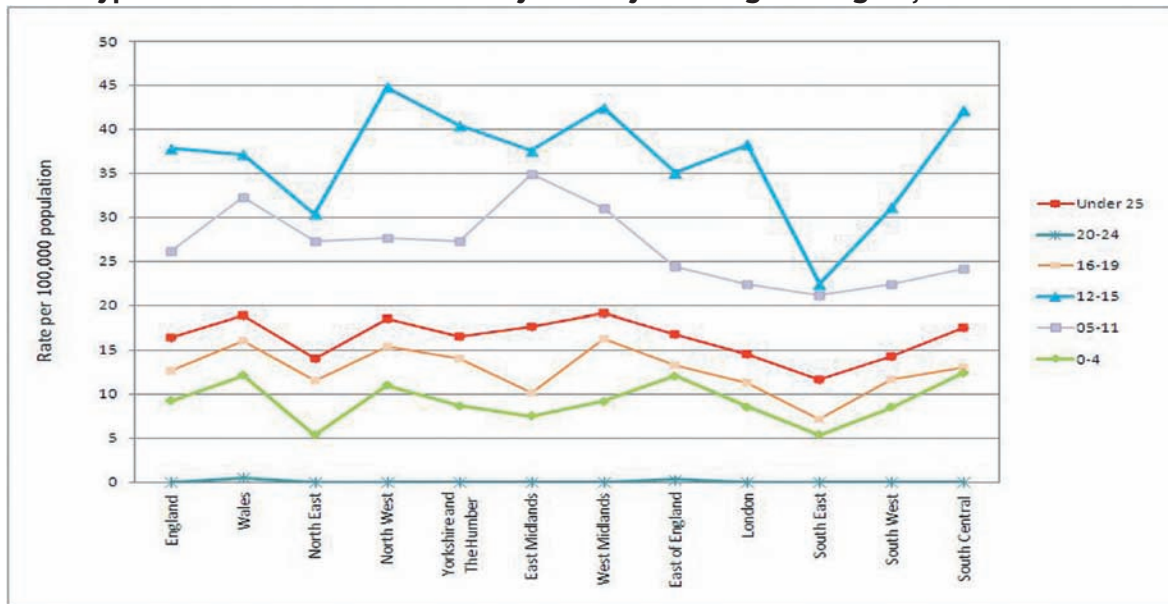
Figure 4: Type 1 Diabetes Incidence Rates per 100,000 Persons by Age Group & Sex, 2010-11**4a) Age-Sex Type 1 Diabetes Incidence Rates by Country****4b) Age-Sex Type 1 Diabetes Incidence Rates for England & Wales Combined**

Figure 5 shows the incidence rate (numbers of new cases per 100,000 age-specific population) in 2010-11, by country and by English region. It can be seen that in each region, age group 12-15 years had the highest incidence per 100,000 persons in that age group followed by those in age group 5-11 years. In addition the incidence rate in England for all infants, children and young people with diabetes under 25 years is lower than the rate in Wales. Among all the regions in England, the North East and the South East regions have lower incidence rate of Type 1 diabetes.

Figure 5: Type 1 diabetes incidence rate by country and English Region, 2010-11



5. Care processes & treatment targets

Audit question: What proportion of infants, children and young people with diabetes are getting the key processes of diabetes care and what proportion achieve treatment targets?

The NPDA collects information on the key care processes, recommended by the National Institute for Health and Clinical Excellence (NICE), for infants, children and young people with diabetes.³ The audit measures the percentage of infants, children and young people with diabetes who are receiving the key processes of care which include:

- Glycated Haemoglobin A1c (HbA1c)
- Body Mass Index (BMI)
- Blood pressure
- Urinary albumin
- Blood creatinine
- Cholesterol
- Eye screening
- Foot examination

Key care processes are recorded to monitor diabetes management and detect long term complications at the earliest treatable stage. Not all of the care processes outlined are recommended for children of all ages. Guidelines specify a starting age of 12 years for commencing most care processes, whereas HbA1c should be measured in infants, children and young people of all ages. The NPDA incorporates data collection for the age relevant care process and provides analysis on this information.

5.1 Care Processes

Definitions may differ between the 2010-11 report and previous years, but there has been a steady improvement over time in performance of each care process (Table 7). However in 2010-11 only 951 of 16,444 (5.8 per cent) infants, children and young people with diabetes aged 12 to 24 years had all the care processes recorded. In 2009-10 the corresponding figures were 498 out of 12,204 (4.1 per cent). Therefore in 2010-11, 94.2% of infants, children and young people with diabetes either did not receive all care processes recommended by NICE, or the processes were carried out but not recorded.

The National Diabetes Audit 2010-11 for adults shows that, for England, 54.3% of adults received all nine care processes (an increase of 2.9 percentage points since 2009-2010), and that for Wales, 60.0% of adults received all nine care processes (an increase of 2.5 percentage points since 2009-2010).⁴ The percentage of infants, children and young people 12 years and older with all care processes recorded has increased and is at its' highest since 2004, but despite this increase, the proportion receiving all checks is far short of the proportion in the adult audit. Table 7 and Figure 6 show these time trends in recording of care processes.

Table 7: Percentage of infants, children and young people having key age-specific care processes recorded, 2004-05 to 2010-11

	Care Processes Recorded (%)						
	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
HbA1c	73.2	77.6	84.7	89.1	89.6	90.1	92.8
BMI	50.5	53.0	60.5	73.2	66.0	70.2	75.3
Blood Pressure	44.1	40.6	53.3	60.1	57.1	58.8	62.7
Urinary Albumin	18.7	23.3	30.3	34.1	32.2	36.5	40.3
Blood Creatinine	20.1	20.6	26.8	33.8	30.7	33.1	38.8
Cholesterol	18.2	17.5	22.6	32.1	30.5	29.9	34.9
Eye Screening	17.7	15.3	25.2	25.7	26.9	25.8	35.8
Foot Exam	17.4	15.4	21.3	23.5	23.1	24.5	31.9
% with all care processes measured	2.0	2.6	3.6	5.0	5.2	4.1	5.8

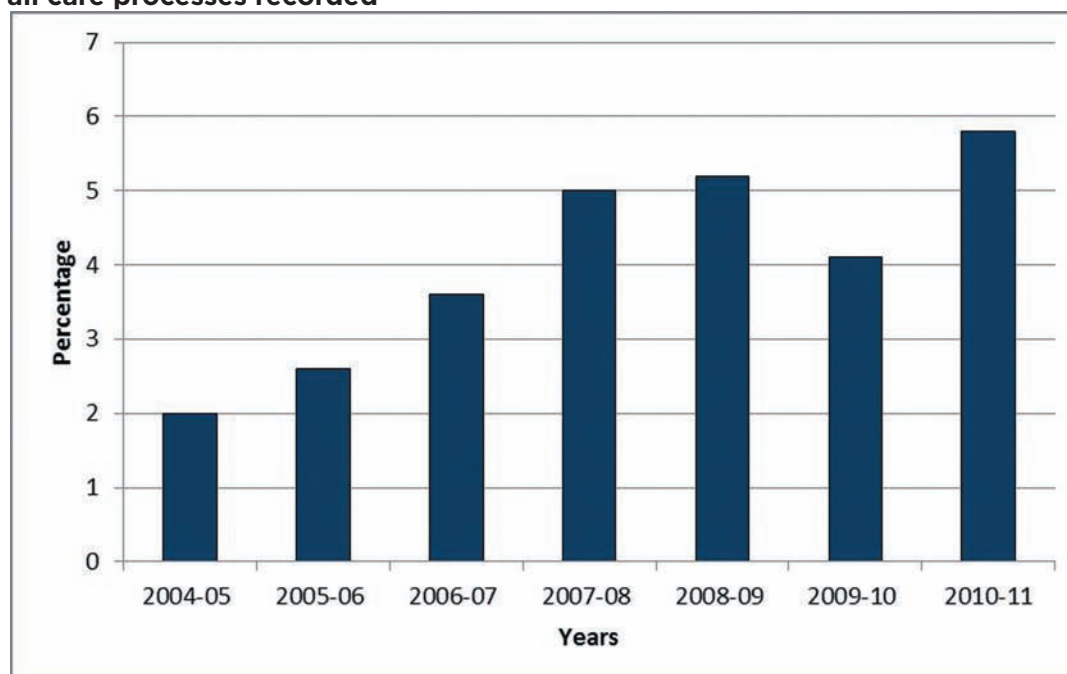
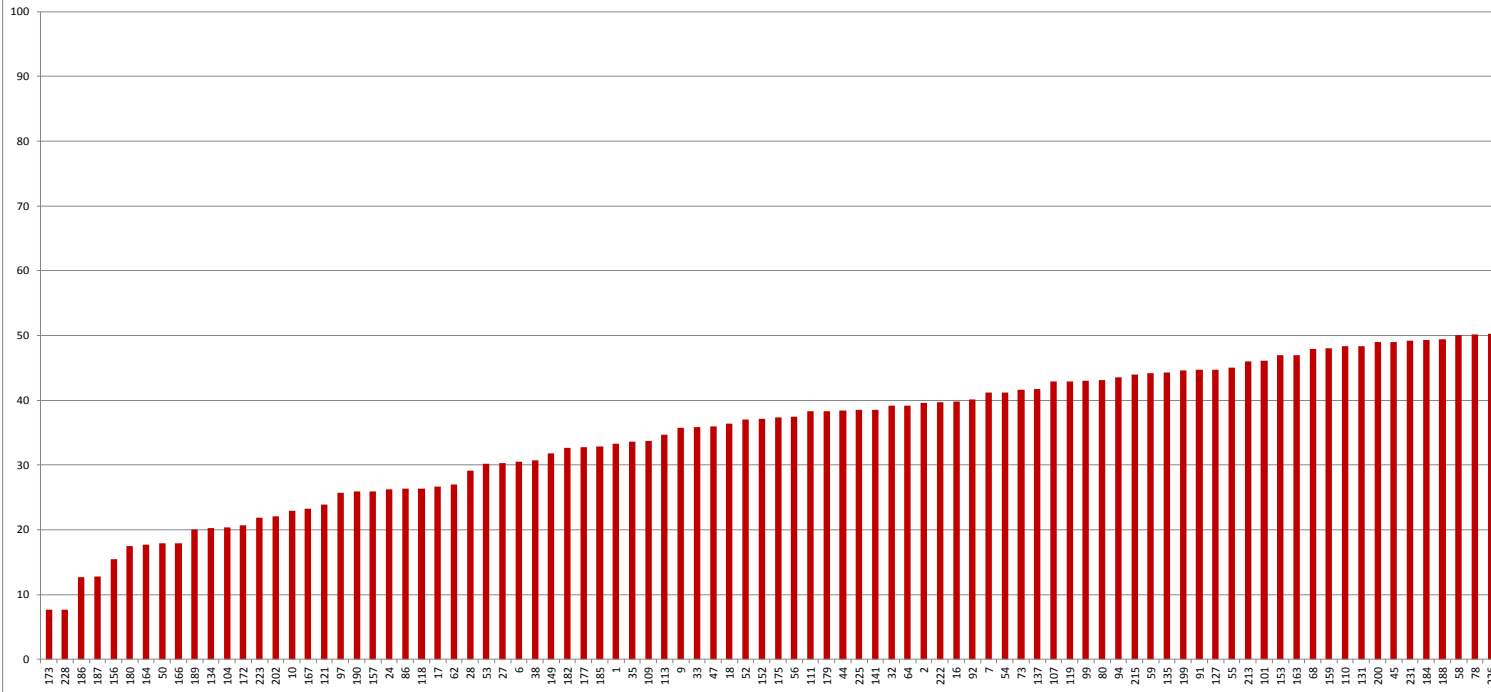
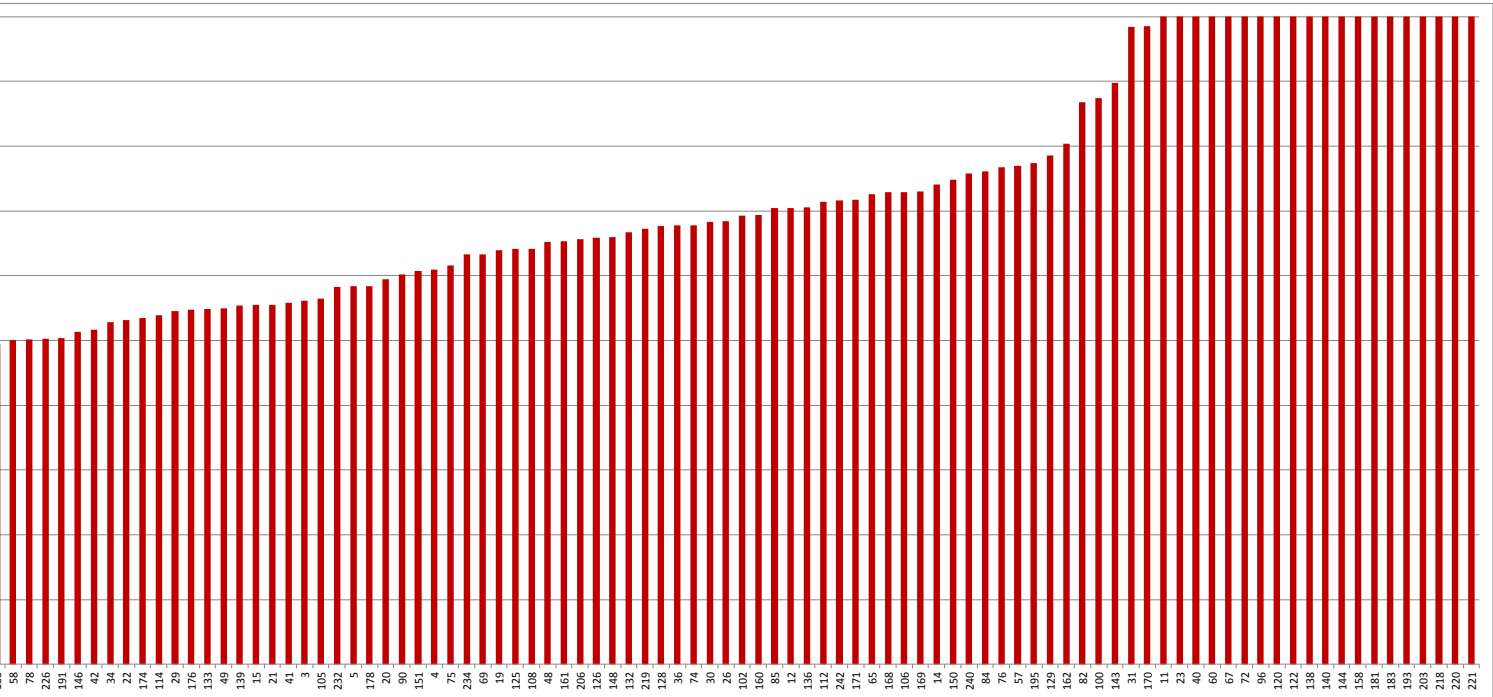
Figure 6: Percentage of infants, children & young people with diabetes aged 12 years and over, having all care processes recorded

Figure 7 shows the percentage of missing values for care processes by Paediatric Diabetes Unit (apart from HbA1c). These care processes include measurement of cholesterol, blood pressure, blood creatinine, urinary albumin, body mass index, eye screening and foot examination; the percentage of data incompleteness is shown by Paediatric Diabetes Unit. Individual Units can be identified in Appendix A.

Figure 7: Percentage of missing values for care processes combined (except HbA1c) by Paediatric Diabetes Unit, 2010-11



Paediatric Diabetes Unit code, refer to Appendix A for names of units concerned



5.2 HbA1c Analysis

This section focuses specifically on HbA1c as it is recommended as the best indicator of long term diabetes control.³ The following analysis examines the percentage of infants, children and young people, of all ages, who had their HbA1c checked and recorded. It must be noted that the HbA1c submitted is a single value during the audit period. The NPDA advises Paediatric Diabetes Units to submit the latest record of HbA1c within the audit period. However, there is no way of validating that this is the case, so care must be taken when comparing results. As HbA1c is a measure of long term control, data on infants, children and young people diagnosed in 2011 are not included; 21,007 infants, children and young people out of 22,809 (diagnosed before 2011) had their HbA1c recorded and with a valid value. A total of 1,802 records were excluded from the HbA1c analysis (1636 records where the HbA1c process had not been supplied and 166 where the value was invalid).

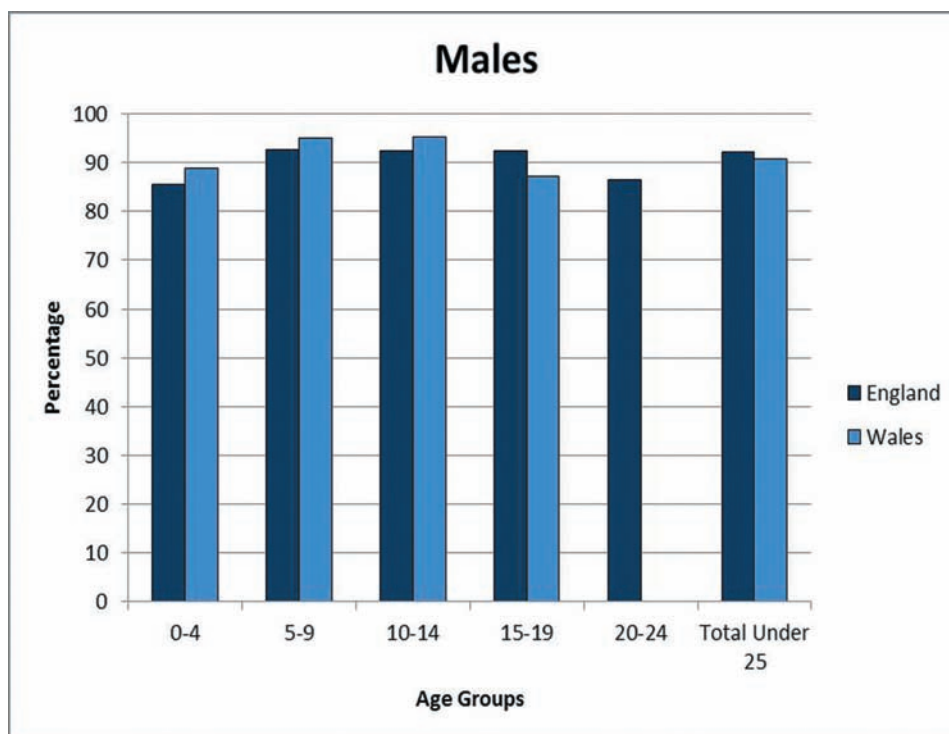
Table 8 and Figure 8 show the percentage of infants, children and young people in different age groups by sex that had their HbA1c measured. In England 92% of males and females under the age of 25 years had their HbA1c measured. In all age groups over 85% of all infants, children and young people diagnosed before 2011 had their HbA1c measured. More females had their HbA1c measured in Wales than in England.

Table 8: Percentage of infants, children and young people with HbA1c measured, by age and sex, 2010-11

England						
	Males (HbA1c Recorded)	Males Diagnosed Before 2011	% of Males with HbA1c Recorded	Females (HbA1c Recorded)	Females Diagnosed Before 2011	% of Females with HbA1c Recorded
0-4	248	290	85.5	221	256	86.3
5-9	1617	1746	92.6	1400	1531	91.4
10-14	3826	4138	92.5	3707	4002	92.6
15-19	4442	4809	92.4	3909	4244	92.1
20-24	192	222	86.5	145	166	87.3
Total Under 25	10325	11205	92.1	9382	10199	92.0
Wales						
	Males (HbA1c Recorded)	Males Diagnosed Before 2011	% of Males with HbA1c Recorded	Females (HbA1c Recorded)	Females Diagnosed Before 2011	% of Females with HbA1c Recorded
0-4	24	27	88.9	9	9	100.0
5-9	97	102	95.1	75	78	96.2
10-14	236	248	95.2	246	259	95.0
15-19	316	362	87.3	281	299	94.0
20-24	0	3	0.0	1	1	100.0
Total Under 25	673	742	90.7	612	646	94.7

Figure 8: Percentage of infants, children and young people with HbA1c measured, by age and country, 2010-11

8a) Percentage of males who had their HbA1c measured in England and Wales



8b) Percentage of females who had their HbA1c measured in England and Wales

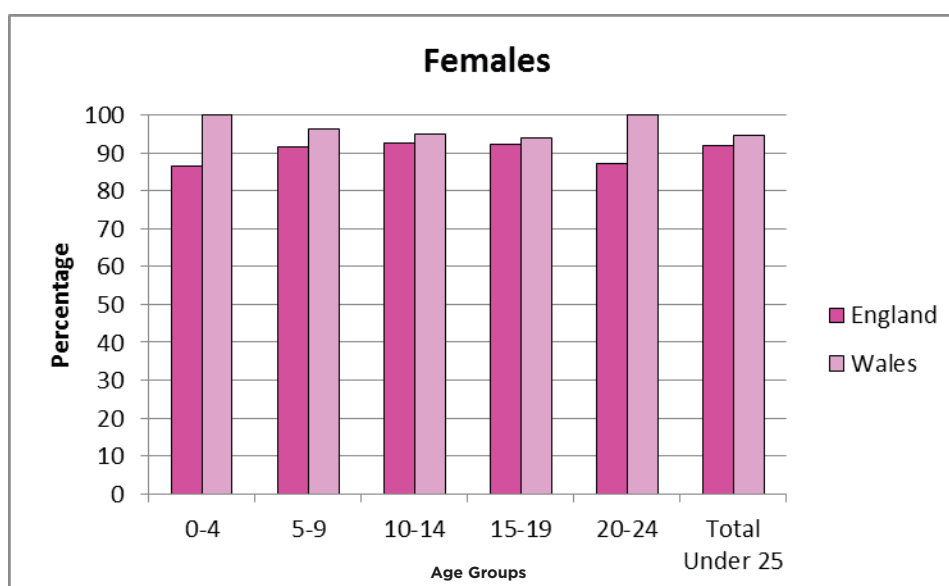
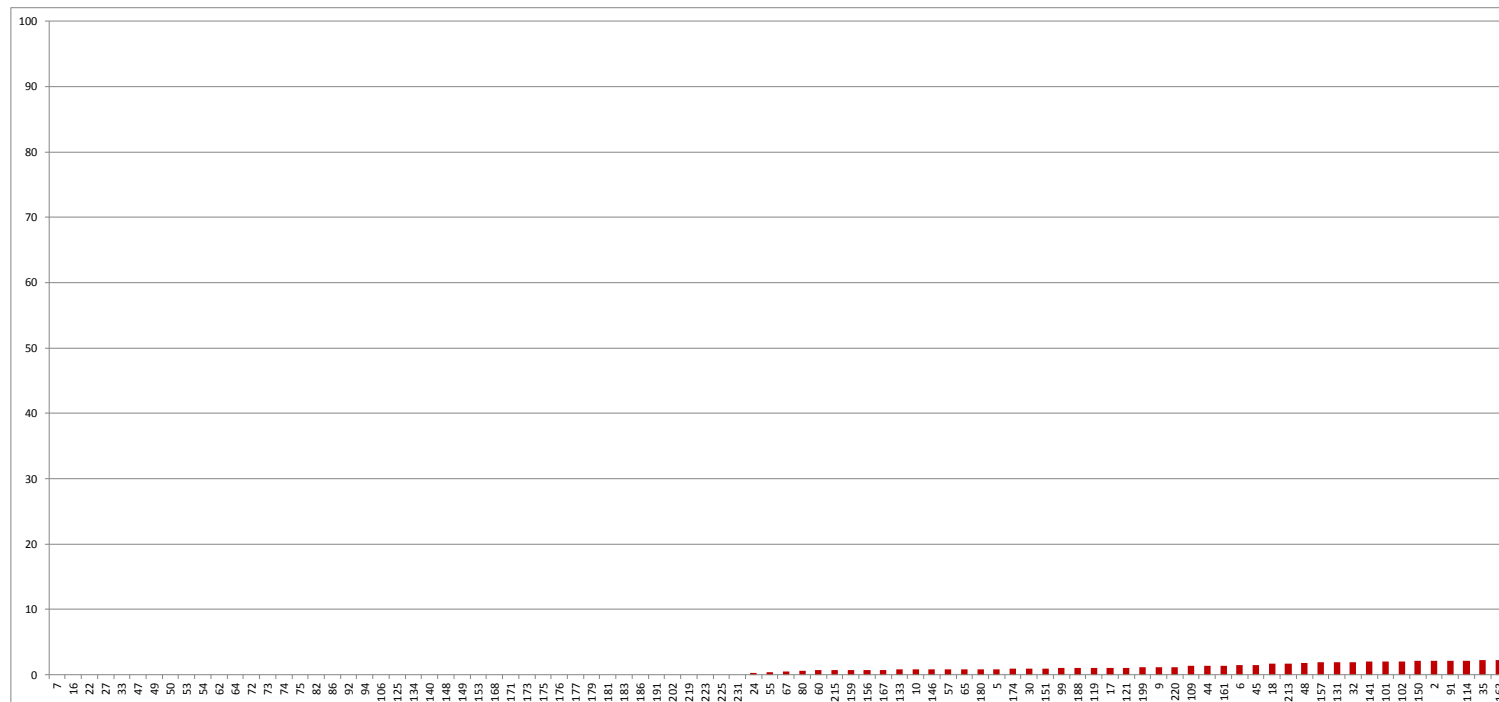
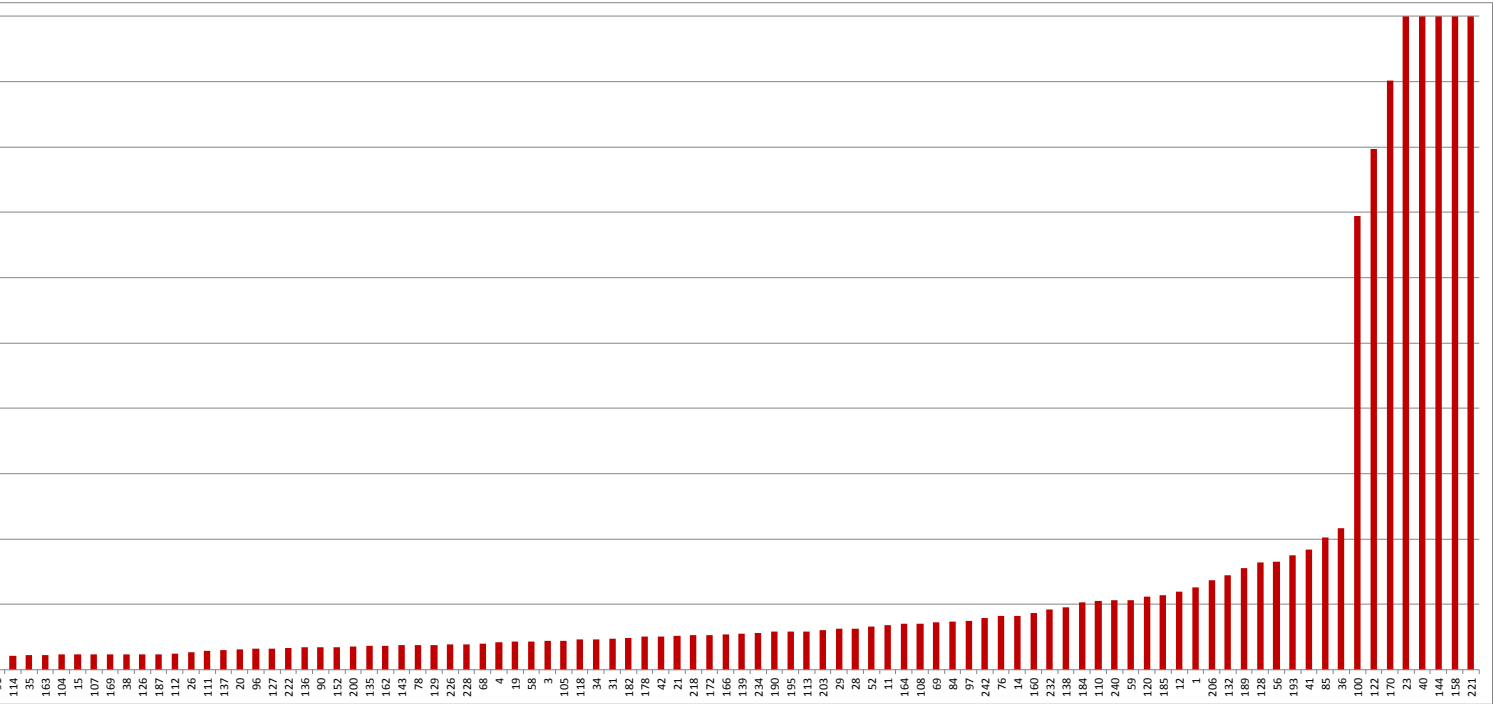


Figure 9 shows the percentage of infants, children and young people under 25 years of age in each Paediatric Diabetes Unit who did not have their HbA1c care process completed in England and Wales in 2010-11. Five Paediatric Diabetes Units had no HbA1c values recorded for their patients and 43 recorded an HbA1c for all their patients. Most of the Paediatric Diabetes Units have a non-completion rate of less than 20%. Appendix A shows the percentage of infants, children and young people with diabetes who did not have their HbA1c recorded by Paediatric Diabetes Unit.

Figure 9: Percentage who did NOT have the HbA1c care process completed, England and Wales by Paediatric Diabetes Unit*, 2010-11



*A list of Paediatric unit code and a corresponding name can be found in Appendix A



6. Outcomes of care

6.1 Treatment targets

Treatment targets can be viewed as part of the process of care or as an “intermediate outcome”, i.e. an intermediary step between a care process (what is done to the patient) and a “hard” endpoint such as development of complications.

6.1.1 HbA1c Target Achievement

Figure 10 shows the percentage of infants, children and young people with diabetes achieving the NICE recommended HbA1c target ranges of <7.5%, ≥7.5% to ≤9.5%, and >9.5% by country in 2010-11. Table 9 shows the percentage of infants, children and young people with diabetes achieving the HbA1c target ranges of <7.5%, ≥7.5% to ≤9.5%, and >9.5% by country and sex, 2010-11. HbA1c values can now also be expressed in millimoles per mole (mmol/mol), and several Paediatric Diabetes Units reported all their values in these units. For this year’s report, HbA1c values submitted as mmol/mol have been converted to percentages. However, some Paediatric Diabetes Units have submitted single values outside the valid range for HbA1c percentages, so it is not clear if these are in mmol/mol or erroneous. Only 16.4% of males and 15.1% of females achieve a target HbA1c of <7.5% nationally. The greatest number of patients have their HbA1c recorded as between 7.5% and 9.5%. In Wales, the percentage of children and young people with HbA1c less than 7.5% is slightly higher than the percentage in England. Almost one third of infants, children and young people with diabetes have an HbA1c of >9.5%.

Figure 10: Percentage of infants, children and young people achieving the NICE recommended HbA1c target of <7.5%, ≥7.5% to ≤9.5%, and >9.5%, by country, 2010-11

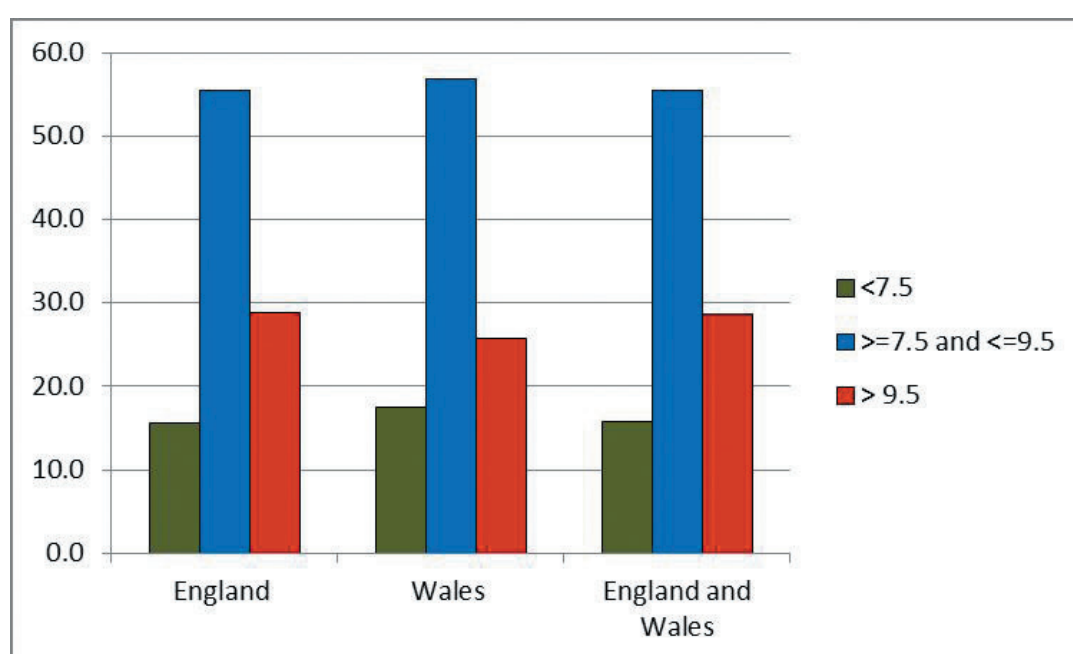


Table 9: Percentage of infants, children and young people with diabetes achieving the HbA1c target of <7.5%, ≥7.5% to ≤9.5%, and >9.5%, by country and sex, 2010-11

	<7.5%			≥7.5% and ≤9.5%			> 9.5%		
Country	Males	Females	Total	Males	Females	Total	Males	Females	Total
England	1678	1415	3093	5809	5120	10929	2838	2847	5685
(%)	(16.3)	(15.1)	(15.7)	(56.3)	(54.6)	(55.5)	(27.5)	(30.3)	(28.8)
Wales	129	96	225	371	359	730	173	157	330
(%)	(19.2)	(15.7)	(17.5)	(55.1)	(58.7)	(56.8)	(25.7)	(25.7)	(25.7)
England & Wales	1807	1511	3318	6180	5479	11659	3011	3004	6015
(%)	(16.4)	(15.1)	(15.8)	(56.2)	(54.8)	(55.5)	(27.4)	(30.1)	(28.7)

Table 10 shows the percentage of infants, children and young people with diabetes by HbA1c target band achieved, for England and Wales, for 2009-10 and 2010-11. An encouraging sign is that the percentage achieving an HbA1c of less than 7.5% has increased from 14.5% in 2009-10 to 15.8% in 2010-11.

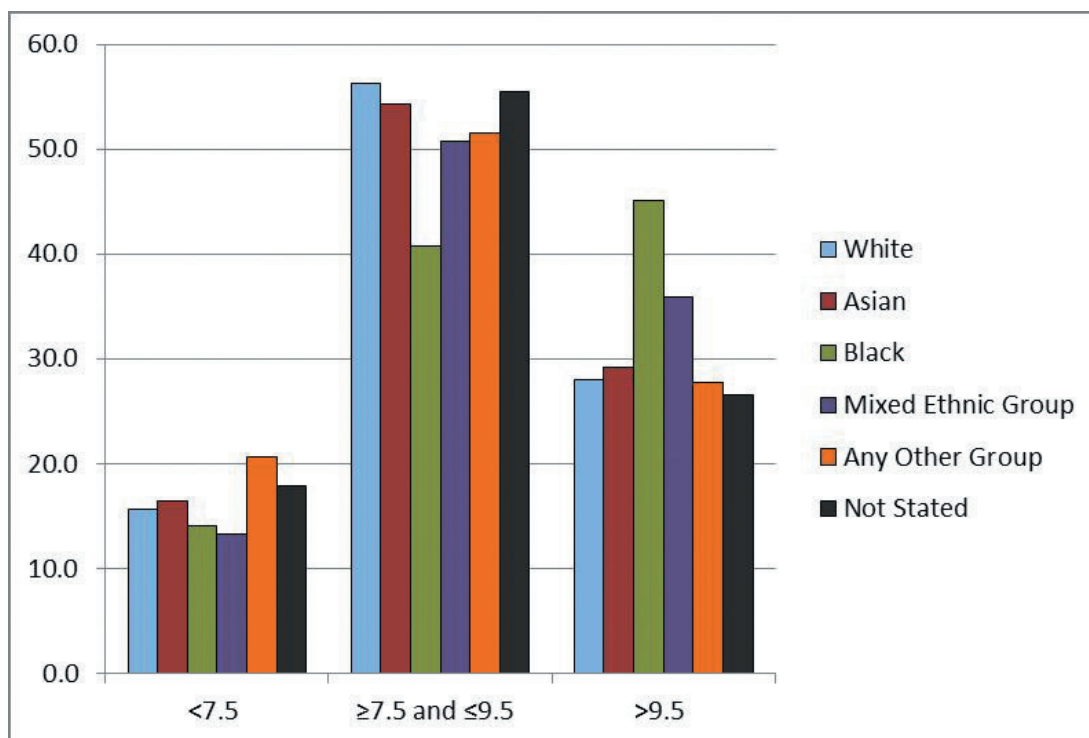
Table 10: Percentage by HbA1c target band achieved, England and Wales, 2009-10 and 2010-11

	England		Wales		England and Wales	
HbA1c Target Band	2009-10	2010-11	2009-10	2010-11	2009-10	2010-11
≤6.5%	4.1	4.3	4.6	4.6	4.1	4.3
> 6.5 and <7.5%	10.4	11.4	10.2	12.9	10.4	11.5
Total <7.5%	14.5	15.7	14.8	17.5	14.5	15.8
≥ 7.5 and ≤9.5%	54.7	55.5	55.7	56.8	54.8	55.5
> 9.5 and ≤11.5%	22.0	21.0	21.6	17.8	22.0	20.8
> 11.5 and ≤13.5%	6.3	5.6	6.1	6.0	6.3	5.7
> 13.5 and ≤15.5%	2.2	2.0	1.7	1.9	2.1	2.0
> 15.5 and ≤17.5%	0.3	0.2	0.1	0.0	0.2	0.2
> 17.5%	0.0	0.0	0.0	0.0	0.0	0.0

Figure 11 and Table 11 show HbA1c target band achieved (percentage and number) by ethnic group, in 2010-11. The “Any other” ethnic group has the highest percentage achieving the target HbA1c of <7.5%, with the lowest in the “Mixed” ethnic group. “Black” and “Mixed ethnic” groups had the highest percentage of infants, children and young people with HbA1c > 9.5%.

Figure 12 shows percentage achievement of HbA1c target of <7.5 per cent, England and Wales combined by Paediatric Diabetes Unit, in 2010-11. Appendix A shows the individual Paediatric Diabetes Unit data.

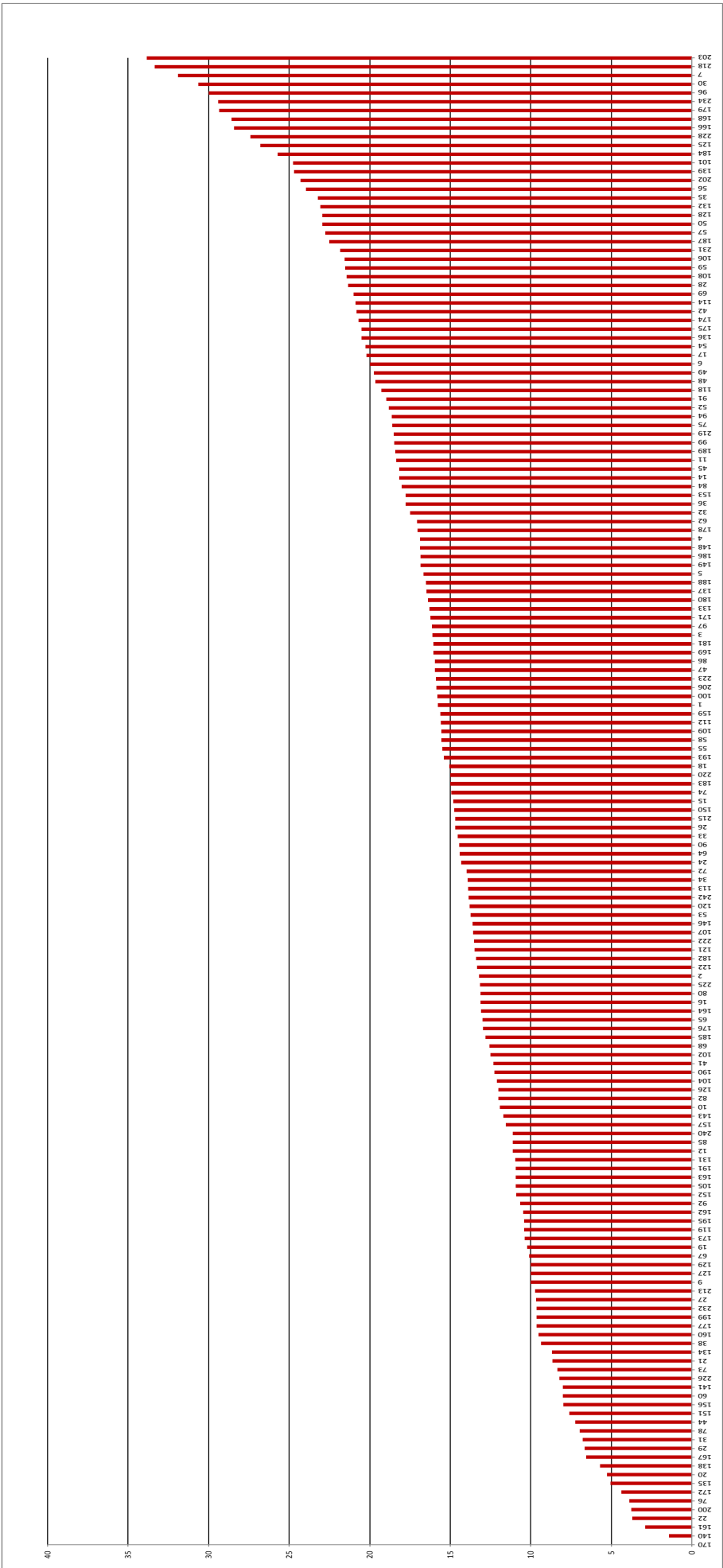
For some healthcare interventions, especially surgical operations, outcomes or results are better the larger the number of patients treated. Figure 13 shows the same achievement data as Figure 12, but as a scatterplot to crudely measure any correlation between the number of patients treated by the Paediatric Diabetes Unit and achievement of the HbA1c target. The correlation is low ($R^2 = 0.0236$), suggesting that patient numbers have a limited affect on HbA1c target achievement. Further statistical analysis will be undertaken to confirm this.

Figure 11: Percentage of infants, children and young people with diabetes by HbA1c target band achieved (%) and Ethnic Group, 2010-11**Table 11: HbA1c target band achieved (% and number) by ethnic group, 2010-11**

HbA1c target band		White	Asian	Black	Mixed-ethnic group	Any other group	Not stated
<7.5 %	Number	2161	117	62	43	41	523
	%	15.6	16.5	14.1	13.3	20.7	17.9
≥7.5 and ≤9.5 %	Number	7792	384	180	164	102	1619
	%	56.3	54.2	40.8	50.8	51.5	55.5
>9.5 %	Number	3879	207	199	116	55	774
	%	28.0	29.2	45.1	35.9	27.8	26.5

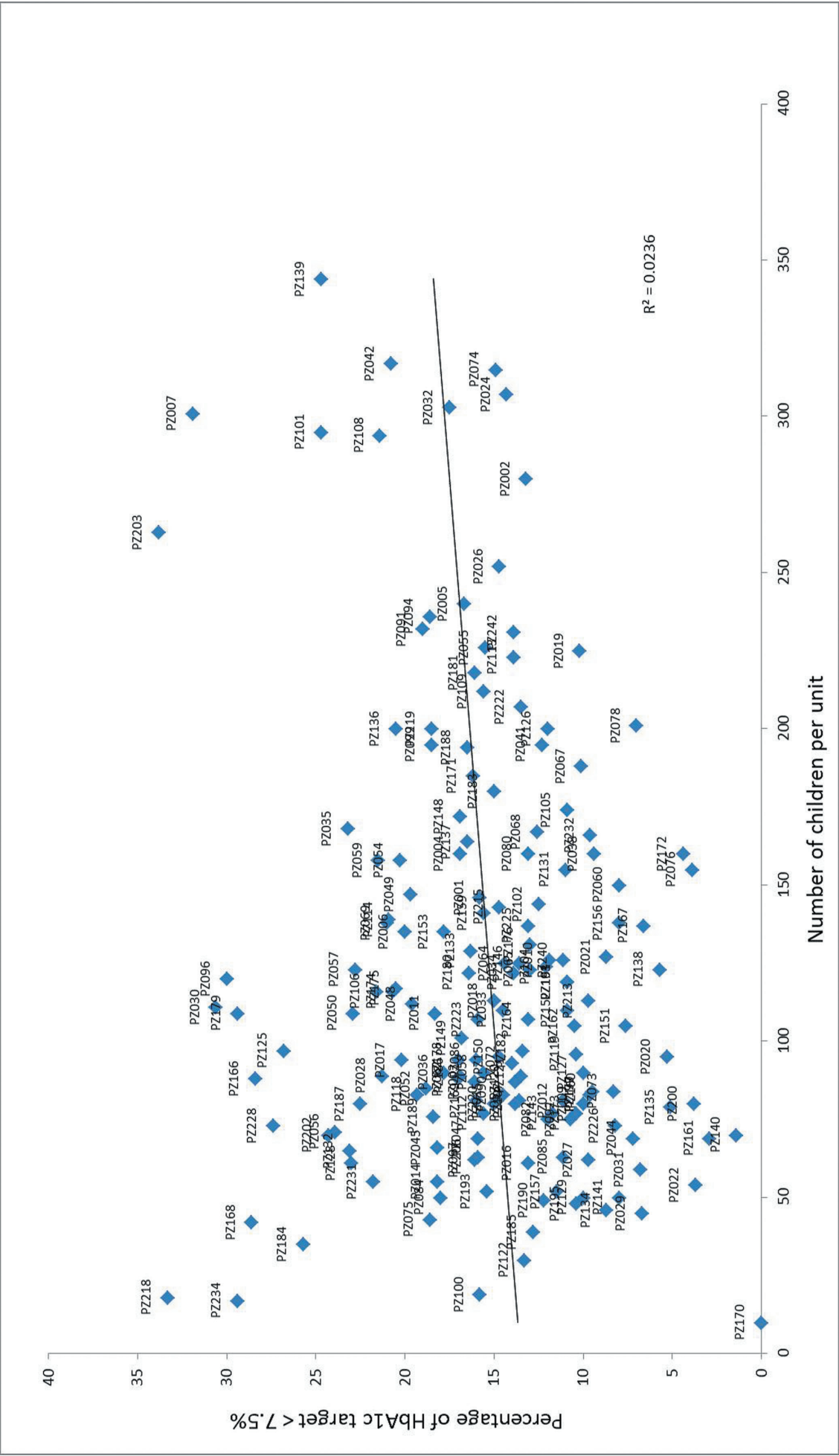
Note: percentages in Table 11 do not add to 100 per cent because of missing ethnicity data.

Figure 12: Percentage achievement of HbA1c target of <7.5 per cent, by Paediatric Diabetes Unit,* 2010-11



* A list of Paediatric Diabetes Unit codes and corresponding names and proportion of infants, children and young people with HbA1c <7.5% can be found in Appendix A

Figure 13: Percentage achieving HbA1c value of < 7.5 per cent by Paediatric Diabetes Unit* and number of patients, 2010-11



6.1.2 Paediatric Diabetes Unit Variation in HbA1c

Table 12 shows mean, median and interquartile range for HbA1c for England, Wales and the English Regions. The mean and median for all Regions are similar, with means ranging between 8.7 and 9.2 and median between 8.4 and 8.9. Note that in this table London and South East have been combined for analysis, as this reflects current network arrangements.

Table 12: Baseline values and statistics for mean, median, standard deviation and interquartile ranges for HbA1c% by country and region in England

	Mean	Median	Standard deviation	25 th percentile	75 th percentile	Interquartile range
England	8.9	8.7	1.7	7.8	9.8	2.0
Wales	8.9	8.6	1.7	7.8	9.7	1.9
Regions in England						
London and South East	9.0	8.7	1.8	7.8	9.9	2.1
East of England	9.2	8.9	1.7	8.1	9.2	1.1
Yorkshire & The Humber	9.0	8.7	1.7	7.8	8.9	1.1
East Midlands	8.8	8.5	1.6	7.7	9.5	1.8
West Midlands	9.1	8.8	1.8	7.9	10.0	2.1
North East	9.1	8.8	1.6	7.9	9.9	2.0
North West	8.9	8.6	1.7	7.8	9.7	1.9
South Central	8.7	8.4	1.6	7.7	9.4	1.7
South West	8.9	8.7	1.6	7.8	9.7	1.9

The following box plots (Figure 14 to Figure 23) show the median, interquartile range and outlying values of HbA1c measurements by Region and by Paediatric Diabetes Unit (refer to Appendix A for the identification of each Paediatric Diabetes Unit). There were 9 Units excluded from the box plots which submitted invalid and / or missing data. (Please refer to Appendix A for details.) The Paediatric Diabetes Units have been separated by the various countries and regions in England.

Figure 14: Box and whisker plots of HbA1c by Paediatric Diabetes Unit, Wales

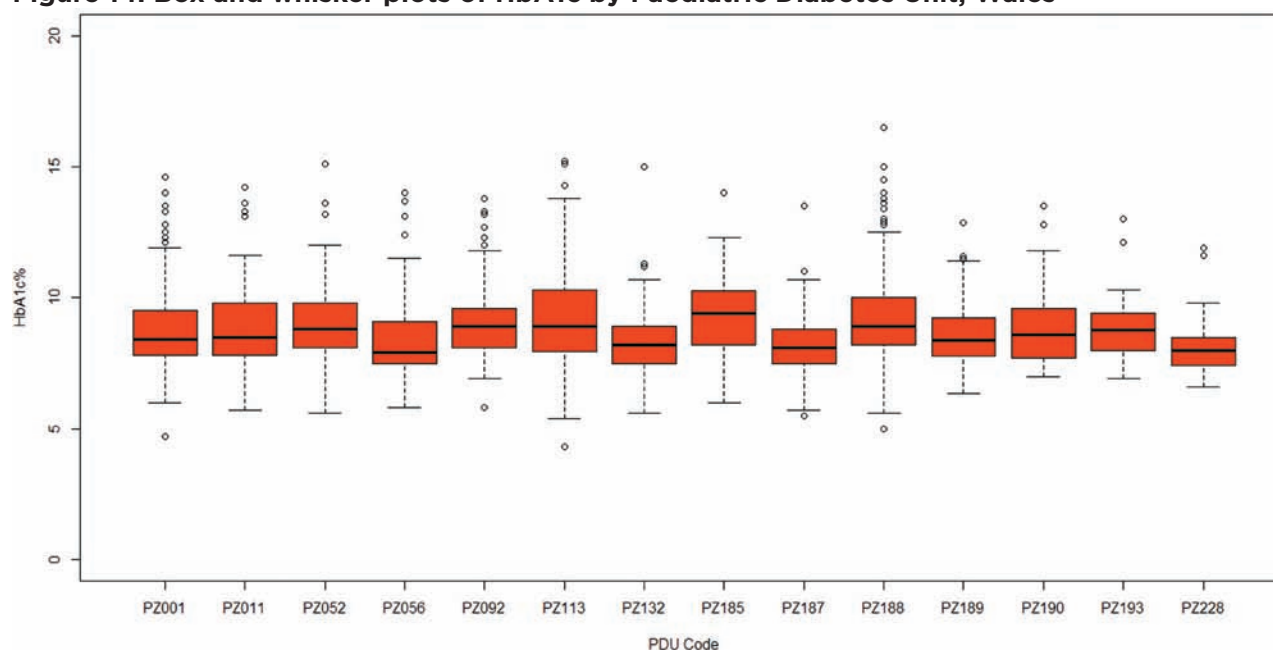


Figure 15: Box and whisker plots of HbA1c by Paediatric Diabetes Unit, East England

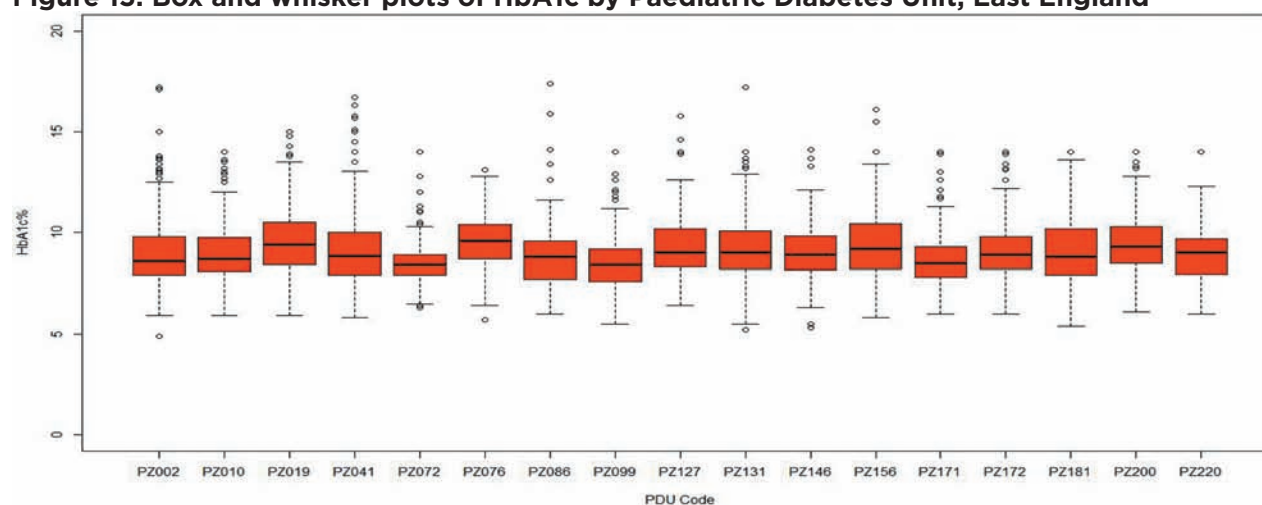


Figure 16: Box and whisker plots of HbA1c by Paediatric Diabetes Unit, Yorkshire & Humber

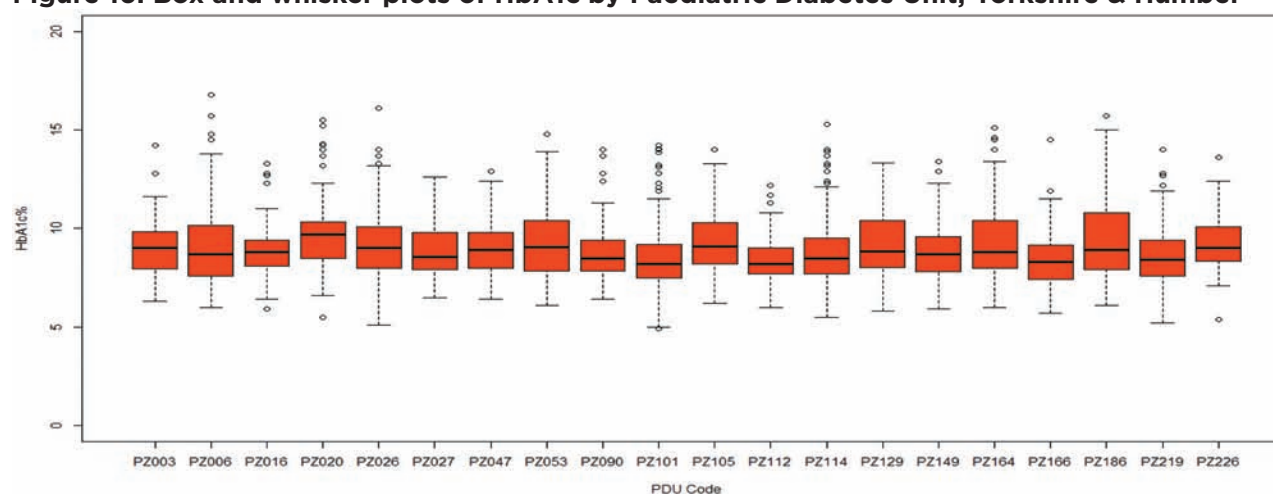


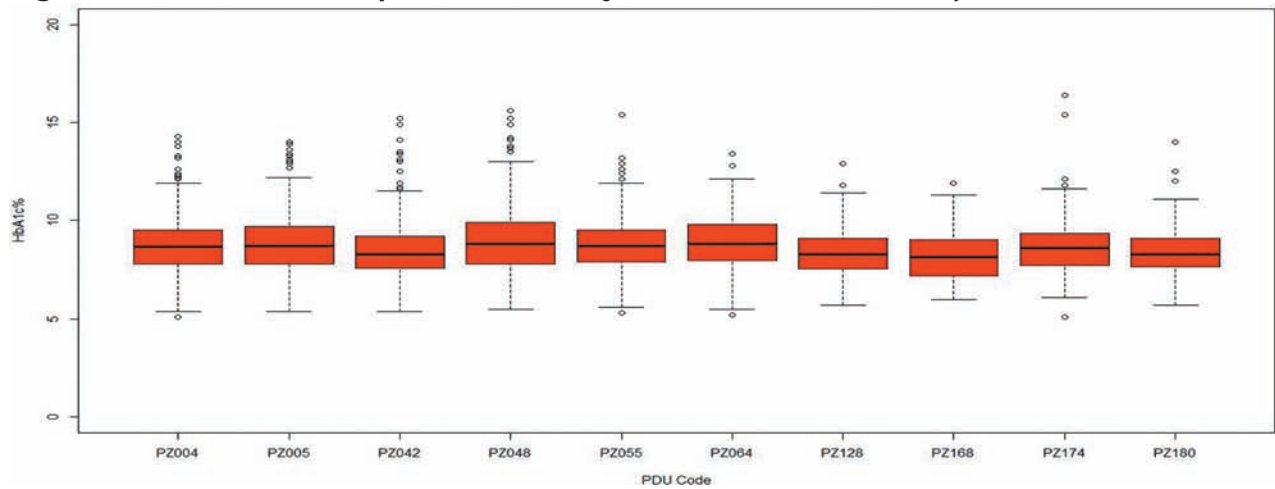
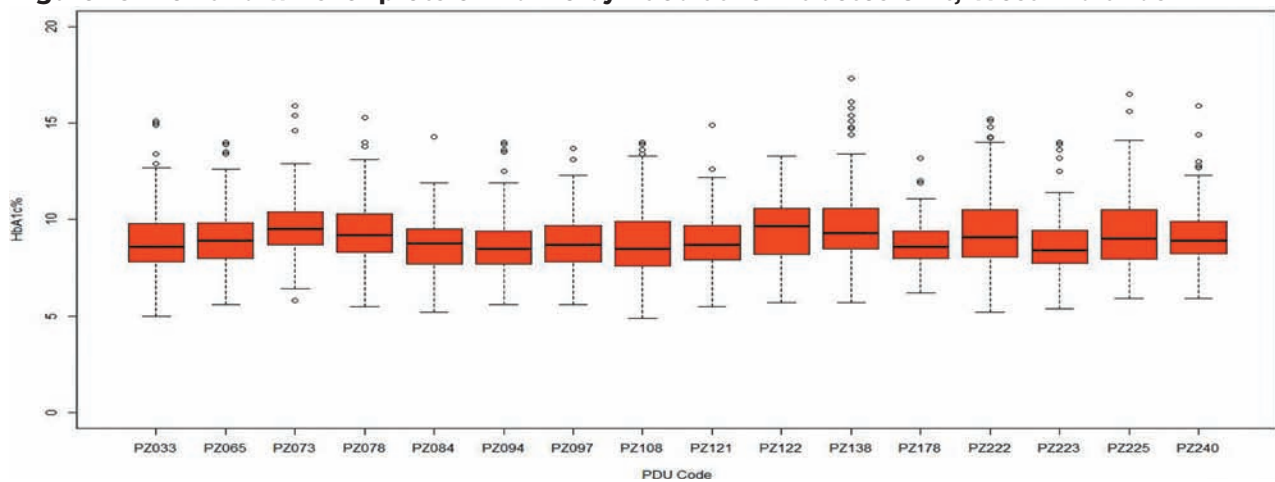
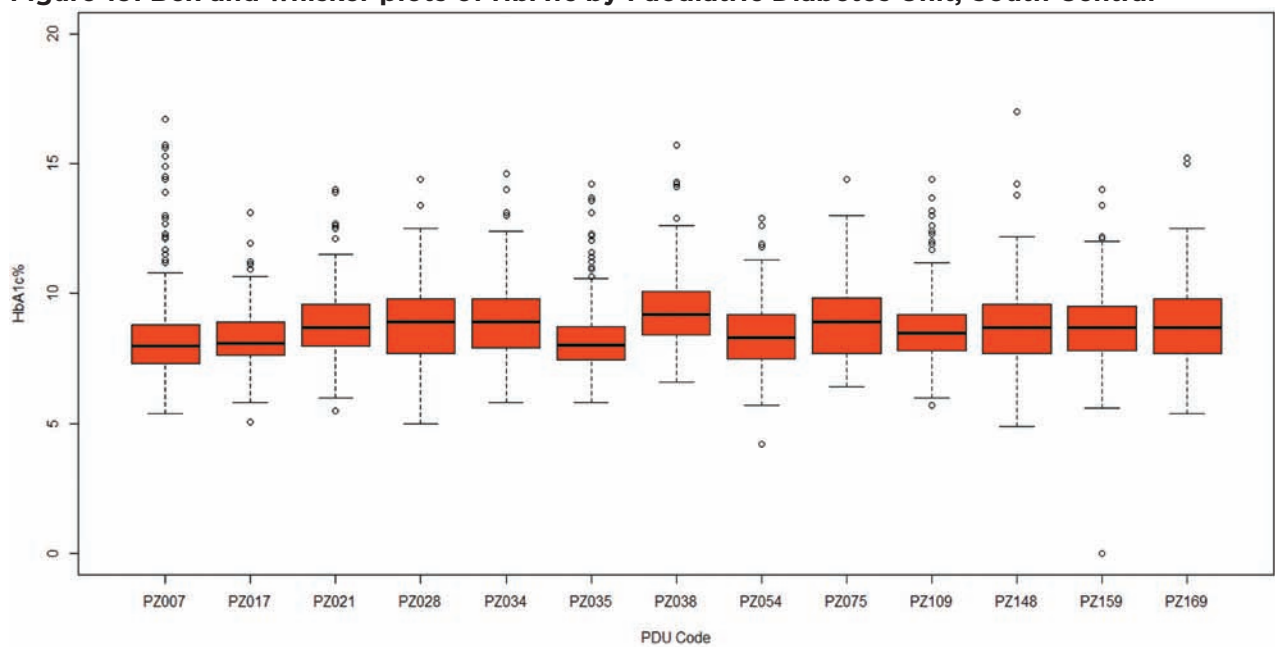
Figure 17: Box and whisker plots of HbA1c by Paediatric Diabetes Unit, East Midlands**Figure 18: Box and whisker plots of HbA1c by Paediatric Diabetes Unit, West Midlands****Figure 19: Box and whisker plots of HbA1c by Paediatric Diabetes Unit, South Central**

Figure 20: Box and whisker plots of HbA1c by Paediatric Diabetes Unit, North West

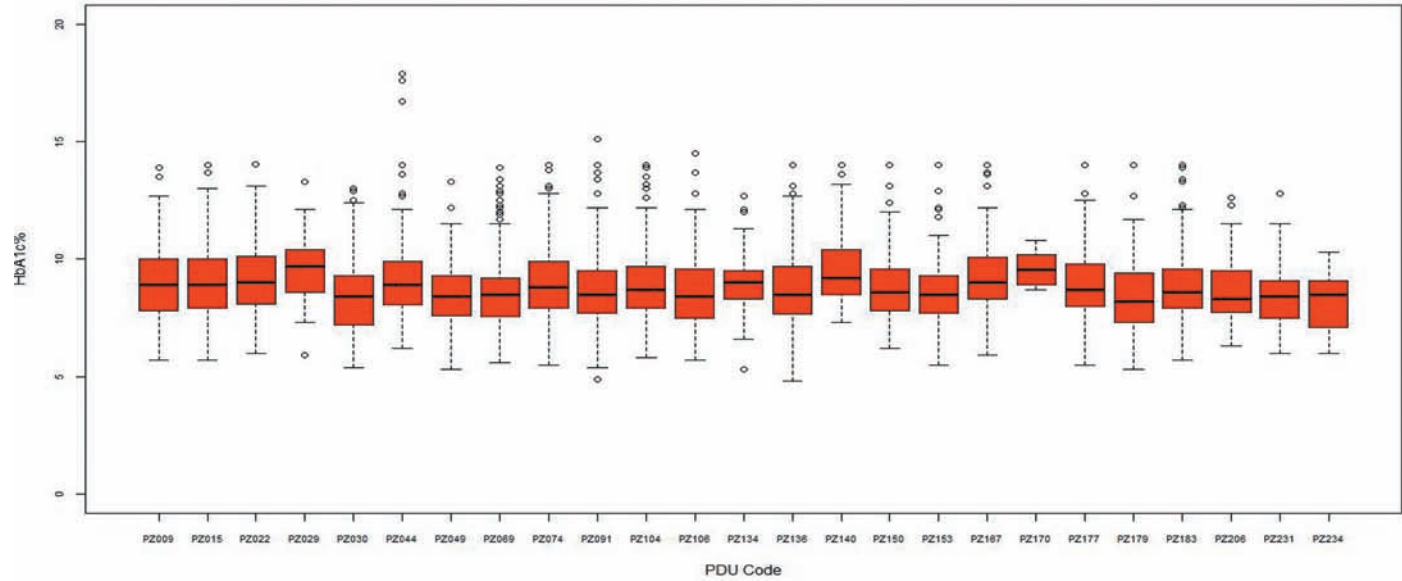


Figure 21: Box and whisker plots of HbA1c by Paediatric Diabetes Unit, North East

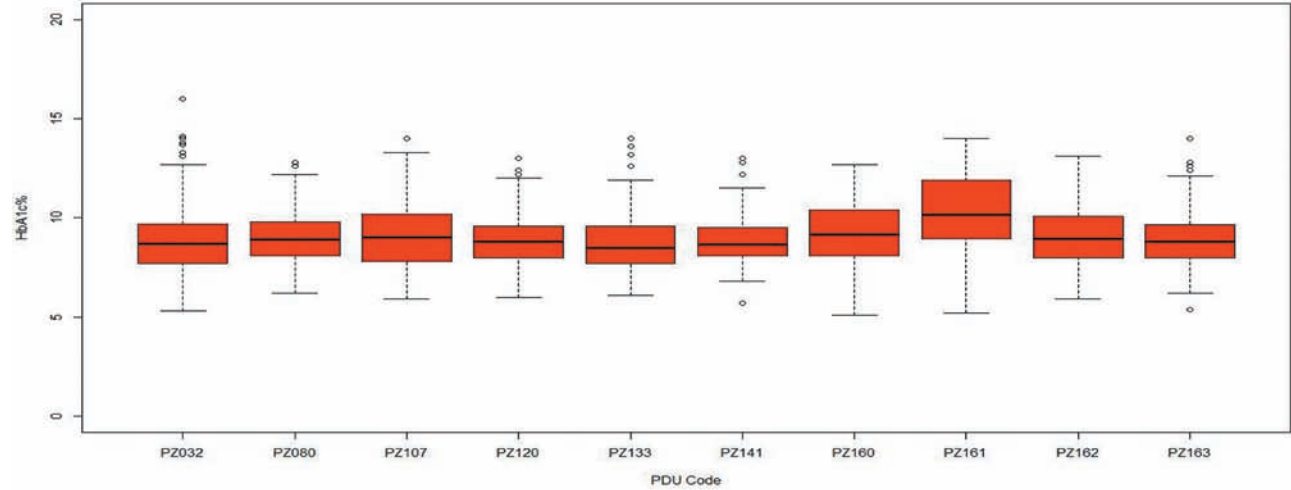


Figure 22: Box and whisker plots of HbA1c by Paediatric Diabetes Unit, South West

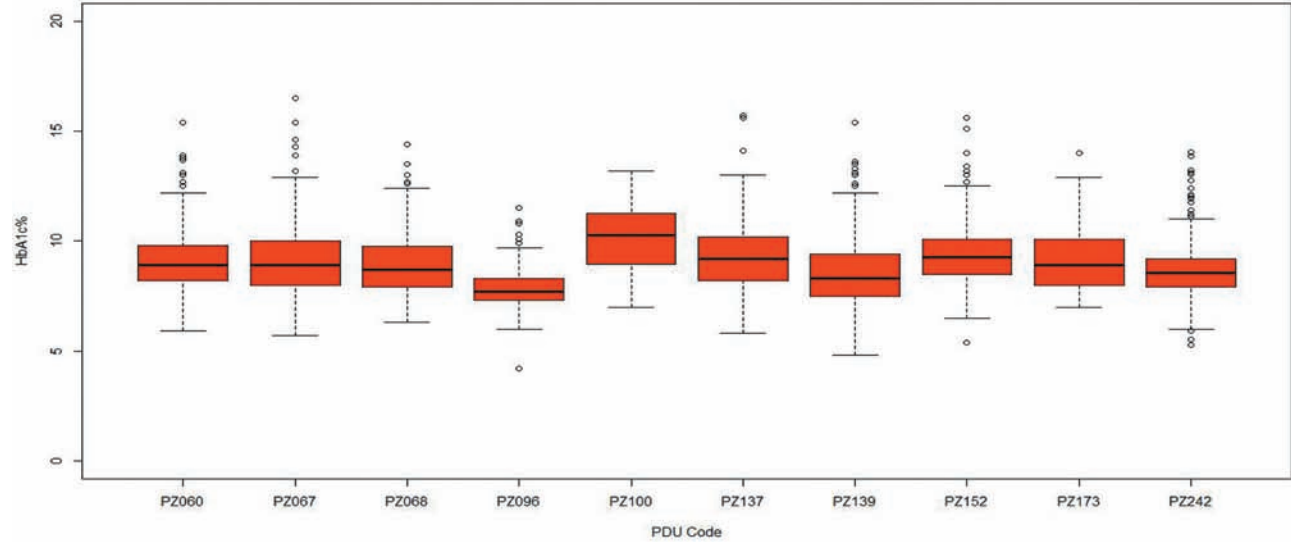
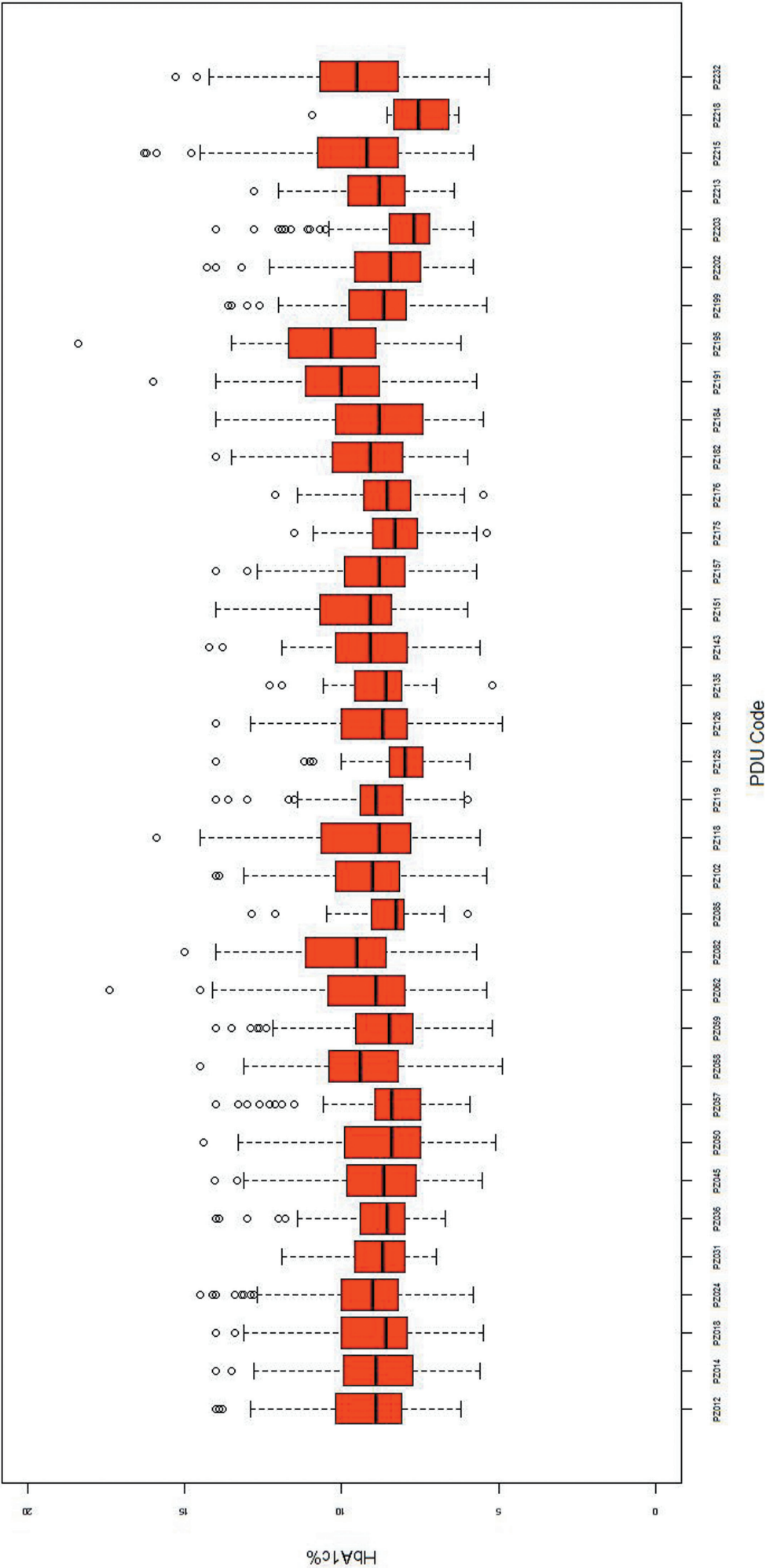


Figure 23: Box and whisker plots of HbA1c by Paediatric Diabetes Unit, London and the South East



6.2 Hospital admissions for diabetic ketoacidosis

This section investigates hospital admissions for which the main reason for admission i.e. primary diagnosis is diabetic ketoacidosis. NHS-funded hospitals in England and Wales provide hospital admission data to the Hospital Episode Statistics (HES) and Patient Episode Data Wales (PEDW) databases respectively, with diagnoses coded using the World Health Organisation's International Classification of Diseases 10th revision (ICD-10), 3rd edition, which is in use in most countries.

Diabetic ketoacidosis (DKA) is one of the acute complications of Type 1 diabetes mellitus. DKA is a severe metabolic derangement caused by insulin deficiency and fluid and electrolyte imbalance. Late diagnosis, improper or delayed treatment and improper monitoring increases the morbidity and mortality. As such it is important to recognise the incidence of DKA in order to understand where there might be potential gaps in medical care for infants, children and young people with diabetes, and where costs to patients and the NHS might be improved.

Two types of admission incidence rates can be calculated:

1. using the whole age-specific population as the denominator (section 6.2.1), OR
2. using the "prevalent" population i.e. the number of patients with diabetes, as the denominator (section 6.2.2).

Along with counts of the actual numbers of admissions, method 1 is useful as a way of showing the need for NHS inpatient services for diabetes. If, for example, the prevalence of diabetes is rising, the number of admissions could rise as well. Using the later prevalent population only as the denominator would not reveal this requirement. On the other hand, using the prevalent population as the denominator- method 2 is the best way to answer the question: is the risk of admission in patients with diabetes reducing as a result of better care by Paediatric Diabetes Units? We have therefore used both denominators to illustrate these different objectives. Previous years' reports used only method 2.

6.2.1 Burden of DKA on patients and the NHS

Table 13 shows the incidence rates of DKA hospital admissions per 100,000 persons as indicated in the HES and PEDW databases in England and Wales from 2005-06 to 2010-11. These are calculated using total population as denominator as estimated by the Office of National Statistics. Detailed tables for England and Wales showing the incidence numbers, rates and confidence intervals broken down by sex are given in Appendix B.

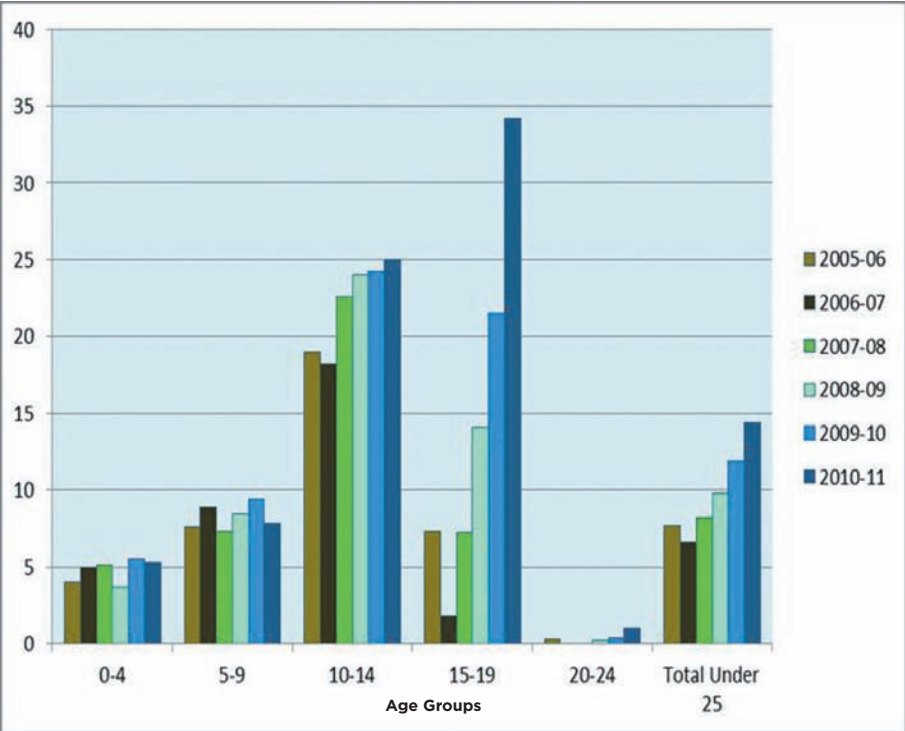
In 2010-11, in both England and Wales, patients aged between 15 years and 19 years had the highest incidence of DKA followed by those in the age bracket 10-14 years. Those under 10 years and over 20 years had relatively lower incidence rates. However rates for patients over 20 years of age are unreliable as most patients over 20 years have transitioned to adult services. In addition, female patients in all age groups (except those in the infant age group 0-4) had a higher incidence of DKA admissions than their male counterparts. In England in all age groups females have a higher incidence of DKA than males in almost all years under consideration whereas in Wales this pattern is less clear. In almost all of the age groups the incidence of DKA in England has increased over this timeframe.

In both countries persons in age groups 10-14 years and 15-19 years experienced a higher incidence of DKA than those under 10 years or over 20 years. In both England and Wales, all males and females under 25 years have experienced increasing DKA incidence rates from 2005-6 to 2010-11 with a slight fall in rates in 2006-07. All females under 25 years generally experienced lower rate of incidence of DKA in Wales than in England except in 2008-09 when Wales recorded a higher female incidence rate. On the other hand, all males under 25 years generally experienced lower rate of incidence of DKA in Wales than in England from 2005-06 to 2007-08 after which the incidence rates for males under 25 years declined in England compared to Wales. Figure 24 and Figure 25 show the breakdown of incidence rates of DKA admissions per 100,000 general population for males and females by country.

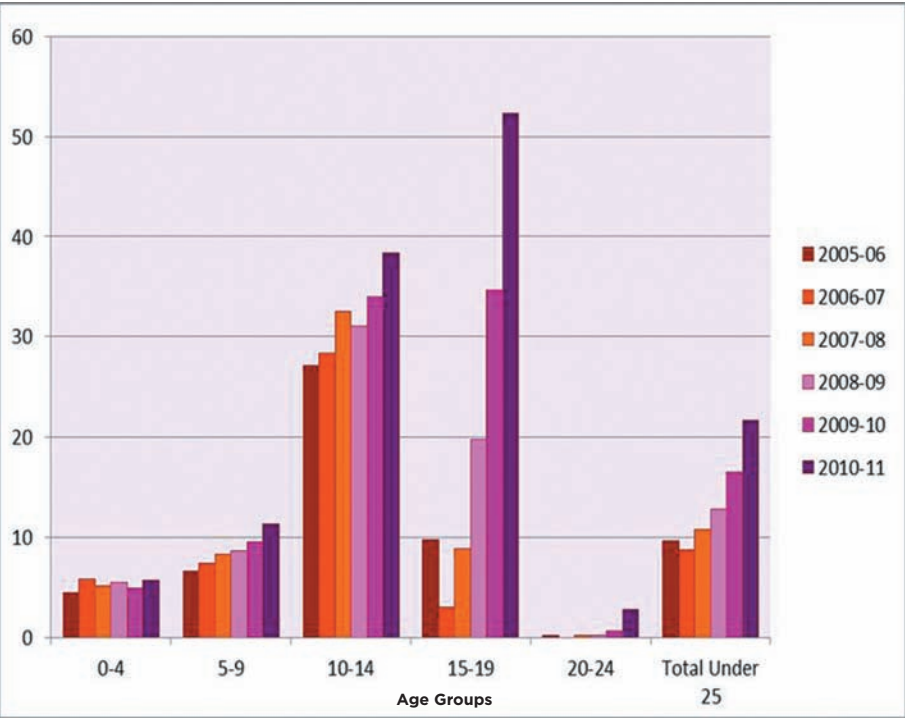
Table 13: Age/sex specific crude incidence rates of DKA admissions per 100,000 general population, England and Wales (2005-06 to 2010-11)

	Males												Females											
	England						Wales						England						Wales					
Year/ Age Groups	0-4	5-9	10-14	15-19	20-24	Total Under 25	0-4	5-9	10-14	15-19	20-24	Total Under 25	0-4	5-9	10-14	15-19	20-24	Total Under 25	0-4	5-9	10-14	15-19	20-24	Total Under 25
2010-11	5.3	7.8	25.0	34.2	1.0	14.4	15.7	7.2	17.7	34.2	0.0	15.0	5.7	11.3	38.4	52.3	2.8	21.7	0.0	10.2	23.3	41.5	0.0	15.2
2009-10	5.5	9.4	24.2	21.5	0.4	11.9	4.6	9.6	16.3	29.0	0.0	12.0	4.9	9.5	34.0	34.6	0.7	16.5	3.6	11.5	20.6	37.8	0.0	14.9
2008-09	3.7	8.4	24.0	14.1	0.2	9.8	3.5	9.5	23.5	17.3	0.0	10.8	5.5	8.6	31.1	19.8	0.2	12.8	2.4	5.1	42.6	23.4	0.0	14.9
2007-08	5.1	7.3	22.6	7.2	0.0	8.2	2.4	8.2	20.9	8.6	0.0	8.0	5.1	8.3	32.5	8.9	0.2	10.8	0.0	13.6	21.0	11.1	0.0	9.1
2006-07	5.0	8.9	18.2	1.8	0.0	6.6	2.4	8.0	18.6	1.0	0.0	6.0	5.8	7.4	28.4	3.0	0.0	8.8	6.4	2.4	15.2	1.0	0.0	4.9
2005-06	4.0	7.6	19.0	7.3	0.3	7.7	0.0	6.7	19.3	14.6	0.0	8.5	4.5	6.6	27.1	9.8	0.2	9.7	0.0	1.2	19.2	18.6	0.0	8.3

Figure 24: Age/sex specific crude incidence rates of DKA admissions per 100,000 general population males & females, England 2005-06 to 2010-11

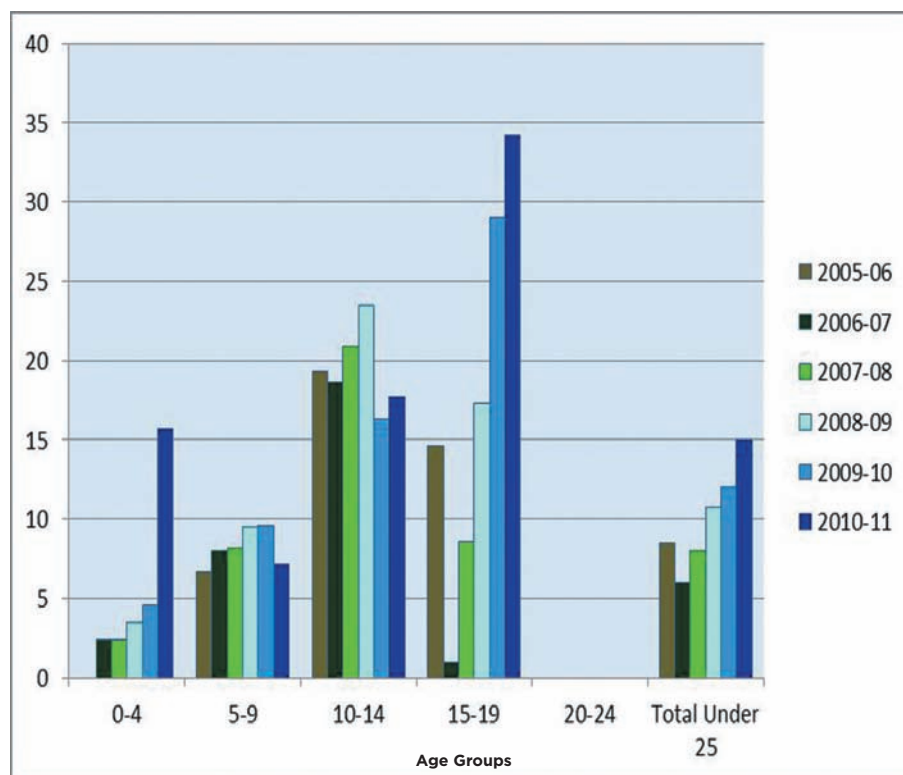


Males

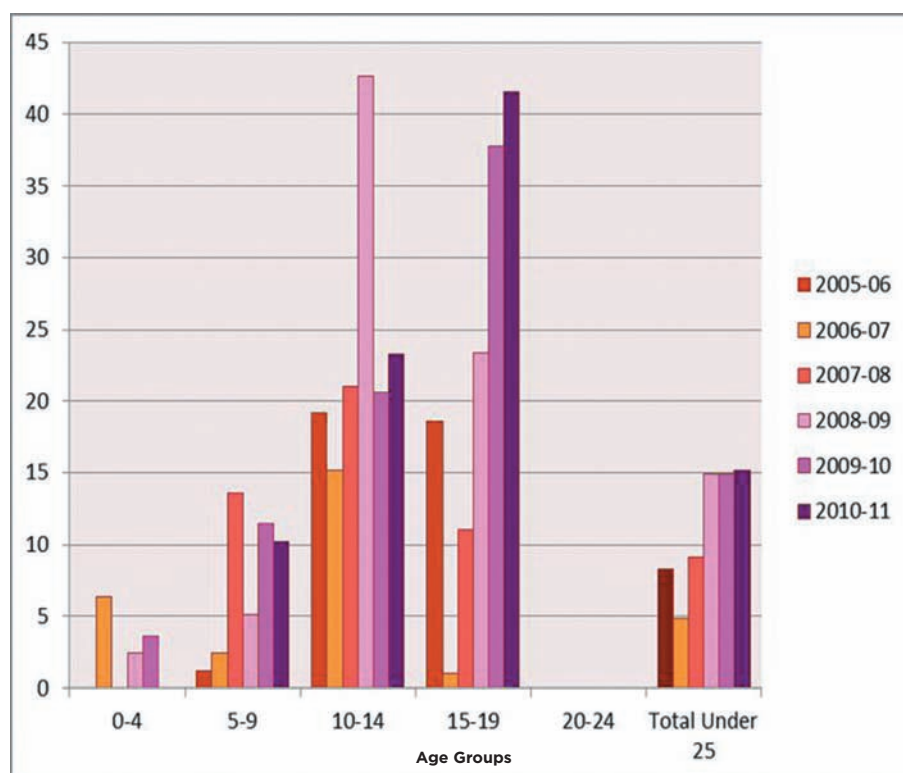


Females

Figure 25: Age/sex specific crude incidence rates of DKA admissions per 100,000 general population, males & females, Wales 2005-06 to 2010-11



Males



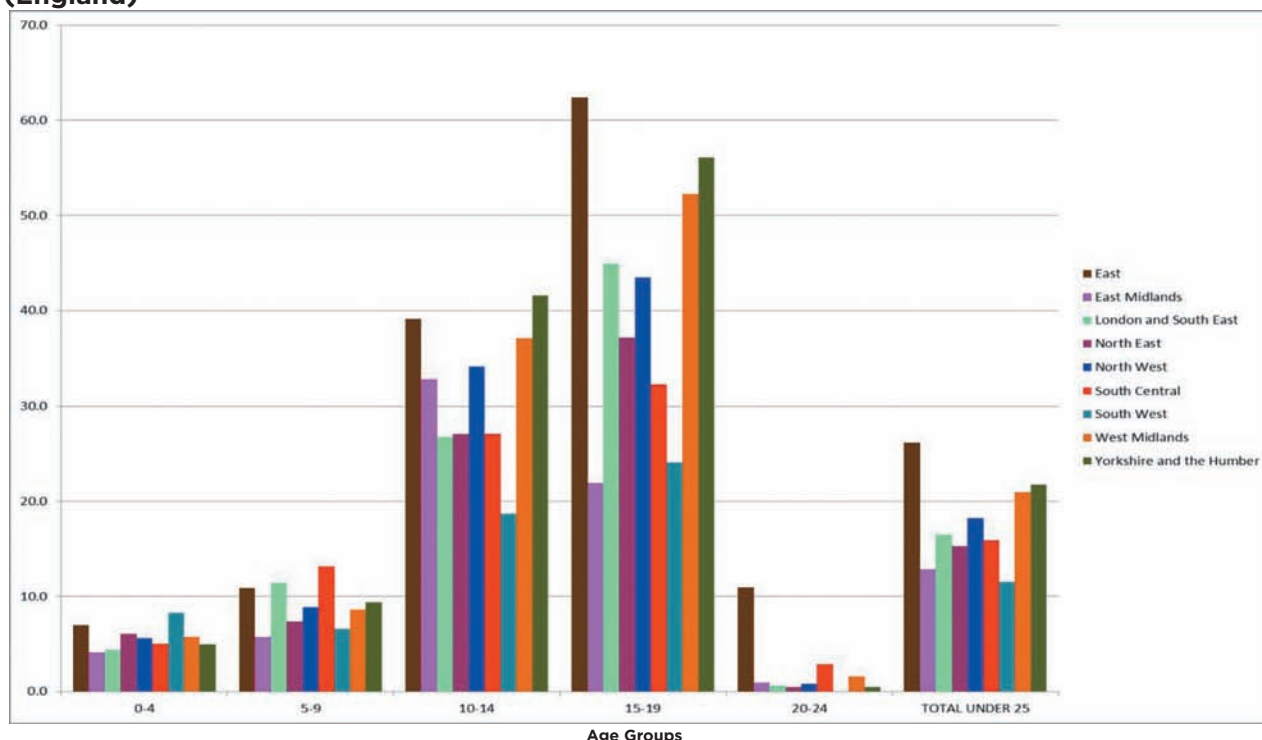
Females

Within England, the East of England and Yorkshire and the Humber regions had the highest incidence rate for DKA admissions (Table 14 and Figure 26). This is followed closely by the West Midlands and the North West Regions. The South West of England had by far the lowest DKA admission incidence in the country. This could be partly or wholly explained by differences in the age/sex structure of the populations (although the age-specific rates follow the same regional pattern), or differences in the populations, especially deprivation. As observed for England, those in the youngest and oldest age groups had the lowest incidence of DKA admissions, with highest rates in the 15-19 years age group, when most young people with Type 1 diabetes are taking over responsibility for their own treatment.

Table 14: Age-specific crude incidence rates of DKA admissions per 100,000 general population, English Regions 2010-11

	0-4	5-9	10-14	15-19	20-24	Total Under 25
East England	7.0	10.9	39.1	62.4	10.9	26.2
East Midlands	4.1	5.8	32.8	22.0	1.0	12.8
London and South East	4.4	11.4	26.8	44.9	0.6	16.5
North East	6.1	7.4	27.1	37.2	0.5	15.3
North West	5.6	8.9	34.1	43.5	0.8	18.2
South Central	5.0	13.2	27.1	32.3	2.9	15.9
South West	8.3	6.6	18.7	24.1	0.0	11.6
West Midlands	5.7	8.6	37.1	52.3	1.6	20.9
Yorkshire & Humber	5.0	9.4	41.6	56.1	0.5	21.7

Figure 26: Crude DKA incidence rates per 100,000 general population (by Region) in 2010-11 (England)



6.2.2 Reducing the Risk of Hospital Admission in Infants, Children and Young People with Diabetes

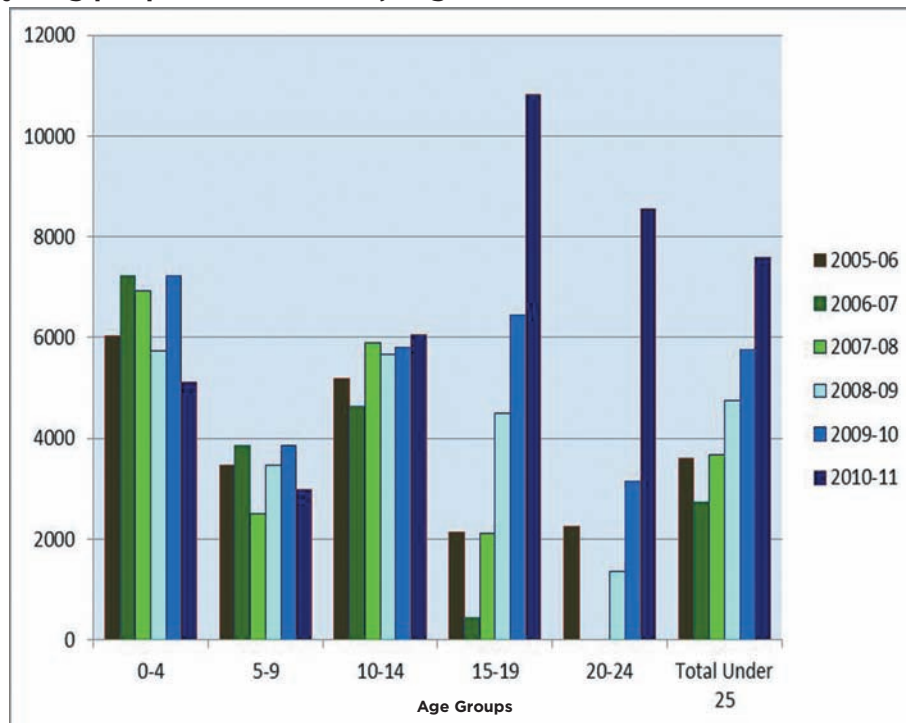
The following tables and charts use as the denominator the relevant prevalent population as the best way to answer the question: is the risk of admission with DKA in patients with diabetes reducing as a result of better care by Paediatric Diabetes Units?

Table 15 shows the incidence rates per 100,000 infants, children and young people with diabetes (prevalent population) for England and Wales from 2005-06 to 2010-11. Detailed tables for England and Wales showing the incidence numbers, rates and confidence intervals are given in Appendix C. In almost all age groups there is an upward trend in the incidence of DKA since 2005-06. Females with diabetes under 25 years had a comparatively higher incidence of DKA in both countries than males with diabetes under 25 years. Figure 27 and Figure 28 show the breakdown of incidence rates for DKA admissions per 100,000 infants, children and young people with diabetes for males and females by country.

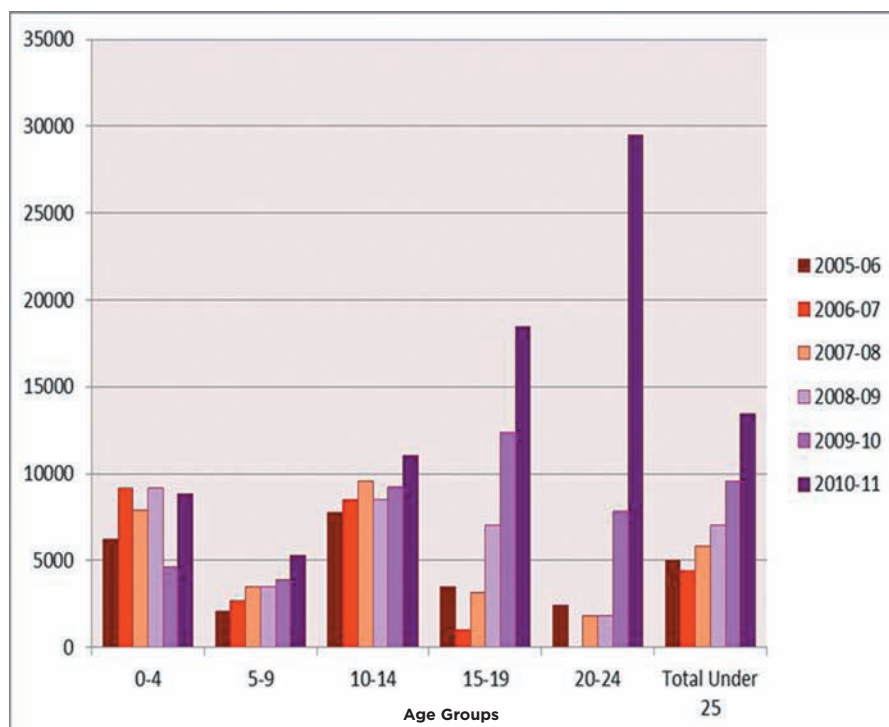
Table 15: Age/sex specific crude incidence rates of DKA admissions per 100,000 infants, children and young people with diabetes, England and Wales

	Males											
	England						Wales					
Year / Age Groups	0-4	5-9	10-14	15-19	20-24	Total Under 25	0-4	5-9	10-14	15-19	20-24	Total Under 25
2010-11	5120.5	2979.4	6042.9	10819.1	8558.6	7588.5	10344.8	1923.1	3921.6	9264.3	0.0	6464.4
2009-10	7228.9	3846.2	5809.6	6446.3	3153.2	5754.1	6896.6	7692.3	3137.3	7629.4	0.0	6068.6
2008-09	5722.9	3467.0	5669.6	4496.0	1351.4	4741.7	0.0	3846.2	5098.0	4359.7	0.0	4353.6
2007-08	6927.7	2491.9	5902.9	2114.6	0.0	3677.4	3448.3	3846.2	4313.7	2179.8	0.0	3166.2
2006-07	7228.9	3846.2	4643.0	431.1	0.0	2725.6	3448.3	4807.7	4705.9	272.5	0.0	2506.6
2005-06	6024.1	3467.0	5179.7	2135.1	2252.3	3590.9	0.0	2884.6	4313.7	2452.3	0.0	3034.3
	Females											
	England						Wales					
Year / Age Groups	0-4	5-9	10-14	15-19	20-24	Total Under 25	0-4	5-9	10-14	15-19	20-24	Total Under 25
2010-11	8852.5	5305.4	11041.3	18493.5	29518.1	13423.3	0.0	7142.9	5185.2	13043.5	0.0	8885.5
2009-10	4590.2	3886.5	9229.3	12383.4	7831.3	9535.1	10000	8333.3	4814.8	12040.1	0	8584.3
2008-09	9180.3	3516.3	8504.5	7042.9	1807.2	7053.9	0.0	2381.0	11481.5	7692.3	0	8433.7
2007-08	7868.9	3454.7	9591.7	3148.3	1807.2	5846.6	0.0	8333.3	4814.8	3010.0	0	4367.5
2006-07	9180.3	2714.4	8480.3	1002.8	0.0	4430.1	0.0	2381.0	2963.0	334.4	0.0	1656.6
2005-06	6229.5	2097.5	7731.3	3451.5	2409.6	4991.0	0.0	0	4444.4	5351.2	0	4216.9

Figure 27: Age/sex specific crude incidence rates of DKA admissions per 100,000 infants, children and young people with diabetes, England 2005-06 to 2010-11

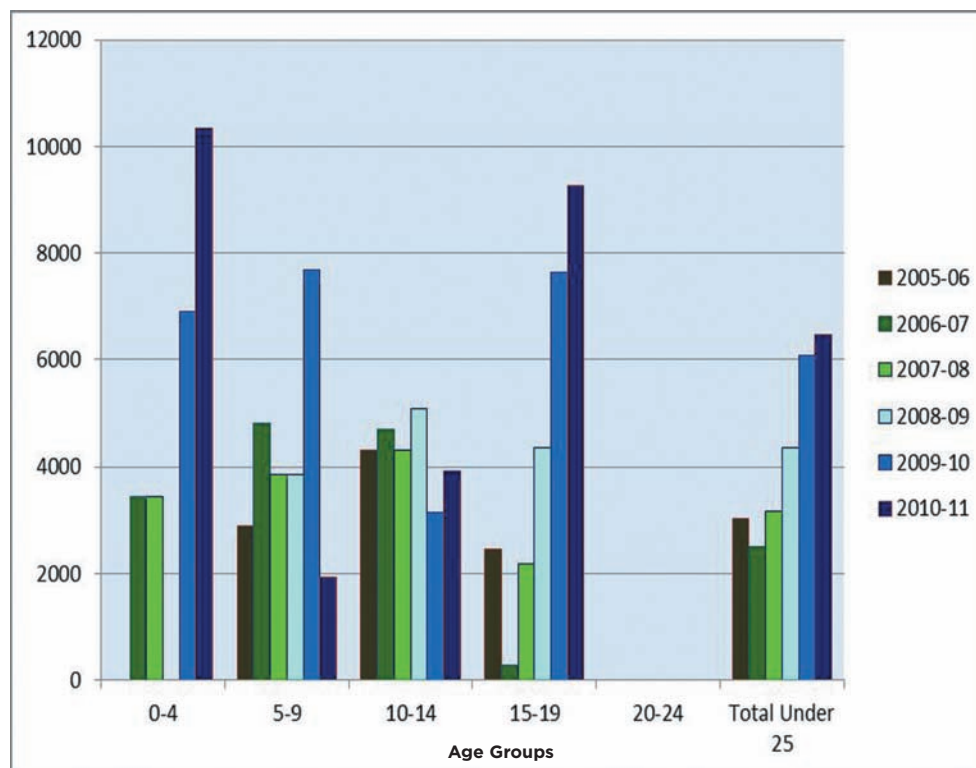


Males

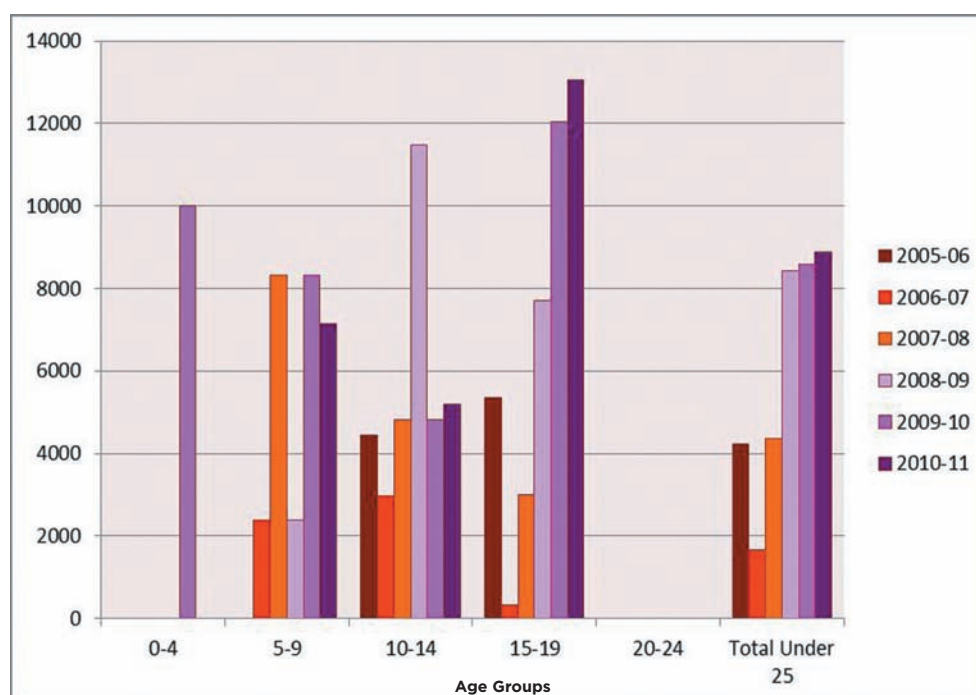


Females

Figure 28: Age/sex specific crude incidence rates of DKA admissions per 100,000 infants, children and young people with diabetes, Wales 2005-06 to 2010-11



Males



Females

7. Conclusions and future directions

The increased participation in the 2010-11 National Paediatric Diabetes Audit is an indicator that those delivering care to infants, children and young people with diabetes value the importance of the annual audit. There have been some improvements particularly in the recording of individual care processes albeit that the proportion of patients receiving all eight care processes remains very low. There has been little change across in England and Wales in HbA1c levels, but considerable variation exists between Paediatric Diabetes Units. The National Paediatric Diabetes Audit is aware of the development of 'peer review' in some regions in England. The 'peer review' process along with audit data should help towards identifying areas of good practice which could be utilised in all centres to drive up quality of care.

There is a worrying increase in the numbers of infants, children and young people with diabetes being admitted with diabetic ketoacidosis. Even when the admission rate is adjusted for the prevalent diabetes population there remains an increasing incidence. Further analysis is being undertaken by the NPDA using risk adjustment to tease out potential confounding factors that may account for the rising incidence. Paediatric Diabetes Units also need to address this at their own local level.

The development of the regional networks and the introduction of the Best Practice Tariff in England should help towards delivering a high quality service to infants, children and young people with diabetes and the National Paediatric Diabetes Audit will continue to monitor this process by mapping the recording of care processes and clinical outcomes.

Having recognised the challenges in front of the National Paediatric Diabetes Audit, there has been a number of steps undertaken in order to address them. Namely, a new more comprehensive dataset and a new webplatform have been developed for 2011-12 data collection. These allow for more meaningful and accurate data capture and should contribute towards maximising use of the audit results. There will also be a new Patient Reported Experience Measure Questionnaire (PREM) implemented across the country in 2012, the results of which will be linked to the NPDA care processes and outcomes.

The NPDA is looking forward to working with patients, clinicians and other stakeholders in England and Wales in order to improve outcomes for infants, children and young people with diabetes.

8. Acknowledgments and collaborators

National Paediatric Diabetes Audit Project Board

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The following societies and organisations have provided collaborative support to the National Paediatric Diabetes Audit:

National Paediatric Diabetes Audit Collaborators

- Association of Children's Diabetes Clinicians
- British Dietetic Association
- British Psychological Society
- British Society for Paediatric Endocrinology and Diabetes
- Diabetes UK
- Juvenile Diabetes Research Foundation
- NHS Diabetes
- Royal College of Nursing

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3. National Institute for Clinical Excellence. Clinical Guideline 15: Type 1 diabetes: Diagnosis and management of type 1 diabetes in children, young people and adults. In: Excellence NIfC, editor. London: National Institute for Clinical Excellence, 2004.
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10. Appendix A: Data on Paediatric Diabetes Units in the 2010-11 National Paediatric Diabetes Audit

PDU code	PDU name	% with missing HbA1c	% Missing all Key Care Processes (Except HbA1c)	% with HbA1c<7.5%	Mean HbA1c	Median HbA1c
PZ001	Singleton Hospital Abertawe Bro Morgannwg University Health Board Wales	12.6	33.3	15.8	8.7	8.4
PZ002	Norfolk & Norwich University Hospital Norfolk and Norwich University Hospital Trust E of England	2.1	39.6	13.2	9.0	8.6
PZ003	Pinderfields General Hospital The Mid Yorkshire Hospitals NHS Trust Y&H	4.4	56.1	16.1	9.0	9.0
PZ004	Northampton General Hospital Northampton General Hospital NHS Trust EM	4.2	60.9	16.9	8.8	8.6
PZ005	Derbyshire Children's Hospital Derby Hospitals NHS Foundation Trust EM	0.8	58.4	16.7	9.0	8.6
PZ006	Doncaster Royal Infirmary Doncaster & Bassetlaw Hospitals NHS Foundation Trust Y&H	1.5	30.5	20.0	9.0	8.7
PZ007	John Radcliffe Hospital Oxford Radcliffe Hospitals NHS Trust SC	0.0	41.2	31.9	8.2	8.0
PZ009	Macclesfield District General Hospital East Cheshire NHS Trust NW	1.2	35.7	10.0	9.1	8.9
PZ010	Luton and Dunstable Hospital Luton and Dunstable Hospital NHS Foundation Trust E of England	0.8	22.9	11.9	9.1	8.7
PZ011	Glan Clwyd District General Hospital Betsi Cadwaladr University Health Board Wales	6.8	100.0	18.3	8.8	8.5
PZ012	Barnet Hospital Barnet & Chase Farm Hospitals NHS Trust L&SE	12.0	70.4	11.1	9.3	8.9
PZ014	Chase Farm Hospital Barnet & Chase Farm Hospitals NHS Trust L&SE	8.3	74.1	18.2	9.2	8.9
PZ015	Wythenshawe Hospital University Hospital of South Manchester NHS foundation Trust NW	2.4	55.5	14.8	9.1	8.9
PZ016	Bassetlaw Hospital Doncaster & Bassetlaw Hospitals NHS Foundation Trust Y&H	0.0	39.8	13.1	8.9	8.8
PZ017	Dorset County Hospital Dorset County Hospital NHS Foundation Trust SC	1.1	26.7	20.2	8.4	8.1
PZ018	Worthing Hospital Western Sussex Hospitals NHS L&SE	1.7	36.4	15.0	9.0	8.6

PDU code	PDU name	% with missing HbA1c	% Missing all Key Care Processes (Except HbA1c)	% with HbA1c < 7.5%	Mean HbA1c	Median HbA1c
PZ019	Basildon Hospital Basildon and Thurrock University Hospitals NHS Foundation Trust E of England	4.3	63.9	10.2	9.6	9.4
PZ020	Diana Princess Of Wales Hospital Northern Lincolnshire and Goole Hospitals NHS Foundation	3.1	59.4	5.3	9.7	9.6
PZ021	Wexham Park Hospital Heatherwood and Wexham Park Hospitals NHS Foundation Trust SC	5.2	55.5	8.7	9.0	8.6
PZ022	West Cumberland Hospital North Cumbria University Hospitals NHS Trust NW	0.0	53.1	3.7	9.3	9.0
PZ023	St George's Hospital St George's Healthcare NHS Trust L&SE	100.0	100.0	All Missing	All Missing	All Missing
PZ024	East Kent Hospitals NHS Trust East Kent Hospitals University NHS Foundation Trust L&SE	0.3	26.2	14.3	9.1	9.0
PZ026	Hull Royal Infirmary Hull & East Yorkshire Hospitals NHS Trust Y&H	2.7	68.4	14.7	9.2	8.9
PZ027	Friarage Hospital South Tees Hospitals NHS Trust Y&H / NE	0.0	30.3	9.7	8.9	8.6
PZ028	Stoke Mandeville Hospital Buckinghamshire Hospitals NHS Trust SC	6.3	29.1	21.3	8.8	8.9
PZ029	Fairfield General Hospital The Pennine Acute Hospitals NHS Trust NW	6.3	54.5	6.7	9.5	9.7
PZ030	Leighton Hospital Mid Cheshire Hospitals NHS Trust NW	0.9	68.3	30.6	8.4	8.4
PZ031	St Richard's Hospital The Royal West Sussex NHS Trust L&SE	4.8	98.4	6.8	8.9	8.7
PZ032	Royal Victoria Infirmary, Newcastle-Upon-Tyne The Newcastle Upon Tyne Hospital Trust NE	1.9	39.2	17.5	8.9	8.6
PZ033	Queens Hospital, Burton Hospitals NHS Trust WM	0.0	35.9	14.5	8.9	8.6
PZ034	Royal Hampshire County Hospital Winchester & Eastleigh Healthcare NHS Trust SC	4.7	52.8	13.9	9.1	8.9
PZ035	Royal Berkshire Hospital Royal Berkshire NHS Foundation Trust SC	2.3	33.6	23.2	8.3	8.0
PZ036	Whipps Cross University Hospital NHS Trust Whipps Cross University NHS Trust L&SE	21.7	67.8	17.8	8.9	8.5
PZ038	Wycombe General Buckinghamshire Hospitals NHS Trust SC	2.4	30.7	9.4	9.4	9.2
PZ040	Birmingham Heartlands Hospital Heart of England NHS Foundation Trust WM	100.0	100.0	All Missing	All Missing	All Missing
PZ041	Addenbrooke's Hospital Cambridge University Hospitals NHS Foundation Trust E of England	18.4	55.8	12.3	9.2	8.8

PDU code	PDU name	% with missing HbA1c	% Missing all Key Care Processes (Except HbA1c)	% with HbA1c<7.5%	Mean HbA1c	Median HbA1c
PZ042	QMS Campus, Nottingham Nottingham University Hospitals NHS Trust EM	5.1	51.7	20.8	8.5	8.3
PZ044	Royal Oldham Hospital The Pennine Acute Hospitals NHS Trust NW	1.4	38.4	7.2	9.2	8.7
PZ045	Whittington Hospital Whittington Hospital NHS Trust L&SE	1.5	49.0	18.2	8.9	8.6
PZ047	Airedale General Hospital Airedale NHS Trust Y&H	0.0	36.0	15.9	9.0	8.9
PZ048	Lincoln County Hospital United Lincolnshire Hospitals NHS Trust EM	1.8	65.2	19.6	9.1	8.8
PZ049	Warrington General Hospital Warrington and Halton Hospitals NHS Foundation NW	0.0	55.0	19.7	8.5	8.5
PZ050	Queen Mary's Hospital for Children, Epsom & St Helier Trust Epsom & St Helier University	0.0	17.9	22.9	8.8	8.4
PZ052	Nevill Hall Hospital Aneurin Bevan Health Board Wales	6.6	37.0	18.8	9.0	8.8
PZ053	Scunthorpe General Hospital Northern Lincolnshire and Goole Hospitals NHS Foundation Trust	0.0	30.2	13.8	9.3	9.1
PZ054	Poole General Hospital Poole Hospital NHS Trust SC	0.0	41.2	20.3	8.4	8.3
PZ055	Leicester Royal Infirmary University Hospitals Leicester NHS Trust EM	0.4	45.0	15.5	8.8	8.7
PZ056	West Wales General Hospital Hywel Dda Health Board Wales	16.5	37.5	23.9	8.5	7.9
PZ057	Kingston Hospital Kingston Hospital NHS Trust L&SE	0.8	77.0	22.8	8.6	8.4
PZ058	Newham General Hospital Newham University Hospital NHS Trust L&SE	4.3	50.1	15.6	9.3	9.4
PZ059	The Royal London Hospital Barts and the London NHS Trust L&SE	10.7	44.2	21.5	8.8	8.4
PZ060	Royal Devon & Exeter Royal Devon and Exeter NHS Foundation Trust SW	0.7	100.0	8.0	9.2	8.9
PZ062	Croydon University Hospital Croydon Health Services NHS Trust L&SE	0.0	27.0	17.0	9.3	8.9
PZ064	Chesterfield Royal Hospital Chesterfield Royal Hospital NHS Foundation Trust EM	0.0	39.2	14.4	8.9	8.8
PZ065	Staffordshire General Hospital Mid Staffordshire NHS Foundation Trust WM	0.8	72.6	13.0	9.2	8.9
PZ067	Royal Cornwall Hospital Royal Cornwall Hospitals NHS Trust SW	0.5	100.0	10.1	9.2	8.9
PZ068	Royal United Bath Hospital Royal United Hospital Bath NHS Trust SW	4.0	47.9	12.6	8.9	8.7
PZ069	Stepping Hill Hospital, Stockport Stockport NHS Foundation Trust NW	7.3	63.3	21.0	8.7	8.5

PDU code	PDU name	% with missing HbA1c	% Missing all Key Care Processes (Except HbA1c)	% with HbA1c<7.5%	Mean HbA1c	Median HbA1c
PZ072	West Suffolk Hospital West Suffolk Hospital NHS Trust E of England	0.0	100.0	14.0	8.6	8.4
PZ073	Alexandra Hospital Worcestershire Acute Hospitals NHS Trust WM	0.0	41.6	8.3	9.7	9.5
PZ074	Alder Hey Hospital Alder Hey Children's NHS Foundation Trust NW	0.0	67.8	14.9	9.1	8.8
PZ075	St Mary's Hospital Isle of Wight Healthcare NHS Trust SC	0.0	61.6	18.6	9.0	8.9
PZ076	Colchester General Hospital Colchester Hospital University NHS Foundation Trust E of England	8.3	76.8	3.9	9.6	9.6
PZ078	North Staffordshire Hospital University Hospital of North Staffordshire NHS Trust WM	3.8	50.2	7.0	9.5	9.2
PZ080	Sunderland Royal Hospital City Hospitals Sunderland NHS Trust NE	0.6	43.1	13.1	9.0	8.9
PZ082	Evelina Children's Hospital at St Thomas Hospital, London Guy's and St Thomas' NHS	0.0	86.8	12.0	9.8	9.5
PZ084	Kidderminster General Hospital Worcestershire Acute Hospitals NHS Trust WM	7.4	76.1	18.0	8.9	8.7
PZ085	Princess Royal University Hospital South London Healthcare NHS Trust L&SE	20.3	70.4	11.1	8.5	8.3
PZ086	Hinchingbrooke Hospital Hinchingbrooke Health Care NHS Trust E of England30 Conquest Hospital	0.0	26.3	16.0	9.0	8.8
PZ090	Pontefract General Infirmary The Mid Yorkshire Hospitals NHS Trust Y&H	3.5	60.2	14.5	8.8	8.5
PZ091	East Lancashire Diabetic Service East Lancashire Hospitals NHS Trust NW	2.1	44.7	19.0	8.7	8.5
PZ092	Princess of Wales Hospital Abertawe Bro Morgannwg University Health Board Wales	0.0	40.1	10.7	9.1	8.9
PZ094	Princess Royal, Telford Royal Shrewsbury Hospitals NHS Trust WM	0.0	43.5	18.6	8.7	8.5
PZ096	Derriford Hospital Plymouth Hospitals NHS Trust SW	3.2	100.0	30.0	7.9	7.7
PZ097	City Hospital Birmingham Sandwell and West Birmingham Hospitals NHS Trust WM	7.5	25.7	16.1	8.9	8.7
PZ099	East & North Hertfordshire NHS Trust East and North Hertfordshire NHS Trust E of England	1.0	43.0	18.5	8.5	8.4
PZ100	North Devon District Hospital Northern Devon Healthcare NHS Trust SW	69.4	87.4	15.8	9.6	9.3

PDU code	PDU name	% with missing HbA1c	% Missing all Key Care Processes (Except HbA1c)	% with HbA1c<7.5%	Mean HbA1c	Median HbA1c
PZ101	Leeds Children's Hospital Leeds Teaching Hospitals NHS Trust Y&H	2.0	46.1	24.7	8.4	8.2
PZ102	Hillingdon Hospital Hillingdon Hospital NHS Trust L&SE	2.0	69.3	12.5	9.2	9.0
PZ104	Royal Albert Edward Infirmary Wroughtington, Wigan and Leigh NHS Foundation Trust NW	2.4	20.4	12.1	9.2	8.8
PZ105	St Luke's Hospital Bradford Teaching Hospitals NHS Trust Y&H	4.4	56.5	10.9	9.3	9.1
PZ106	Victoria Hospital, Blackpool Blackpool, Fylde and Wyre Hospitals NHS Trust NW	0.0	72.9	21.6	8.6	8.4
PZ107	Queen Elizabeth Hospital, Gateshead Gateshead Health NHS Foundation Trust NE	2.4	42.9	13.6	9.2	9.0
PZ108	Birmingham Children's Hospital Birmingham Children's Hospital NHS Foundation Trust WM	7.0	64.2	21.4	8.9	8.4
PZ109	Southampton General Hospital Southampton University Hospitals NHS Trust SC	1.4	33.7	15.6	8.7	8.4
PZ110	Ormskirk District General Hospital Southport and Ormskirk NHS Trust NW	10.5	48.3	Missing and/or invalid	Missing and/or invalid	Missing and/or invalid
PZ111	Hereford County Hospital Wye Valley NHS Trust WM	2.9	38.3	Missing and/or invalid	Missing and/or invalid	Missing and/or invalid
PZ112	Scarborough General Hospital Scarborough and North East Yorkshire Healthcare NHS Trust Y&H	2.5	71.4	15.6	8.4	8.2
PZ113	University Hospital of Wales Cardiff and Vale University Health Board Wales	5.9	34.7	13.9	9.2	8.9
PZ114	York District Hospital York Teaching Hospital NHS Foundation Trust Y&H	2.1	53.9	20.9	8.8	8.5
PZ118	University Hospital Lewisham Lewisham Healthcare NHS Trust L&SE	4.6	26.4	19.3	9.2	8.6
PZ119	Darent Valley Hospital Dartford and Gravesham NHS Trust L&SE	1.0	42.9	10.4	8.9	8.9
PZ120	North Tyneside General Hospital, North Shields Northumbria Healthcare NHS Foundation Trust NE	11.2	100.0	13.8	8.9	8.8
PZ121	George Eliot Hospital George Eliot Hospital NHS Trust WM	1.1	23.9	13.5	8.9	8.7
PZ122	University Hospital Coventry University Hospitals Coventry and Warwickshire NHS Foundation	79.7	100.0	13.3	9.2	9.3

PDU code	PDU name	% with missing HbA1c	% Missing all Key Care Processes (Except HbA1c)	% with HbA1c<7.5%	Mean HbA1c	Median HbA1c
PZ125	Maidstone Hospital Maidstone and Tunbridge Wells Area and NHS Trust L&SE	0.0	64.1	26.8	8.1	8.0
PZ126	Medway Maritime Hospital Medway NHS Foundation Trust L&SE	2.4	65.9	12.0	9.0	8.7
PZ127	James Paget Hospital James Paget University Hospitals NHS Foundation Trust E of England	3.2	44.7	10.0	9.4	8.9
PZ128	Pilgrim Hospital, Boston United Lincolnshire Hospitals NHS Trust EM	16.4	67.7	23.0	8.3	8.3
PZ129	Harrogate General Hospital Harrogate and District NHS Foundation Trust Y&H	3.8	78.6	10.0	9.2	8.8
PZ131	Peterborough General Peterborough and Stamford Hospitals NHS Trust E of England	1.9	48.3	11.0	9.3	9.0
PZ132	Ysbyty Gwynedd Hospital Betsi Cadwaladr University Health Board Wales	14.5	66.7	23.1	8.4	8.2
PZ133	James Cook University Hospital South Tees Hospitals NHS Trust NE	0.8	54.9	16.3	8.8	8.5
PZ134	Trafford General Hospital Trafford Healthcare NHS Trust NW	0.0	20.3	8.7	9.0	9.0
PZ135	Royal Alexandra Hospital, Brighton Brighton and Sussex University Hospitals NHS Trust L&SE	3.7	44.3	5.1	8.8	8.6
PZ136	Royal Manchester Children's Hospital Central Manchester University Hospitals NHS Foundation	3.4	70.6	20.5	8.7	8.5
PZ137	Musgrove Park Hospital Taunton and Somerset NHS Foundation Trust SW	3.0	41.7	16.5	9.2	9.2
PZ138	Warwick Hospital South Warwickshire NHS Foundation Trust WM	9.6	100.0	5.7	9.8	9.3
PZ139	Bristol Royal Hospital for Children University Hospitals Bristol NHS Foundation Trust SW	5.5	55.4	24.7	8.5	8.3
PZ140	Tameside General Tameside Hospital NHS Foundation Trust NW	0.0	100.0	1.4	9.7	9.2
PZ141	South Tyneside District Hospital South Tyneside NHS Foundation Trust NE	2.0	38.5	8.0	9.0	8.6
PZ143	King George Hospital Barking, Havering & Redbridge University Hospitals NHS Trust L&SE	3.8	89.8	11.7	9.2	9.1
PZ144	Good Hope Hospital Heart of England NHS Foundation Trust WM	100.0	100.0	All Missing	All Missing	All Missing
PZ145	Milton Keynes Hospital Milton Keynes Hospital NHS Foundation Trust SC	All Invalid Birth Years	All Invalid Birth Years	All Invalid Birth Years	All Invalid Birth Years	All Invalid Birth Years

PDU code	PDU name	% with missing HbA1c	% Missing all Key Care Processes (Except HbA1c)	% with HbA1c<7.5%	Mean HbA1c	Median HbA1c
PZ146	Southend General Hospital Southend University Hospital NHS Foundation Trust E of England	0.8	51.3	13.6	9.1	8.9
PZ149	Barnsley District General Hospital Barnsley Hospital NHS Foundation Trust Y&H	0.0	31.8	16.8	8.8	8.7
PZ150	Cumberland Infirmary North Cumbria University Hospitals NHS Trust NW	2.1	74.8	14.7	8.9	8.6
PZ151	Queen Elizabeth Hospital, Woolwich South London Healthcare NHS Trust L&SE	0.9	60.7	7.6	9.6	9.1
PZ152	Torbay Hospital, Torquay South Devon Healthcare NHS Trust SW	3.5	37.1	10.9	9.5	9.3
PZ153	Whiston Hospital St Helens and Knowsley Teaching Hospitals NHS Trust NW	0.0	47.0	17.8	8.7	8.5
PZ156	Queen Elizabeth, Kings Lynn Queen Elizabeth Hospitals NHS Trust E of England	0.7	15.5	8.0	9.4	9.2
PZ157	Royal Free & University College Hospital, London Royal Free Hampstead NHS Trust L&SE	1.9	25.9	11.5	9.2	8.7
PZ158	Epsom General Hospital Epsom & St Helier University Hospitals NHS Trust L&SE	100.0	100.0	All Missing	All Missing	All Missing
PZ159	North Hampshire Hospitals Basingstoke and North Hampshire NHS Foundation Trust SC	0.7	48.0	15.6	8.8	8.7
PZ160	Bishop Auckland General Hospital County Durham and Darlington NHS Foundation Trust NE	8.7	69.4	9.5	9.3	9.2
PZ161	Darlington Memorial Hospital County Durham and Darlington NHS Foundation Trust NE	1.4	65.3	2.9	10.3	10.1
PZ162	University Hospital North Durham County Durham and Darlington NHS Foundation Trust NE	3.7	80.4	10.5	9.1	8.9
PZ163	North Tees General Hospital North Tees and Hartlepool NHS Trust NE	2.3	47.0	10.9	8.9	8.8
PZ164	Rotherham General Hospital The Rotherham NHS Foundation Trust Y&H	7.0	17.7	13.1	9.3	8.8
PZ166	Calderdale Royal Hospital, Halifax Calderdale & Huddersfield NHS Foundation Trust Y&H	5.4	17.9	28.4	8.4	8.3
PZ167	University Hospitals of Morecambe Bay NHS Foundation Trust University Hospitals of Morecambe	0.7	23.3	6.6	9.2	9.0
PZ168	Grantham and District Hospital United Lincolnshire Hospitals NHS Trust EM	0.0	72.9	28.6	8.2	8.2

PDU code	PDU name	% with missing HbA1c	% Missing all Key Care Processes (Except HbA1c)	% with HbA1c<7.5%	Mean HbA1c	Median HbA1c
PZ169	Salisbury District Hospital Salisbury NHS Foundation Trust SC	2.4	73.0	16.0	9.0	8.7
PZ170	Arrowe Park Hospital Wirral University Teaching Hospital NHS Foundation Trust NW	90.2	98.5	0.0	9.2	8.9
PZ171	Broomfield Hospital, Chelmsford Mid Essex Hospital Services NHS Trust E of England	0.0	71.7	16.2	8.7	8.5
PZ172	Watford General Hospital West Hertfordshire Hospitals NHS Trust / Hertfordshire Community NHS	5.3	20.7	4.4	9.2	8.9
PZ173	Yeovil District Hospital Yeovil District Hospital NHS Foundation Trust SW	0.0	7.7	10.4	9.2	8.9
PZ174	Kettering General Hospital Kettering General Hospital NHS Trust EM	0.9	53.5	20.7	8.7	8.6
PZ175	Queen Mary's Hospital, Sidcup South London Healthcare NHS Trust L&SE	0.0	37.3	20.5	8.3	8.3
PZ176	St Peter's Hospital Ashford and St Peter's Hospitals NHS Trust L&SE	0.0	54.8	13.0	8.6	8.5
PZ177	Royal Bolton Hospital Bolton PCT NW	0.0	32.8	9.6	9.0	8.7
PZ178	Manor Hospital Walsall Healthcare NHS Trust WM	5.1	58.4	17.0	8.8	8.6
PZ179	Countess of Chester Hospital NHS Foundation Trust Countess Of Chester Hospital NHS Foundation	0.0	38.3	29.4	8.5	8.2
PZ180	King's Mill Hospital Sherwood Forest Hospitals NHS Foundation Trust EM	0.8	17.5	16.4	8.4	8.3
PZ181	Ipswich Hospital The Ipswich Hospital NHS Trust E of England	0.0	100.0	16.1	9.2	8.8
PZ182	West Middlesex University Hospital West Middlesex University Hospital NHS Trust L&SE	4.9	32.6	13.4	9.3	9.1
PZ183	Royal Preston Hospital Lancashire Teaching Hospitals NHS Foundation Trust NW	0.0	100.0	15.0	8.9	8.6
PZ184	Eastbourne District General Hospital East Sussex NHS Trust L&SE	10.3	49.3	25.7	8.8	8.8
PZ185	Bronglais General Hospital Hywel Dda Health Board Wales	11.4	32.9	12.8	9.5	9.3
PZ186	Huddersfield Royal Infirmary Calderdale & Huddersfield NHS Foundation Trust Y&H	0.0	12.7	16.9	9.3	8.8
PZ187	Wrexham Maelor Hospital Betsi Cadwaladr University Health Board Wales	2.4	12.8	22.5	8.2	8.1
PZ188	Royal Gwent Hospital Aneurin Bevan Health Board Wales	1.0	49.4	16.5	9.1	8.9

PDU code	PDU name	% with missing HbA1c	% Missing all Key Care Processes (Except HbA1c)	% with HbA1c<7.5%	Mean HbA1c	Median HbA1c
PZ189	Royal Glamorgan Hospital Cwm Taf Health Board Wales	15.6	20.0	18.4	8.6	8.4
PZ190	Withybush General Hospital Hywel Dda Health Board Wales	5.8	25.9	12.2	8.9	8.6
PZ191	Ealing Hospital Ealing Hospital NHS Trust L&SE	0.0	50.4	10.9	10.0	10.0
PZ193	Neath Port Talbot Hospital Abertawe Bro Morgannwg University Health Board Wales	17.5	100.0	15.4	8.8	8.8
PZ195	Central Middlesex Hospital North West London Hospitals NHS Trust L&SE	5.9	77.4	10.4	10.3	10.4
PZ199	North Middlesex University North Middlesex University Hospital NHS Trust L&SE	1.2	44.6	9.6	9.0	8.7
PZ200	Princess Alexandra, Harlow The Princess Alexandra Hospital NHS Trust E of England	3.6	49.0	3.8	9.8	9.3
PZ202	St Marys Hospital, London Imperial College Healthcare NHS Trust L&SE	0.0	22.1	24.3	8.7	8.4
PZ203	University College Hospital, London University College London Hospitals NHS Foundation Trust	6.1	100.0	33.8	8.0	7.7
PZ206	Rochdale Infirmary The Pennine Acute Hospitals NHS Trust NW	13.7	65.6	15.9	8.7	8.2
PZ213	East Surrey Hospital Surrey and Sussex NHS Trust L&SE	1.7	46.0	9.7	8.9	8.8
PZ215	King's College Hospital King's College Hospital NHS Trust L&SE	0.7	44.0	14.7	9.6	9.2
PZ218	Frimley Park Hospital Frimley Park Hospital NHS Trust L&SE	5.3	100.0	33.3	7.7	7.6
PZ219	Sheffield Children's Hospital Sheffield Children's NHS Foundation Trust Y&H	0.0	67.3	18.5	8.6	8.4
PZ220	Bedford Hospital Bedford Hospital NHS Trust E of England	1.2	100.0	15.0	9.0	9.0
PZ221	The Great Western Hospital, Swindon Great Western Hospitals NHS Foundation Trust SW	100.0	100.0	All Missing	All Missing	All Missing
PZ222	New Cross Hospital The Royal Wolverhampton Hospitals NHS Trust WM	3.3	39.7	13.5	9.4	9.1
PZ223	Sandwell General Hospital Sandwell and West Birmingham Hospitals NHS Trust WM	0.0	21.9	15.9	8.7	8.4
PZ225	Worcestershire Royal Hospital Worcestershire Acute Hospitals NHS Trust WM	0.0	38.5	13.1	9.4	9.0

PDU code	PDU name	% with missing HbA1c	% Missing all Key Care Processes (Except HbA1c)	% with HbA1c < 7.5%	Mean HbA1c	Median HbA1c
PZ226	Dewsbury and District Hospital The Mid Yorkshire Hospitals NHS Trust Y&H	3.9	50.3	8.2	9.2	9.0
PZ228	Prince Charles Hospital Cwm Taf Health Board Wales	3.9	7.7	27.4	8.1	8.0
PZ230	Conquest Hospital East Sussex NHS Trust L&SE	All Invalid Birth Years	All Invalid Birth Years	All Invalid Birth Years	All Invalid Birth Years	All Invalid Birth Years
PZ231	Salford Royal Hospital Salford Royal NHS Foundation Trust NW	0.0	49.2	21.8	8.5	8.4
PZ232	Queens Hospital, Romford Barking, Havering & Redbridge University Hospitals NHS Trust L&SE	9.2	58.3	9.6	9.6	9.5
PZ234	North Manchester General Hospital The Pennine Acute Hospitals NHS Trust NW	5.6	63.3	29.4	8.2	8.4
PZ240	Russells Hall Hospital The Dudley Group of Hospitals NHS Foundation Trust WM	10.6	75.8	11.1	9.1	8.8
PZ242	Cheltenham and Gloucester Hospital Gloucestershire Hospitals NHS Trust SW	7.9	71.6	13.9	8.7	8.6

*The following Paediatric diabetes Units submitted their data through other units:

PZ013	Furness General Hospital (submitted via PZ167) University Hospitals of Morecambe Bay NHS Foundation Trust
PZ043	St Mary's Hospital for Women and Children (submitted via PZ136) Central Manchester University Hospitals NHS Foundation Trust NW
PZ046	Horton Hospital (submitted via PZ007) Oxford Radcliffe Hospitals NHS Trust SC
PZ066	King Edward VII Hospital (submitted via PZ021) Heatherwood and Wexham Park Hospitals NHS Foundation
PZ095	Royal Shrewsbury Hospital (submitted via PZ094) The Shrewsbury and Telford Hospital NHS Trust WM
PZ116	Nottingham University Hospital (submitted via PZ042) Nottingham University Hospitals NHS Trust EM
PZ123	Ryegate Children's Centre (submitted via PZ219) Sheffield Children's NHS Foundation Trust Y&H
PZ155	St James University Hospital (submitted via PZ101) Leeds Teaching Hospitals NHS Trust Y&H
PZ208	Westmoreland General Hospital (submitted via PZ167) University Hospitals of Morecambe Bay NHS Foundation
PZ210	University Hospital of Hartlepool (submitted via PZ163) North Tees and Hartlepool NHS Trust NE

11. Appendix B:

11.1 Age/sex specific numbers and crude rates per 100,000 persons (95% confidence intervals) of DKA admissions, England (2005-06 to 2010-11)

	0-4	5-9	10-14	15-19	20-24	Total Under 25
2010-11						
Males	88	116	381	576	19	1180
	5.3 [4.3 - 6.5]	7.8 [6.5 - 9.4]	25.0 [22.6 - 27.6]	34.2 [31.6 - 37.2]	1.0 [0.7 - 1.6]	14.4 [13.6 - 15.2]
Females	91	161	560	829	49	1690
	5.7 [4.7 - 7]	11.3 [9.7 - 13.2]	38.4 [35.4 - 41.8]	52.3 [48.9 - 56]	2.8 [2.1 - 3.7]	21.7 [20.6 - 22.7]
Total	179	277	941	1405	68	2870
	5.5 [4.7 - 6.3]	9.5 [8.5 - 10.7]	31.6 [29.6 - 33.6]	43.0 [40.8 - 45.3]	1.9 [1.5 - 2.4]	17.9 [17.3 - 18.6]
2009-10						
Males	90	137	373	365	7	972
	5.5 [4.5 - 6.8]	9.4 [7.9 - 11.1]	24.2 [21.8 - 26.7]	21.5 [19.4 - 23.8]	0.4 [0.2 - 0.8]	11.9 [11.2 - 12.7]
Females	76	133	501	557	13	1280
	4.9 [3.9 - 6.1]	9.5 [8 - 11.3]	34.0 [31.2 - 37.1]	34.6 [31.8 - 37.6]	0.7 [0.4 - 1.3]	16.5 [15.6 - 17.4]
Total	167	272	877	926	25	2252
	5.2 [4.5 - 6.1]	9.5 [8.4 - 10.7]	29.1 [27.2 - 31.1]	28.0 [26.2 - 29.8]	0.7 [0.5 - 1]	14.1 [13.6 - 14.7]
2008-09						
Males	59	122	376	242	3	802
	3.7 [2.9 - 4.8]	8.4 [7 - 10]	24.0 [21.7 - 26.6]	14.1 [12.5 - 16]	0.2 [0.1 - 0.5]	9.8 [9.2 - 10.5]
Females	84	119	463	320	3	989
	5.5 [4.4 - 6.8]	8.6 [7.1 - 10.2]	31.1 [28.3 - 34]	19.8 [17.7 - 22]	0.2 [0.1 - 0.5]	12.8 [12 - 13.6]
Total	143	241	839	562	6	1791
	4.6 [3.9 - 5.4]	8.5 [7.5 - 9.6]	27.5 [25.7 - 29.4]	16.9 [15.5 - 18.3]	0.2 [0.1 - 0.4]	11.3 [10.8 - 11.8]
2007-08						
Males	80	107	358	124	0	669
	5.1 [4.1 - 6.4]	7.3 [6 - 8.8]	22.6 [20.4 - 25.1]	7.2 [6 - 8.6]	0.0	8.2 [7.6 - 8.9]
Females	76	116	490	145	3	830
	5.1 [4.1 - 6.4]	8.3 [6.9 - 9.9]	32.5 [29.8 - 35.5]	8.9 [7.6 - 10.5]	0.2 [0.1 - 0.6]	10.8 [10.1 - 11.5]
Total	156	223	848	269	3	1499
	5.1 [4.4 - 6]	7.8 [6.8 - 8.9]	27.4 [25.7 - 29.4]	8.0 [7.1 - 9]	0.1 [0 - 0.3]	9.5 [9 - 10]
2006-07						
Males	75	133	293	31	0	532
	5.0 [4 - 6.2]	8.9 [7.5 - 10.6]	18.2 [16.3 - 20.5]	1.8 [1.3 - 2.6]	0.0	6.6 [6.1 - 7.2]
Females	84	105	433	49	0	671
	5.8 [4.7 - 7.2]	7.4 [6.1 - 8.9]	28.4 [25.9 - 31.2]	3.0 [2.3 - 4]	0.0	8.8 [8.1 - 9.4]
Total	159	238	726	80	0	1203
	5.4 [4.6 - 6.3]	8.2 [7.2 - 9.3]	23.2 [21.6 - 25]	2.4 [1.9 - 3]	0.0	7.7 [7.2 - 8.1]
2005-06						
Males	59	115	311	124	5	614
	4.0 [3.1 - 5.1]	7.6 [6.3 - 9.1]	19.0 [17 - 21.2]	7.3 [6.1 - 8.7]	0.3 [0.1 - 0.7]	7.7 [7.1 - 8.3]
Females	63	96	419	158	4	740
	4.5 [3.5 - 5.7]	6.6 [5.4 - 8.1]	27.1 [24.6 - 29.8]	9.8 [8.4 - 11.5]	0.2 [0.1 - 0.7]	9.7 [9 - 10.4]
Total	122	211	730	282	9	1354
	4.2 [3.5 - 5]	7.1 [6.2 - 8.1]	22.9 [21.3 - 24.7]	8.6 [7.6 - 9.6]	0.3 [0.1 - 0.5]	8.7 [8.2 - 9.1]

11.2 Age/sex specific numbers and crude rates per 100,000 persons (95% Confidence Intervals) of DKA admissions, Wales (2005-06 to 2010-11)

	0-4	5-9	10-14	15-19	20-24	Total Under 25
2010-11						
Males	14	6	16	35	0	71
	15.7 [9.3 - 26.6]	7.2 [3.3 - 16.1]	17.7 [10.8 - 28.8]	34.2 [24.6 - 47.7]	0.0 [0-0]	15.0 [11.9 - 18.9]
Females	0	8	88	40	0	136
	0.0	10.2 [5.1 - 20.4]	23.3 [15.0-36.1]	41.5 [30.4 - 56.6]	0.0	15.2 [12.0-19.2]
Total	14	14	104	75	0	207
	8.1 [4.8 - 13.6]	8.7 [5.1 - 14.7]	20.4 [14.7 - 28.3]	37.8 [30.1 - 47.4]	0.0	15.1 [12.8 - 17.8]
2009-10						
Males	4	8	15	30	0	57
	4.6 [1.7 - 12.2]	9.6 [4.8 - 19.3]	16.3 [9.8 - 27]	29.0 [20.3 - 41.5]	0.0 [0-0]	12.0 [9.3 - 15.6]
Females	3	9	18	37	0	67
	3.6 [1.2 - 11.2]	11.5 [6 - 22.1]	20.6 [13 - 32.7]	37.8 [27.4 - 52.2]	0.0 [0-0]	14.9 [11.7 - 18.9]
Total	7	17	33	67	0	124
	4.1 [2 - 8.6]	10.5 [6.5 - 16.9]	18.4 [13 - 25.8]	33.3 [26.2 - 42.3]	0.0	13.4 [11.3 - 16]
2008-09						
Males	3	8	22	18	0	51
	3.5 [1.1 - 10.8]	9.5 [4.8 - 19.1]	23.5 [15.4 - 35.6]	17.3 [10.9 - 27.4]	0.0	10.8 [8.2 - 14.2]
Females	2	4	38	23	0	67
	2.4 [0.6 - 9.8]	5.1 [1.9 - 13.5]	42.6 [31 - 58.6]	23.4 [15.5 - 35.1]	0.0	14.9 [11.7 - 18.9]
Total	5	12	60	41	0	118
	3.0 [1.2 - 7.1]	7.4 [4.2 - 13]	32.8 [25.5 - 42.3]	20.2 [14.9 - 27.5]	0.0	12.8 [10.7 - 15.3]
2007-08						
Males	2	7	20	9	0	38
	2.4 [0.6 - 9.5]	8.2 [3.9 - 17.2]	20.9 [13.5 - 32.5]	8.6 [4.5 - 16.5]	0.0	8.0 [5.8 - 11]
Females	0	11	19	11	0	41
	0.0 []	13.6 [7.5 - 24.5]	21.0 [13.4 - 32.9]	11.1 [6.2 - 20.1]	0.0	9.1 [6.7 - 12.4]
Total	2	18	39	20	0	79
	1.2 [0.3 - 4.9]	10.8 [6.8 - 17.2]	21.0 [15.3 - 28.7]	9.8 [6.3 - 15.2]	0.0	8.6 [6.9 - 10.7]
2006-07						
Males	2	7	18	1	0	28
	2.4 [0.6 - 9.7]	8.0 [3.8 - 16.7]	18.6 [11.7 - 29.5]	1.0 [0.1 - 6.8]	0.0	6.0 [4.1 - 8.6]
Females	5	2	14	1	0	22
	6.4 [2.7 - 15.4]	2.4 [0.6 - 9.6]	15.2 [9 - 25.7]	1.0 [0.1 - 7.3]	0.0	4.9 [3.2 - 7.5]
Total	7	9	32	2	0	50
	4.4 [2.1 - 9.2]	5.2 [2.7 - 10.1]	16.9 [12 - 24]	1.0 [0.2 - 4]	0.0	5.5 [4.1 - 7.2]
2005-06						
Males	0	6	19	15	0	40
	0	6.7 [3 - 14.9]	19.3 [12.3 - 30.2]	14.6 [8.8 - 24.2]	0.0	8.5 [6.3 - 11.6]
Females	0	1	18	18	0	37
	0	1.2 [0.2 - 8.3]	19.2 [12.1 - 30.5]	18.6 [11.7 - 29.5]	0.0	8.3 [6 - 11.5]
Total	0	7	37	33	0	77
	0	4.0 [1.9 - 8.4]	19.2 [13.9 - 26.5]	16.5 [11.7 - 23.2]	0.0	8.4 [6.7 - 10.5]

12. Appendix C:

12.1 Age/sex specific numbers and crude rates per 100,000 infants, children and young people with diabetes (95% Confidence Intervals) of DKA admissions using diabetes prevalent population, England (2005-06 to 2010-11)

	0-4	5-9	10-14	15-19	20-24	Total Under 25
2010-11						
Males	17	55	259	527	19	877
	5120.5 [3183.2-8236.9]	2979.4 [2287.5-3880.7]	6042.9 [5350.0-6825.6]	10819.1 [9933.7-11783.4]	8558.6 [5459.1-13417.9]	7588.5 [7102.5-8107.7]
Females	27	86	457	793	49	1412
	8852.5 [6070.8-12908.6]	5305.4 [4294.6-6554.0]	11041.3 [10074.0-12101.5]	18493.5 [17250.1-19826.5]	29518.1 [22309.3-39056.2]	13423.3 [12741.1-14142.1]
Total	44	141	716	1320	68	2289
	6907.4 [5140.3-9281.9]	4066.9 [3448.1-4796.8]	8498.5 [7898.3-9144.4]	14412.1 [13655.2-15210.9]	17525.8 [13818.2-22228.1]	10368.7 [9952.5-10802.3]
2009-10						
Males	24	71	249	314	7	665
	7228.9 [4845.3-10785.2]	3846.2 [3047.9-4853.4]	5809.6 [5131.3-6578.0]	6446.3 [5771.3-7200.3]	3153.2 [1503.2-6614.2]	5754.1 [5333.0-6208.5]
Females	14	63	382	531	13	1003
	4590.2 [2718.5-7750.4]	3886.5 [3036.1-4975.1]	9229.3 [8348.6-10202.8]	12383.4 [11373.7-13482.8]	7831.3 [547.3-13487.2]	9535.1 [8962.9-10143.9]
Total	38	134	631	845	20	1668
	5965.5 [4340.7 - 8198.4]	3865.0 [3263 - 4578.1]	7489.6 [6927.4 - 8097.4]	9225.9 [8624.3 - 9869.4]	5154.6 [3325.5 - 7989.8]	7555.7 [7201.7 - 7927.2]
2008-09						
Males	19	64	243	219	3	548
	5722.9 [3650.3 - 8972.2]	3467.0 [2713.6 - 4429.5]	5669.6 [4999.8 - 6429.2]	4496.0 [3938.3 - 5132.7]	1351.4 [435.8 - 4190]	4741.7 [4360.9 - 5155.8]
Females	28	57	352	302	3	742
	9180.3 [6338.6 - 13296.1]	3516.3 [2712.3 - 4558.7]	8504.5 [7660.9 - 9441]	7042.9 [6291.7 - 7883.8]	1807.2 [582.9 - 5603.6]	7053.9 [6564.2 - 7580.2]
Total	47	121	595	521	6	1290
	7378.3 [5543.6 - 9820.2]	3490.0 [2920.4 - 4170.8]	7062.3 [6517 - 7653.2]	5688.4 [5220.3 - 6198.4]	1546.4 [694.7 - 3442.1]	5843.4 [5533.1 - 6171.2]
2007-08						
Males	23	46	253	103	0	425
	6927.7 [4603.6 - 10425.1]	2491.9 [1866.5 - 3326.8]	5902.9 [5218.6 - 6677]	2114.6 [1743.2 - 2565]	0.0 [0-0]	3677.4 [3343.9 - 4044.2]
Females	24	56	397	135	3	615
	7868.9 [5274.2 - 11739.9]	3454.7 [2658.6 - 4489]	9591.7 [8693.1 - 10583.2]	3148.3 [2659.6 - 3726.8]	1807.2 [582.9 - 5603.6]	5846.6 [5402.3 - 6327.4]
Total	47	102	650	238	3	1040

	0-4	5-9	10-14	15-19	20-24	Total Under 25
	7378.3 [5543.6 - 9820.2]	2942.0 [2423.1 - 3572.1]	7715.1 [7144.2 - 8331.6]	2598.5 [2288.5 - 2950.6]	773.2 [249.4 - 2397.4]	4711.0 [4433.2 - 5006.2]
2006-07						
Males	24	71	199	21	0	315
	7228.9 [4845.3 - 10785.2]	3846.2 [3047.9 - 4853.4]	4643.0 [4040.7 - 5335.1]	431.1 [281.1 - 661.2]	0.0 [0-0]	2725.6 [2440.6 - 3043.9]
Females	28	44	351	43	0	466
	9180.3 [6338.6 - 13296.1]	2714.4 [2020 - 3647.5]	8480.3 [7638 - 9415.6]	1002.8 [743.7 - 1352.1]	0.0 [0-0]	4430.1 [4045.6 - 4851.1]
Total	52	115	550	64	0	781
	8163.3 [6220.4 - 10712.9]	3317.0 [2762.9 - 3982.2]	6528.2 [6004.8 - 7097.2]	698.8 [546.9 - 892.8]	0.0 [0-0]	3537.8 [3298.2 - 3794.8]
2005-06						
Males	20	64	222	104	5	415
	6024.1 [3886.5 - 9337.5]	3467.0 [2713.6 - 4429.5]	5179.7 [4541.2 - 5907.9]	2135.1 [1761.8 - 2587.5]	2252.3 [937.4 - 5411.2]	3590.9 [3261.5 - 3953.6]
Females	19	34	320	148	4	525
	6229.5 [3973.5 - 9766.4]	2097.5 [1498.7 - 2935.5]	7731.3 [6929 - 8626.6]	3451.5 [2937.9 - 4054.9]	2409.6 [904.4 - 6420.4]	4991.0 [4581.8 - 5436.7]
Total	39	98	542	252	9	940
	6122.4 [4473.2 - 8379.7]	2826.7 [2318.9 - 3445.5]	6433.2 [5913.8 - 6998.3]	2751.4 [2431.8 - 3113]	2319.6 [1206.9 - 4458.1]	4258.0 [3994.3 - 4539.1]

12.2 Age/sex specific numbers and crude rates per 100,000 infants, children and young people with diabetes (95% Confidence Intervals) of DKA admissions using diabetes prevalent population, Wales (2005-06 to 2010-11)

	0-4	5-9	10-14	15-19	20-24	Total Under 25
2010-11						
Males	3	2	10	34	0	49
	10344.8 [3336.4 - 32075.5]	1923.1 [480.9 - 7689.5]	3921.6 [2110 - 7288.5]	9264.3 [6619.6 - 12965.7]	0.0 [0-0]	6464.4 [4885.7 - 8553.2]
Females	0	6	14	39	0	59
	0.0 [0-0]	7142.9 [3209 - 15899.4]	5185.2 [3070.9 - 8755.1]	13043.5 [9529.9 - 17852.4]	0.0 [0-0]	8885.5 [6884.4 - 11468.4]
Total	3	8	24	73	0	108
	7692.3 [2480.9 - 23851]	4255.3 [2128 - 8509.1]	4571.4 [3064.1 - 6820.3]	10961.0 [8714.1 - 13787.2]	0.0 [0-0]	7594.9 [6289.5 - 9171.3]
2009-10						
Males	2	8	8	28	0	54
	6896.6 [1724.8 - 27576.1]	7692.3 [3846.9 - 15381.8]	3137.3 [1568.9 - 6273.4]	7629.4 [5267.8 - 11049.9]	0 [0-0]	6068.6 [4545.5-8102.0]
Females	1	7	13	36	0	49
	10000 [1408.6 - 70993.3]	8333.3 [3972.7 - 17480.3]	4814.8 [2795.7 - 8292.1]	12040.1 [8684.8-16691.7]	0 [0-0]	8584.3 [6621.6-11128.9]

	0-4	5-9	10-14	15-19	20-24	Total Under 25
Total	3	15	21	64	0	103
	7692.3 [2480.9 - 23851]	7978.7 [4810.1 - 13234.8]	4000.0 [2608 - 6134.9]	9609.6 [7521.5 - 12277.4]	0 [0-0]	7243.3 [5971.2 - 8786.4]
2008-09						
Males	0	4	13	16	0	33
	0 [0-0]	3846.2 [1443.5 - 10247.9]	5098.0 [2960.2 - 8779.9]	4359.7 [2670.9 - 7116.4]	0 [0-0]	4353.6 [3095 - 6123.8]
Females	0	2	31	23	0	56
	0 [0-0]	2381.0 [595.5 - 9520.3]	11481.5 [8074.5 - 16326]	7692.3 [5111.7 - 11575.7]	0 [0-0]	8433.7 [6490.4 - 10958.9]
Total	0	6	44	39	0	89
	0 [0-0]	3191.5 [1433.8 - 7104]	8381.0 [6236.9 - 11262.1]	5855.9 [4278.5 - 8014.8]	0 [0-0]	6258.8 [5084.7 - 7704.1]
2007-08						
Males	1	4	11	8	0	24
	3448.3 [485.7 - 24480.4]	3846.2 [1443.5 - 10247.9]	4313.7 [2388.9 - 7789.4]	2179.8 [1090.1 - 4358.9]	0 [0-0]	3166.2 [2122.2 - 4723.8]
Females	0	7	13	9	0	29
	0.0 [0-0]	8333.3 [3972.7 - 17480.3]	4814.8 [2795.7 - 8292.1]	3010.0 [1566.1 - 5785.1]	0 [0-0]	4367.5 [3035 - 6284.9]
Total	1	11	24	17	0	53
	2564.1 [361.2 - 18203.4]	5851.1 [3240.3 - 10565.4]	4571.4 [3064.1 - 6820.3]	2552.6 [1586.8 - 4106.1]	0 [0-0]	3727.1 [2847.4 - 4878.7]
2006-07						
Males	1	5	12	1	0	19
	3448.3 [485.7 - 24480.4]	4807.7 [2001.1 - 11550.8]	4705.9 [2672.5 - 8286.4]	272.5 [38.4 - 1934.4]	0.0 [0-0]	2506.6 [1598.8 - 3929.8]
Females	0	2	8	1	0	11
	0.0 [0-0]	2381.0 [595.5 - 9520.3]	2963.0 [1481.8 - 5924.8]	334.4 [47.1 - 2374.4]	0.0 [0-0]	1656.6 [917.4 - 2991.4]
Total	1	7	20	2	0	30
	2564.1 [361.2 - 18203.4]	3723.4 [1775 - 7810.3]	3809.5 [2457.7 - 5904.8]	300.3 [75.1 - 1200.8]	0.0 [0-0]	2109.7 [1475.1 - 3017.4]
2005-06						
Males	0	3	11	9	0	23
	0 [0-0]	2884.6 [930.3 - 8944.1]	4313.7 [2388.9 - 7789.4]	2452.316 [1276 - 4713.2]	0 [0-0]	3034.3 [2016.4 - 4566.1]
Females	0	0	12	16	0	28
	0 [0-0]	0 [0-0]	4444.4 [2524 - 7826.1]	5351.171 [3278.3 - 8734.8]	0 [0-0]	4216.9 [2911.6 - 6107.4]
Total	0	3	23	25	0	51
	0 [0-0]	1595.7 [514.7 - 4947.8]	4380.9 [2911.2 - 6592.6]	3753.8 [2536.4 - 5555.3]	0 [0-0]	3586.5 [2725.7 - 4719.2]



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