NHS SCOTLAND

Scottish Diabetes Survey 2009

Scottish Diabetes Survey Monitoring Group

Foreword

The Scottish Diabetes Survey is now in its ninth year. This 2009 Survey, as with previous versions, continues to demonstrate an increase in the prevalence of diabetes and an increase in recording key data that reflects the quality of diabetes care across the whole of Scotland. This provides useful information for the Scottish Diabetes Action Plan review and should aid and influence NHS Boards in Scotland in service planning, audit and with quality improvement. It also offers great potential for epidemiological research.

The survey has some major strengths;

- It provides information on the whole population
- The data items collected are nationally agreed and evidence based
- The information is provided at NHS Board level, each responsible for the healthcare of their region.
- The system used to collect the data is integrated into the provision of care, and is available at all levels – from data for one individual, through the general practice, hospital unit, GP group, NHS Board and nationally.

The information collected also presents NHS Scotland a number of challenges

- The increasing prevalence of diabetes presents an organisational and resource pressure
- There are still many patients who do not appear to have key parameters measured or recorded. In two NHS Boards an automatic link between SCI-Store and SCI-DC has improved data capture and this will be implemented across all Boards this year.
- In this report we have presented data from people with Type 1 and Type 2 diabetes separately and found that 38 % of those with Type 1 diabetes have poor glycaemic control.
- There are data collection issues for those people with diabetes who receive specialist care at a clinic which does not link directly to the SCI-DC system. This will include some paediatric clinics and will rely on primary care staff entering the data from clinic letters.
- 20 % of people with diabetes do not appear to have an up-to-date eye screen, and this is worse (26 %) in those with Type 1 diabetes who are at greater risk of proliferative retinopathy.
- The use of the foot screening risk calculation needs further emphasis as it is not widely used.

In this survey we also attempted to ascertain what proportion of people with diabetes was achieving ideal targets for glycaemia, blood pressure and cholesterol. The glycaemic target was probably set unrealistically low making this calculation difficult to interpret.

The launch of the 2010 SIGN guideline for diabetes and the Diabetes Action Plan review presents a further opportunity to build on the work of the survey to encourage further improvements in diabetes care in Scotland.

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Chairman
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Executive Summary

This report presents the results of the 2009 Scottish Diabetes Survey. The survey collates data submitted by all 14 NHS Boards. The Scottish Diabetes Survey provides data on the number of people with diabetes, the effects on their health, and the progress being made to improve the delivery and outcomes of care for diabetes. In this survey, we report separately on those with type 1 and those with type 2 diabetes.

In this Scottish Diabetes Survey 2009, we report that:

- There were 228,004 people diagnosed with diabetes in Scotland recorded on local diabetes registers at the start of 2010. This represents 4.4% of the population
- Crude prevalence of diabetes ranged from 3.9% to 5% across NHS Boards.
- 87.4% (199,264) of all people registered with diabetes had type 2 diabetes
- 12% of all registered people had type 1 diabetes. The number of people with type 1 diabetes has increased from 26,294 in 2006 to 27,367 in this report.
- 0.6% (1,373) of the total registered population were recorded as having type "other" diabetes (which includes MODY and where the diabetes type is unknown)
- 36.5% of patients with a recorded BMI and type 1 diabetes and 32.3% of those with a recorded BMI and type 2 diabetes were overweight (BMI 25-29.9 kg/m^2), while 25.1% of those with type 1 and 54.4% of those with type 2 were obese (BMI ≥ 30 kg/m^2).
- 87.1% of those with type 1 diabetes and 89.9% of those with type 2 diabetes had an HbA1c recorded in the pervious 15 months. Of these, 21.8% and 63.8% respectively had a result <7.5%, the target reported in previous surveys
- 86.1% of those with type 1 and 95% of those with type 2 diabetes had their blood pressure recorded in the previous 15 months. 56.6% and 44.4% respectively had a systolic BP measurement of ≤ 130 mmHg.
- Cholesterol was recorded in 86.5% of patients within the previous 15 months, and the target of ≤5 mmol/l was achieved in 71.6% of those with type 1 and 81.8% of those with type 2 diabetes.
- 6.4% of those with type 1 and 29.8% of those with type 2 diabetes achieved all three targets of HbA1c<7%, diastolic BP of <80mmHg and cholesterol of <5 mmol/l.
- 24.6% of those with type 1 and 18.8% of those with type 2 diabetes are current smokers.
- 80.6% of people with diabetes had eye screening in the previous 15 months, including those attending ophthalmology services.
- 1,824 (0.8%) people with diabetes were reported to be blind, but not all because of diabetes.
- 59.5% of patients with type 1 diabetes and 78.8% of those with type 2 had their foot pulses checked in the previous 15 months
- 185 (0.7%) of those with type 1 and 947 (0.5%) of those with type 2 diabetes have had a lower limb amputation
- 254 (0.9%) of those with type 1 and 872 (0.4%) of those with type 2 diabetes have been recorded as having end stage renal failure.
- 1,026 (3.7%) of those with type 1 and 20,445 (10.3%) of those with type 2 diabetes have had a myocardial infarction and survived, and 2.7% and 6.8% respectively have undergone cardiac revascularisation.

Prevalence

At the beginning of 2010 there were 228,004 people with known diabetes in Scotland recorded on local diabetes registers, which represents a crude prevalence of 4.4% of the population. In the 2008 Scottish Diabetes Survey, 219,963 people (4.3%) were known to have diabetes. The increase in reported prevalence depends on a number of factors, including:

- demographic change. Diabetes is more prevalent in older people so an increase in the number of people over that age will increase the prevalence of diabetes
- an increase in the incidence of type 2 diabetes, related to rising levels of overweight and obesity
- possibly, a fall in the age of onset of type 2 diabetes
- an increase in the incidence of type 1 diabetes. We know that there has been a steady increase in the incidence of diabetes in Scottish children over the last 40 years
- better survival because of improved control of blood glucose, blood pressure and cholesterol level
- possibly better detection of diabetes in people with type 2 diabetes, many of whom have no symptoms

Variation between health boards also depends on deprivation, the age and the ethnic distribution of the population of each board. However the broad similarity of reported prevalence, compared to some previous years, give confidence in the completeness of recording. The increased prevalence is likely to be real rather than because of better reporting.

Table 1 Diabetes Register: Percentage of total population

NHS Board	Mid 2008 Population	Number on Diabetes Register at start of 2010	Crude Prevalence %
Ayrshire & Arran	367,510	18,067	4.9%
Borders	112,430	5,137	4.6%
Dumfries & Galloway	148,580	7,348	5.0%
Fife	361,815	16,759	4.6%
Forth Valley	290,047	13,105	4.5%
Grampian	539,630	22,481	4.2%
Greater Glasgow & Clyde	1,194,675	52,604	4.4%
Highland	309,900	13,246	4.3%
Lanarkshire	561,174	26,350	4.7%
Lothian	817,727	31,824	3.9%
Orkney	19,890	894	4.5%
Shetland	21,980	912	4.2%
Tayside	396,942	18,157	4.6%
Western Isles	26,200	1,120	4.3%
Scotland	**5,168,500**	**228,004**	**4.4%**

Figure 1 Number of people recorded with diabetes 2001-2009 – all types of diabetes

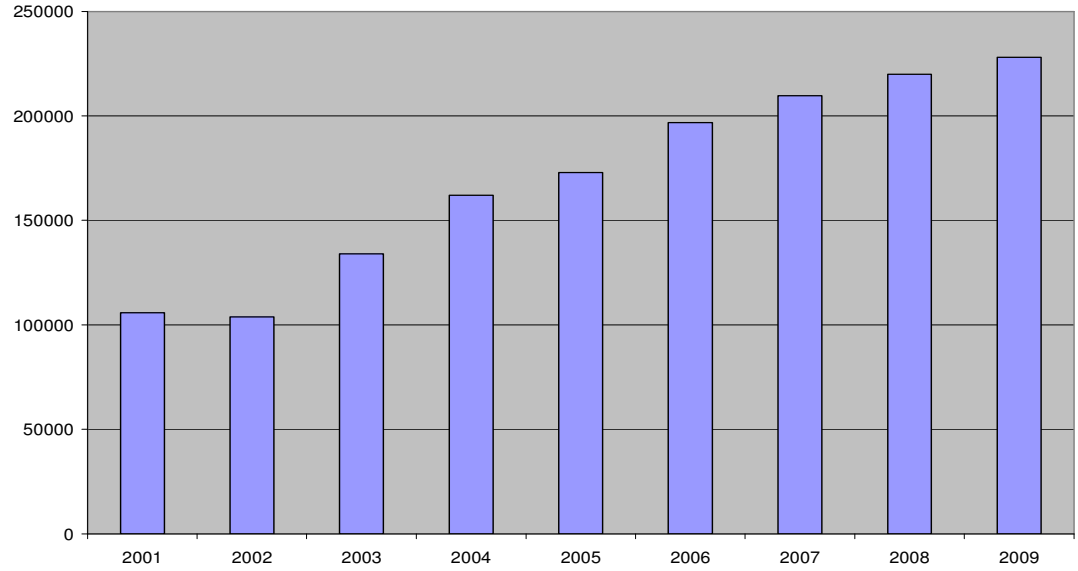


Table 2 Number of patients included in Scottish Diabetes Surveys 2001-2009

Survey	Number on Diabetes Register	Crude Prevalence	Relative change from previous year, number and percent		Absolute increase
2009	**228,004**	**4.4%**	**8,041**	**3.7%**	**0.1%**
2008	219,963	4.3%	10,257	4.9%	0.2%
2007	209,706	4.1%	12,905	6.6%	0.2%
2006	196,801	3.9%	24,014	13.9%	
2005	172,787	3.4%	10,841	6.7%	
2004	161,946	3.2%	27,982	20.9%	
2003	133,964	2.6%	30,129	29.0%	
2002	103,835	2.0%	-1,942	-1.8%	

Note: SCI-DC achieved complete coverage of Health Board areas in 2006.

Between 2001 and 2006, the increase in numbers was partly due to improved recording. Since 2007, we are confident the data are a reflection of a real increase in numbers.

Figure 2 Number of people with all types of diabetes in each NHS Board in 2009

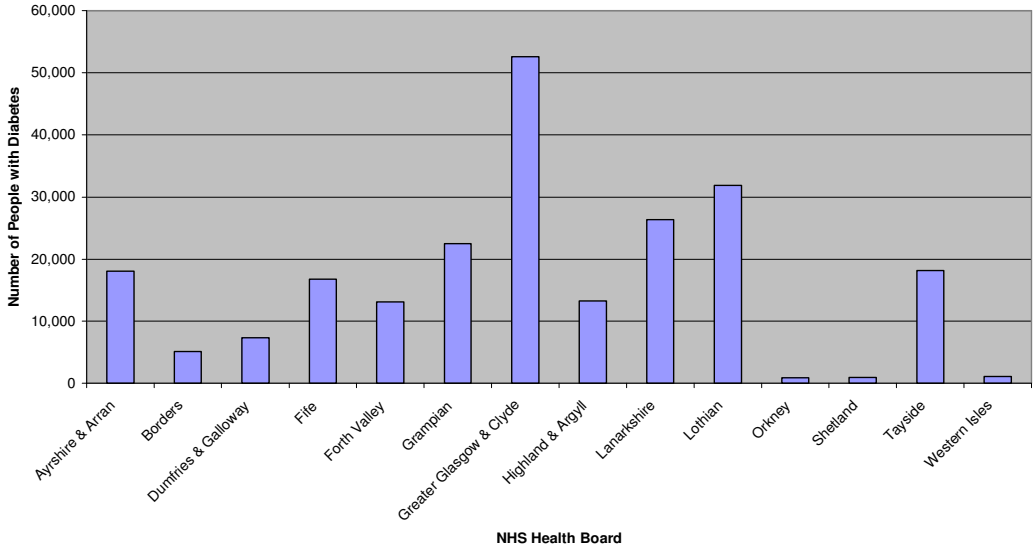
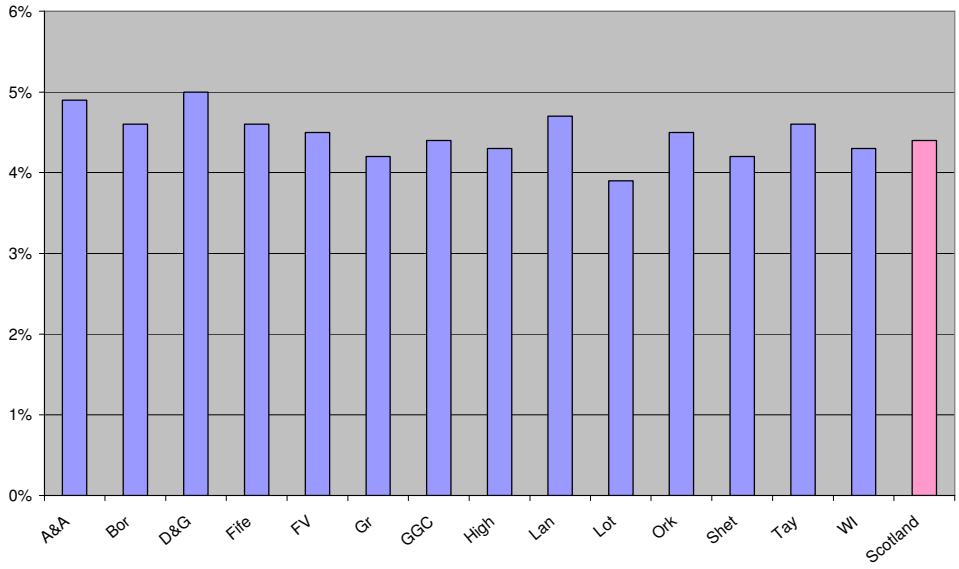


Figure 3 Diabetes prevalence in each NHS board



Differences in prevalence are due to a number of factors. One is age - diabetes is more common in older age groups so the age structure of an area will affect the crude prevalence. A health board area with an older population will have a higher crude prevalence.

For example, the Dumfries & Galloway prevalence is 13% above the Scottish average. But if we were to adjust that for the age of the population, the Dumfries & Galloway prevalence would actually be lower than the Scottish average. Other reasons for differences in observed prevalence were given at the start of this section.

Gender

More men than women have diagnosed diabetes; 56.1% compared with 43.9% in those with type 1 diabetes and 54.6% compared with 45.4% in those with type 2 diabetes. This ratio is relatively unchanged from 2001.

Duration of Diabetes

The date of diagnosis was recorded for 99.5% of patients, of which 8.4% have had diabetes for less than one year and 8.5% have had diabetes for 20 years or more. Work to make this data more accurate is ongoing through the epidemiology subgroup of the Scottish Diabetes Research Network

Table 3 Recording of date of diagnosis 2002-2009 (all types of diabetes)

Year	Recorded
2009	**99.5%**
2008	99.2%
2007	98.6%
2006	97.6%
2005	92.6%
2004	84.2%
2003	81.5%
2002	76.9%

Table 4 Duration of diabetes (years since diagnosis) by type of diabetes

Duration (Years)	Type 1 Diabetes		Type 2 Diabetes		For T1 and T2 Diabetes	
	Number of patients	%	Number of patients	%	Total Numbers	Total %
< 1	1,000	3.7%	17,950	9.0%	18,950	8.4%
1-4	3,774	13.9%	64,640	32.6%	68,414	30.4%
5-9	4,940	18.2%	64,842	32.7%	69,782	31%
10-14	4,102	15.1%	28,126	14.2%	32,228	14.3%
15-19	3,605	13.3%	13,366	6.7%	16,971	7.5%
20-24	2,740	10.1%	5,490	2.8%	8,230	3.7%
25-29	2,258	8.3%	2,202	1.1%	4,460	2%
30-34	1,790	6.6%	828	0.4%	2,618	1.2%
35-39	1,211	4.5%	381	0.2%	1,592	0.7%
40-44	768	2.8%	193	0.1%	961	0.4%
45-49	469	1.7%	89	0.04%	558	0.3%
≥50	441	1.6%	174	0.1%	615	0.3%
Total	**27,098**	**100%**	**198,281**	**100%**	**225,379**	**100%**

Note: Excludes patients where date of diagnosis not known (n = 1,252)

Age

Diabetes is more common in older people; 114,864 (50.4%) of all the people reported in the survey are aged 65 years or older. The possibility that type 2 diabetes is developing in people at a younger age is currently under investigation. This may have long-term implications for the NHS, because they will have diabetes for long enough to develop complications such as renal failure.

Figure 4 Age of people recorded with diabetes

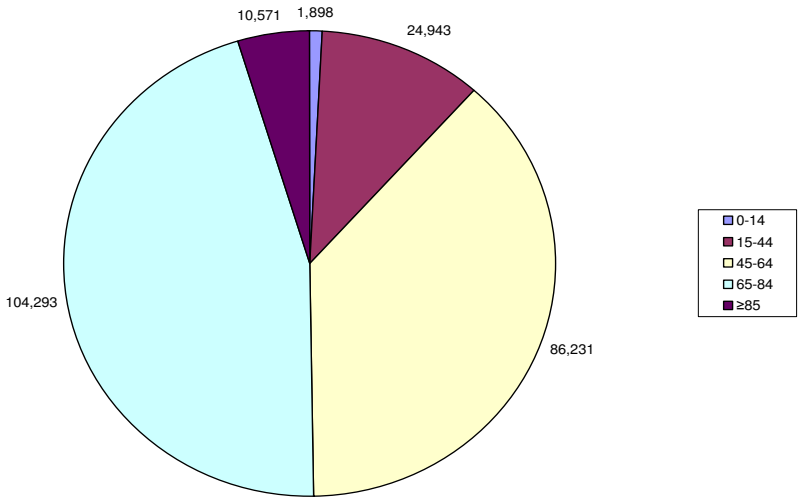


Table 5 Age group of people recorded with diabetes

Year		0-14	15-44	45-64	65-84	≥85	Not known	Total diabetes population
2009	Number	1,898	24,943	86,231	104,293	10,571	68	228,004
	Percentage	0.8%	10.9%	37.8%	45.8%	4.6%	0.0%	100%

Table 6 Age group of people recorded with type 1 or type 2

Age	Type 1 diabetes		Type 2 diabetes	
0-4	94	0.3%	1	0.0%
5-9	482	1.8%	8	0.0%
10-14	1,268	4.6%	12	0.0%
15-19	1,791	6.5%	77	0.0%
20-24	2,072	7.6%	199	0.1%
25-29	2,070	7.6%	531	0.3%
30-34	2,067	7.6%	1,255	0.6%
35-39	2,686	9.8%	2,836	1.4%
40-44	2,901	10.6%	6,166	3.1%
45-49	2,852	10.4%	11,073	5.6%
50-54	2,403	8.8%	16,374	8.2%
55-59	1,850	6.8%	21,380	10.7%
60-64	1,617	5.9%	28,147	14.1%
65-69	1,134	4.1%	28,645	14.4%
70-74	939	3.4%	30,259	15.2%
75-79	664	2.4%	25,542	12.8%
80-84	331	1.2%	16,319	8.2%
>=85	139	0.5%	10,381	5.2%
Age unknown	7	0.0%	59	0.0%
Total	**27,367**	**100%**	**199,264**	**100%**

Type of diabetes

The majority of registered patients had type 2 diabetes (87.4%). The proportion of people with diabetes who have type 1 diabetes has fallen from 18.2% in 2002 to 12.0% in 2009, probably largely due to relatively more complete recording of data from people with type 1 diabetes than type 2 diabetes in earlier years. However, the absolute number of patients with type 1 diabetes continues to increase (22,597 in 2003; 27,367 in 2009). This reflects the rising incidence of type 1 diabetes in children over the last 30 years. We know from a series of studies of incidence that it has been rising by 2-3% a year since 1968.

The SCI-DC development team in conjunction with the Scottish Diabetes Research Network's epidemiology subgroup are working to improve the recording of the type of diabetes and the diagnosis date where data sources disagree on these items. This may occur because patient details are recorded on more than one system (e.g. practice versus diabetes clinics, etc)

Some Boards have dedicated data facilitators who ensure the quality of data in SCI-DC. NHS Tayside, for example, runs a number of initiatives which help reduce the occurrence of erroneous diagnoses dates and misclassification of diabetes types. These include:

1. Opportunistic validation by the Diabetes Data Facilitator who encourages and receives feedback where diagnostic data are challenged. This includes feedback from the research community.
2. Active erroneous data searches e.g. investigation of type 1 patients where no insulin prescribing can be found or type 2 patients aged under 10 years.

3. The recent implementation of the Tayside Diabetes Local Enhanced Service (LES), in which a condition of payment (by Primary care Services) is that all Type 2 patients since 2007 have their diabetes type and date of diagnosis registered onto SCI-DC which then MUST be verified by a SCI-DC Administration webform.
4. Referral to diabetes type specific education programmes (TIM for Type 1 and TDEP for Type 2) where misclassification, if found by those running the education sessions, is fed-back to the MCN for investigation and corrected where required in collaboration with general practice staff.
5. Continuous encouragement by the MCN that all patients be registered onto SCI-DC by a SCI-DC Administration webform and that this should be done when the date of diagnosis and diabetes type are known to be true.

Where diagnostic details are found incorrect, and where evidence or dialogue with the patient's primary carer confirms the true details, the SCI-DC records are amended accordingly.

Other types of diabetes include Maturity Onset Diabetes of the Young (MODY), gestational diabetes and secondary diabetes.

Figure 5 Type of diabetes

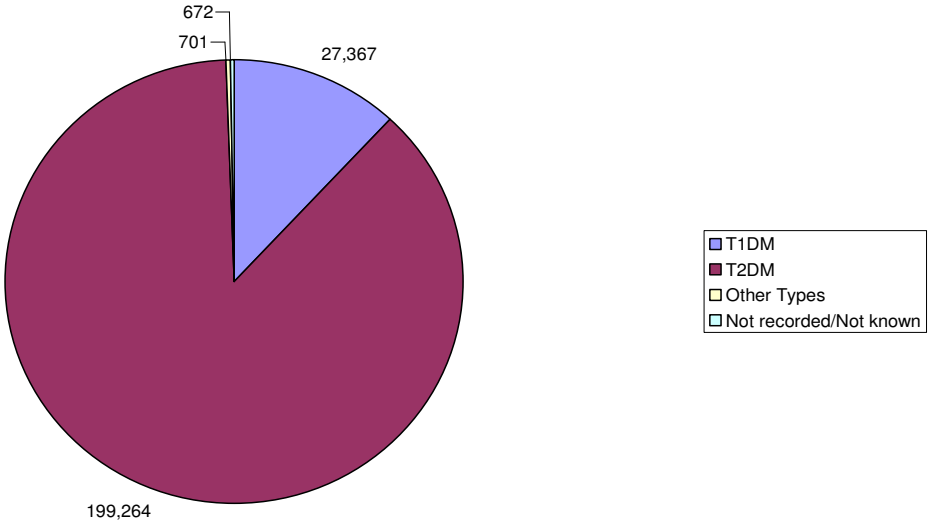


Table 7 Type of diabetes by NHS board

NHS Board	Type 1*		Type 2*		Other Types of Diabetes	Not recorded/ Not known	Total
Ayrshire & Arran	2,234	12.4%	15,754	87.2%	21	58	18,067
Borders	596	11.6%	4,530	88.2%	5	6	5,137
Dumfries & Galloway	871	11.9%	6,453	87.8%	16	8	7,348
Fife	1,896	11.3%	14,718	87.8%	52	93	16,759
Forth Valley	1,526	11.6%	11,543	88.1%	11	25	13,105
Grampian	2,976	13.2%	19,361	86.1%	53	91	22,481
Greater Glasgow and Clyde	5,923	11.3%	46,345	88.1%	203	133	52,604
Highland	1,688	12.7%	11,470	86.6%	28	60	13,246
Lanark	3,454	13.1%	22,794	86.5%	54	48	26,350
Lothian	4,019	12.6%	27,506	86.4%	215	84	31,824
Orkney	118	13.2%	776	86.8%	0	0	894
Shetland	114	12.5%	792	86.8%	1	5	912
Tayside	1,771	9.8%	16,283	89.7%	42	61	18,157
Western Isles	181	16.2%	939	83.8%	0	0	1,120
Scotland	**27,367**	**12%**	**199,264**	**87.4%**	**701**	**672**	**228,004**

*Percentages (of the total diabetes populations) have been calculated for type 1 and type 2 diabetes only. These patients will be the focus of the remainder of this report.

Ethnicity

Ethnicity data was available for 56.04% of the registered diabetic population. The completeness of this information fell from 37% in 2002 to 24.4% in 2006, increased to 33.3% in 2007 and again to 56.04% in 2009.

Table 8 Recording of ethnic group by NHS board (Type 1 and Type 2)

NHS Board	Ethnic group identified		Not recorded / Not known	
	Number	%	Number	%
Ayrshire & Arran	5,515	30.7%	12,473	69.3%
Borders	1,889	36.9%	3,237	63.1%
Dumfries & Galloway	5,308	72.5%	2,016	17.5%
Fife	4,323	26.0%	12,291	74.0%
Forth Valley	10,828	82.9%	2,241	17.1%
Grampian	6,540	29.3%	15,797	70.7%
Greater Glasgow and Clyde	40,706	77.9%	11,562	22.1%
Highland	5,039	38.3%	8,119	61.7%
Lanark	11,539	44.0%	14,709	56.0%
Lothian	21,397	67.9%	10,128	32.1%
Orkney	482	53.9%	412	46.1%
Shetland	481	53.1%	425	46.9%
Tayside	12,772	70.7%	5,282	29.3%
Western Isles	178	15.9%	942	84.1%
Scotland	**126,997**	**56.0%**	**99,634**	**44.0%**

Table 9 Recording of ethnic group 2001-2009 (Type 1 and type 2)

Year	Number identified	Percentage identified
2009	**126,997**	**56.0%**
2008	94,925	43.2%
2007	69,875	33.3%
2006	48,035	24.4%
2005	42,164	25.0%
2004	44,695	30.6%
2003	49,614	37.0%
2002	32,036	30.9%

Body Mass Index

Body Mass Index (BMI) has been recorded for 89.7% of patients in the previous 15 months. Of these 32.7% are overweight (BMI 25-29.9kg/m^2) and 51.0% are obese (BMI 30kg/m^2 or over). Despite type 2 diabetes being more prevalent in obese patients, 12.7% have normal weight (BMI 18.5-24.9kg/m^2) and 32.3% are overweight (BMI 25-29.9 kg/m^2).

Table 10 Percentage of patients with a recording of BMI in the previous 15 months for each health board in Scotland

NHS Board	Type 1 diabetes	Type 2 diabetes	Total recorded	Total not recorded
	BMI recorded %	BMI recorded %		
Ayrshire & Arran	87.1%	90.0%	16,037	1,856
Borders	90.4%	93.5%	4,752	349
Dumfries & Galloway	84.5%	88.8%	6,441	853
Fife	88.2%	90.3%	14,888	1,648
Forth Valley	89.7%	90.7%	11,783	1,220
Grampian	87.6%	92.1%	20,344	1,891
Greater Glasgow & Clyde	87.2%	88.9%	46,178	5,879
Highland	86.2%	91.0%	11,833	1,255
Lanarkshire	84.6%	87.6%	22,772	3,336
Lothian	90.5%	90.5%	28,443	2,973
Orkney	91.2%	86.6%	776	114
Shetland	90.0%	85.6%	777	125
Tayside	83.8%	91.5%	16,333	1664
Western Isles	88.1%	86.0%	963	152
Scotland	**87.3%**	**90.0%**	**202,320**	**23,315**

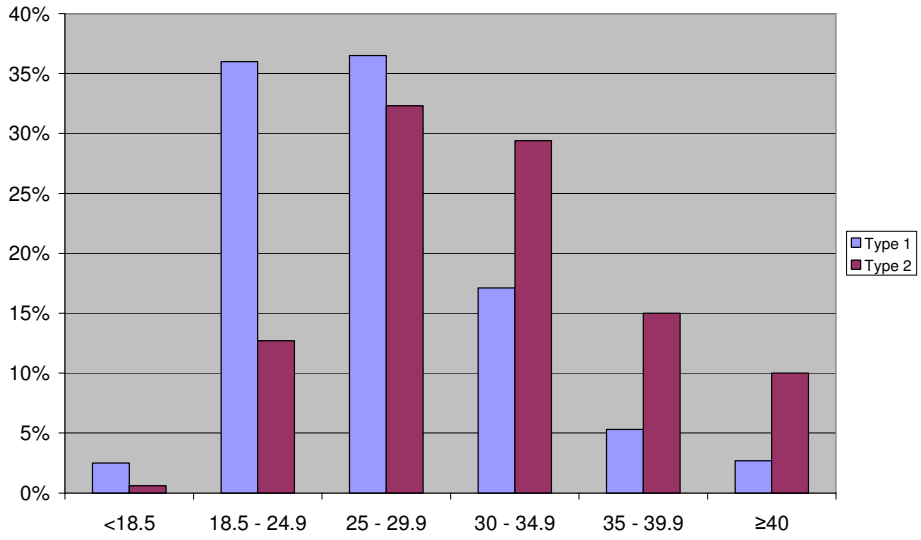
Note: Excludes children under 12 years of age (n = 996)

Table 11 Percentage of patients with a recording of BMI in the previous 15 months 2001-2009 (Type 1 and Type 2 diabetes)

Year	BMI recorded
2009	**89.7%**
2008	87.4%
2007	85.3%
2006	84.8%
2005	69.1%
2004	66.1%
2003	58.9%
2002	52.3%
2001	39.8%

Note: Excludes children under 12 years of age

Figure 6 Percent of patients by BMI Range recorded in previous 15 months in patients with type 1 and type 2 diabetes



Note: Excludes children under 12 years (n=996)

Table 12 Number of people in BMI categories by NHS board for all patients with type 1 diabetes

NHS Board	BMI <18.5	BMI 18.5 - 24.9	BMI 25 - 29.9	BMI 30 - 34.9	BMI 35 - 39.9	BMI ≥40	Not recorded/ not complete/ not known		Total
Ayrshire & Arran	41	615	680	335	127	67	275	12.9%	2,140
Borders	7	178	185	101	32	15	55	9.6%	573
Dumfries & Galloway	21	243	244	125	44	34	130	15.5%	841
Fife	38	527	613	294	92	41	215	11.8%	1,820
Forth Valley	38	511	461	204	66	30	150	10.3%	1,460
Grampian	61	892	942	427	139	57	357	12.4%	2,875
Greater Glasgow & Clyde	142	1,849	1,780	861	218	130	734	12.8%	5,714
Highland	23	452	584	247	56	33	223	13.8%	1,618
Lanarkshire	96	962	954	528	183	80	512	15.4%	3,315
Lothian	87	1,387	1,277	526	169	92	373	9.5%	3,911
Orkney	2	43	30	21	4	4	10	8.8%	114
Shetland	2	31	42	17	6	1	11	10%	110
Tayside	18	545	542	237	70	24	278	16.2%	1,714
Western Isles	2	51	72	22	5	3	21	11.9%	176
Scotland	**578**	**8,286**	**8,406**	**3,945**	**1,211**	**611**	**3,344**	**12.7%**	**26,381**

Note: Excludes children under 12 years of age (n = 986)

Table 13 BMI categories by NHS board for patients with type 1 diabetes as a percentage of those with BMI recorded

NHS Board	BMI <18.5	BMI 18.5 - 24.9	BMI 25 - 29.9	BMI 30 - 34.9	BMI 35 - 39.9	BMI ≥40	Total recorded	Not known
Ayrshire & Arran	2.2%	33%	36.5%	18%	6.8%	3.6%	1,865	275
Borders	1.4%	34.4%	35.7%	19.5%	6.2%	2.9%	518	55
Dumfries & Galloway	3%	34.2%	34.3%	17.6%	6.2%	4.8%	711	130
Fife	2.4%	32.8%	38.2%	18.3%	5.7%	2.6%	1,605	215
Forth Valley	2.9%	39%	35.2%	15.6%	5%	2.3%	1,310	150
Grampian	2.4%	35.4%	37.4%	17%	5.5%	2.3%	2,518	357
Greater Glasgow & Clyde	2.9%	37.1%	35.7%	17.3%	4.4%	2.6%	4,980	734
Highland	1.6%	32.4%	41.9%	17.7%	4%	2.4%	1,395	223
Lanarkshire	3.4%	34.3%	34%	18.8%	6.5%	2.9%	2,803	512
Lothian	2.5%	39.2%	36.1%	14.9%	4.8%	2.6%	3,538	373
Orkney	1.9%	41.3%	28.8%	20.2%	3.8%	3.8%	104	10
Shetland	2%	31.3%	42.4%	17.2%	6.1%	1%	99	11
Tayside	1.3%	37.9%	37.7%	16.5%	4.9%	1.7%	1,436	278
Western Isles	1.3%	32.9%	46.4%	14.2%	3.2%	1.9%	155	21
Scotland	**2.5%**	**36%**	**36.5%**	**17.1%**	**5.3%**	**2.7%**	**23,037**	**3,344**

Note: Excludes children under 12 years of age (n = 986)

Table 14 Number of patients by BMI categories by NHS board for all patients with type 2 diabetes

NHS Board	BMI <18.5	BMI 18.5 - 24.9	BMI 25 - 29.9	BMI 30 - 34.9	BMI 35 - 39.9	BMI ≥40	BMI not Recorded (n and %)		Total
Ayrshire & Arran	77	1,826	4,558	4,230	2,035	1,446	1,581	10%	15,753
Borders	19	532	1,420	1,239	621	403	294	6.5%	4,528
Dumfries & Galloway	29	679	1,916	1,701	849	556	723	11.2%	6,453
Fife	67	1,564	4,146	3,866	2,165	1,475	1,435	9.7%	14,718
Forth Valley	55	1,224	3,235	3,105	1,678	1,176	1,070	9.3%	11,543
Grampian	127	2,321	5,949	5,233	2,577	1,619	1,534	7.9%	19,360
Greater Glasgow & Clyde	242	5,721	13,628	11,875	5,757	3,975	5,145	11.1%	46,343
Highland	56	1,313	3,455	3,069	1,555	990	1,032	9%	11,470
Lanarkshire	120	2,429	6,156	6,127	3,147	1,990	2,824	12.4%	22,793
Lothian	164	3,140	7,896	7,167	3,851	2,687	2,600	9.5%	27,505
Orkney	1	59	188	245	101	78	104	13.8%	776
Shetland	10	63	207	195	122	81	114	14.4%	792
Tayside	100	1,911	4,820	4,439	2,237	1,390	1,386	8.5%	16,283
Western Isles	5	71	269	266	111	86	131	14%	939
Scotland	**1,072**	**22,853**	**57,843**	**52,757**	**26,806**	**17,952**	**19,971**	**10%**	**199,254**

Note: Excludes children under 12 years of age (n = 10)

Table 15 BMI categories by NHS board for patients with type 2 diabetes as a percentage of those with BMI recorded

NHS Board	BMI <18.5	BMI 18.5 - 24.9	BMI 25 - 29.9	BMI 30 - 34.9	BMI 35 - 39.9	BMI ≥40	Total	Not known
Ayrshire & Arran	0.5%	12.9%	32.1%	29.8%	14.4%	10.2%	14,172	1,581
Borders	0.4%	12.6%	33.5%	29.3%	14.7%	9.5%	4,234	294
Dumfries & Galloway	0.5%	11.8%	33.4%	29.7%	14.8%	9.7%	5,730	723
Fife	0.5%	11.8%	31.2%	29.1%	16.3%	11.1%	13,283	1,433
Forth Valley	0.5%	11.7%	30.9%	29.6%	16%	11.2%	10,473	1,070
Grampian	0.7%	12.8%	32.9%	28.9%	14.2%	8.9%	17,826	1,534
Greater Glasgow & Clyde	0.5%	13.9%	33.1%	28.8%	14%	9.6%	41,198	5,145
Highland	0.5%	12.6%	33.1%	29.4%	14.9%	9.5%	10,438	1,032
Lanarkshire	0.6%	12.2%	30.8%	30.7%	15.8%	10%	19,969	2,824
Lothian	0.7%	12.6%	31.7%	28.8%	15.5%	10.8%	24,905	2,600
Orkney	0.1%	8.8%	28%	36.5%	15%	11.6%	672	104
Shetland	1.5%	9.3%	30.5%	28.8%	18%	11.9%	678	114
Tayside	0.7%	12.8%	32.4%	29.8%	15%	9.3%	14,897	1,386
Western Isles	0.6%	8.8%	33.3%	32.9%	13.7%	10.6%	808	131
Scotland	**0.6%**	**12.7%**	**32.3%**	**29.4%**	**15%**	**10%**	**179,283**	**19,971**

Glycaemic Control

89.5% of patients had an HbA_{1c} recorded in the previous 15 months. In 52.7% of patients with a recorded result, HbA_{1c} was less than 7.5%, suggesting quite good control of diabetes. While all laboratories in Scotland are using a standardised (DCCT aligned) HbA_{1c} assay, there are some slight differences in actual results between laboratories. This should be considered when comparing results from different health board areas. SIGN is reviewing targets for glycaemic control. It should be noted that HbA_{1c} is higher in the winter with a variability of 0.5%.

Figure 7 Percentage of patients with a recording of HbA_{1c} within the previous 15 months

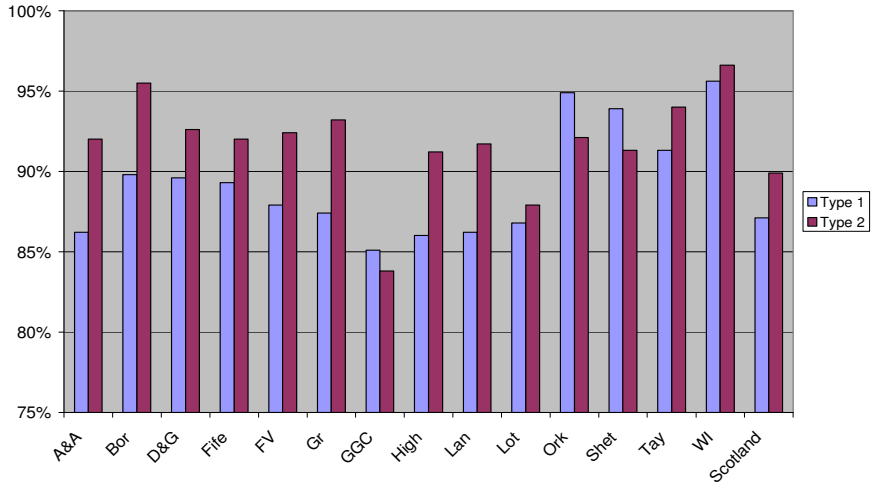


Table 16 Recording of HbA_{1c} within previous 15 months by NHS board

NHS Board	Type 1 Diabetes			Type 2 Diabetes			Total recorded
	Recorded within previous 15 months		Not recorded	Recorded within previous 15 months		Not recorded	
Ayrshire & Arran	1926	86.2%	308	14498	92%	1256	16,424
Borders	535	89.8%	61	4324	95.5%	206	4,859
Dumfries & Galloway	780	89.6%	91	5976	92.6%	477	6,756
Fife	1694	89.3%	202	13536	92%	1182	15,230
Forth Valley	1341	87.9%	185	10666	92.4%	877	12,007
Grampian	2602	87.4%	374	18044	93.2%	1317	20,646
Greater Glasgow & Clyde	5043	85.1%	880	38817	83.8%	7528	43,860
Highland	1452	86%	236	10465	91.2%	1005	11,917
Lanarkshire	2976	86.2%	478	20903	91.7%	1891	23,879
Lothian	3488	86.8%	531	24168	87.9%	3338	27,656
Orkney	112	94.9%	6	715	92.1%	61	827
Shetland	107	93.9%	7	723	91.3%	69	830
Tayside	1617	91.3%	154	15310	94%	973	16,927
Western Isles	173	95.6%	8	907	96.6%	32	1,080
Scotland	**23846**	**87.1%**	**3521**	**179052**	**89.9%**	**20212**	**202,898**

Table 17 Recording of HbA_{1c} in previous 15 months 2001-2009 (T1 and T2)

Year	Recorded within previous 15 months
2009	**89.5%**
2008	89.8%
2007	88.7%
2006	87%
2005	84%
2004	73.6%
2003	48.8%
2002	70.8%
2001	72.7%

9,096 (38.1%) of patients with type 1 diabetes who had an HbA1c recorded have a result >9%, which is considered as poor control. This is despite high rates of measurement of HbA1c. These data emphasise the difficulty in achieving good control for a substantial number of patients with type 1 diabetes. The data are consistent with similar data from GP practices in England (Calvert BMJ 2009) and shows A somewhat worse picture than some other European countries (Hanberger Diabetes Care 2008, Margeirsdottir Diabetologia 2007)

Figure 8 Percentage of Type 1 patients in each HbA_{1c} category for HbA_{1c} recorded in the previous 15 months

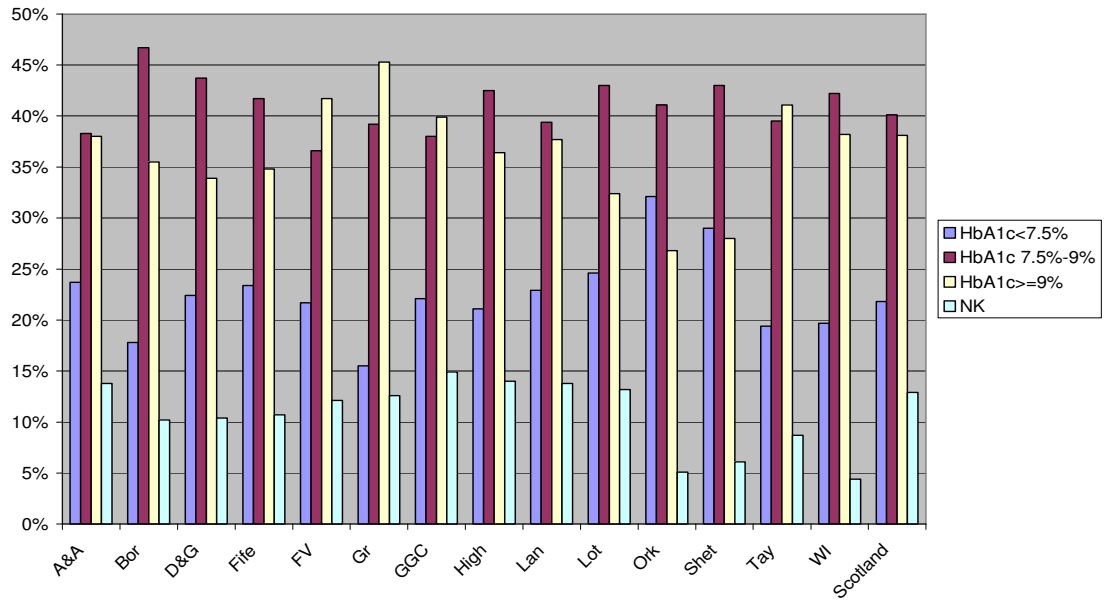


Figure 9 Percentage of Type 2 patients in each HbA_{1c} category for HbA_{1c} recorded in the previous 15 months

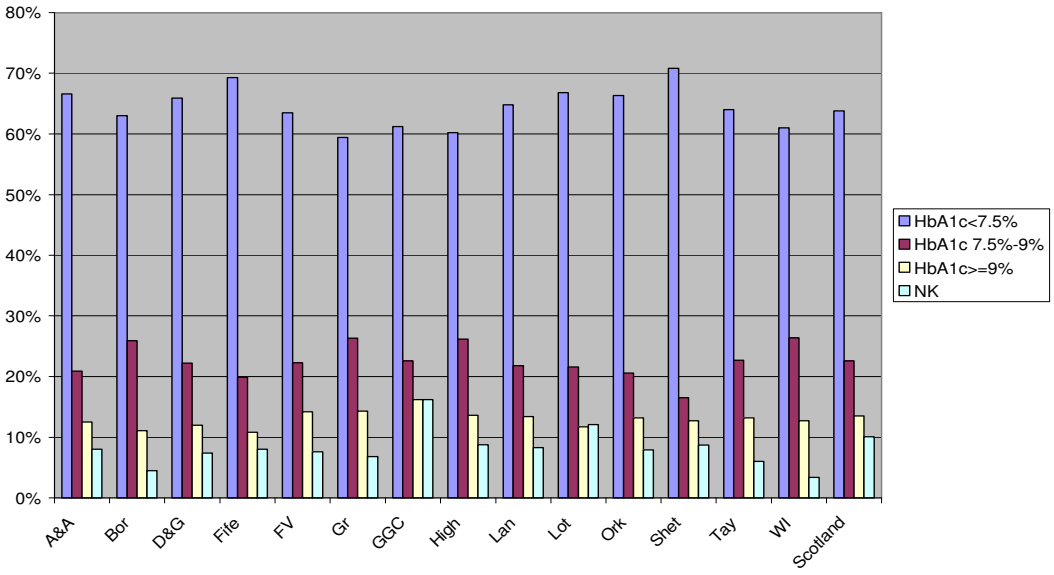


Table 18 Type 1 diabetes: HbA_{1c} category as percent of patients with HbA_{1c} recorded in previous 15 months

NHS Board	HbA1c < 7.5		HbA1c 7.5 - 9.0		HbA1c > 9.0		Total recorded	Not recorded
Ayrshire & Arran	457	23.7%	738	38.3%	731	38.0%	1,926	308
Borders	95	17.8%	250	46.7%	190	35.5%	535	61
Dumfries & Galloway	175	22.4%	341	43.7%	264	33.9%	780	91
Fife	397	23.4%	707	41.7%	590	34.8%	1,694	202
Forth Valley	291	21.7%	491	36.6%	559	41.7%	1,341	185
Grampian	403	15.5%	1,020	39.2%	1,179	45.3%	2,602	374
Greater Glasgow & Clyde	1,115	22.1%	1,917	38.%	2,011	39.9%	5,043	880
Highland	307	21.1%	617	42.5%	528	36.4%	1,452	236
Lanark	682	22.9%	1,171	39.4%	1,123	37.7%	2,976	478
Lothian	857	24.6%	1,501	43%	1,130	32.4%	3,488	531
Orkney	36	32.1%	46	41.1%	30	26.8%	112	6
Shetland	31	29.0%	46	43%	30	28.0%	107	7
Tayside	314	19.4%	638	39.5%	665	41.1%	1,617	154
Western Isles	34	19.7%	73	42.2%	66	38.2%	173	8
Scotland	**5,194**	**21.8%**	**9,556**	**40.1%**	**9,096**	**38.1%**	**23,846**	**3521**

Table 19 Type 2 diabetes: HbA_{1c} category as percentage of patients with HbA_{1c} recorded in previous 15 months

NHS Board	HbA1c < 7.5		HbA1c 7.5 - 9.0		HbA1c > 9.0		Total recorded	Not recorded
Ayrshire & Arran	9,655	66.6%	3,028	20.9%	1,814	12.5%	14,497	1256
Borders	2,724	63.0%	1,120	25.9%	480	11.1%	4,324	206
Dumfries & Galloway	3,936	65.9%	1,326	22.2%	714	12.0%	5,976	477
Fife	9,386	69.3%	2,694	19.9%	1,456	10.8%	13,536	1182
Forth Valley	6,771	63.5%	2,380	22.3%	1,515	14.2%	10,666	877
Grampian	10,722	59.4%	4,738	26.3%	2,583	14.3%	18,043	1317
Greater Glasgow & Clyde	23,756	61.2%	8,764	22.6%	6,297	16.2%	38,817	7528
Highland	6,296	60.2%	2,742	26.2%	1,427	13.6%	10,465	1005
Lanark	13,551	64.8%	4,547	21.8%	2,805	13.4%	20,903	1891
Lothian	16,139	66.8%	5,212	21.6%	2,817	11.7%	24,168	3338
Orkney	474	66.3%	147	20.6%	94	13.2%	715	61
Shetland	512	70.8%	119	16.5%	92	12.7%	723	69
Tayside	9,805	64.0%	3,480	22.7%	2,025	13.2%	15,310	973
Western Isles	553	61.0%	239	26.4%	115	12.7%	907	32
Scotland	**114,280**	**63.8%**	**40,536**	**22.6%**	**24,234**	**13.5%**	**179,050**	**20212**

Table 20 HbA_{1c} category 2004-2009 (as percentage of results recorded) - Type 1 and Type 2 diabetes

Year		HbA_{1c} <7.5	HbA_{1c} 7.5-9.0	HbA_{1c} >9.0	Total recorded	Not known
2009	**Number**	**119,474**	**50,092**	**33,330**	**202,896**	**23,735**
	Percentage	**58.9%**	**24.7%**	**16.4%**		
2008	Number	114,540	51,754	31,289	197,583	22,380
	Percentage	58%	26.2%	15.8%		
2007	Number	114,594	52,987	33,397	200,978	8,728
	Percentage	57%	26.4%	16.6%		
2006	Number	103,066	49,711	31,145	183,922	12,879
	Percentage	56%	27%	17%		
2005	Number	79,865	45,273	27,869	153,007	15,734
	Percentage	52.2%	29.6%	18.2%		
2004	Number	58,377	35,796	22,199	116,472	19,182
	Percentage	50.1%	30.7%	19.1%		

Table 21 Mean HbA_{1c} recorded in previous 15 months for people with type 1 diabetes (in 8 age categories and type 2 diabetes (all ages))

NHS Board	Type 1 Diabetes								Type 2 Diabetes
	Age 0-4	Age 5-9	Age 10-14	Age 15-19	Age 20-24	Age 25-29	Age 30-39	Age ≥40	All ages
Ayrshire & Arran	9.1	8.8	8.9	9	9.6	8.5	8.6	8.5	7.3
Borders	0	9.0	9.0	9.5	9.7	9.4	8.8	8.5	7.4
Dumfries & Galloway	0	8.2	9.3	10.1	9.7	8.6	8.9	8.3	7.3
Fife	7.6	8.4	8.6	9.7	9.3	8.4	8.5	8.4	7.2
Forth Valley	9.3	8.8	9.3	10.3	9.7	9.2	8.6	8.6	7.4
Grampian	8.5	8.7	9.2	9.8	9.6	9.1	8.8	8.8	7.5
Greater Glasgow & Clyde	8.0	8.1	8.5	9.6	9.1	8.8	8.7	8.6	7.5
Highland	0	8.8	9.2	9.6	9.6	8.9	8.8	8.4	7.5
Lanarkshire	8.8	8.4	9.0	9.6	9.4	8.7	8.8	8.5	7.3
Lothian	8.9	8.8	9.0	9.3	9.2	8.6	8.4	8.3	7.3
Orkney	0	7.5	8.7	10.0	9.1	7.6	7.8	8.1	7.2
Shetland	8.3	8.7	8.9	9.7	8.9	8.5	7.9	8.2	7.1
Tayside	8.2	8.6	9.3	10.0	9.4	8.9	8.8	8.5	7.4
Western Isles	9.8	8.9	8.5	9.6	9.7	9.0	8.6	8.5	7.4

Insulin Pump Usage

Table 22 Number of people with Type 1 diabetes on continuous subcutaneous insulin infusion (CSII or insulin pumps) as a percentage of all those with type 1 diabetes

NHS Board	Type 1 Population	Number of patients	%
Ayrshire & Arran	2,234	9	0.4%
Borders	596	23	3.9%
Dumfries & Galloway	871	12	1.4%
Fife	1,896	83	4.4%
Forth Valley	1,526	24	1.6%
Grampian	2,976	59	2.0%
Greater Glasgow & Clyde	5,923	56	0.9%
Highland	1,688	19	1.1%
Lanarkshire	3,454	38	1.1%
Lothian	4,019	142	3.5%
Orkney	118	3	2.5%
Shetland	114	2	1.8%
Tayside	1,771	82	4.6%
Western Isles	181	1	0.6%
Scotland	**27,367**	**553**	**2.0%**

Cardiovascular Risk

Diabetes is associated with an increased risk of cardiovascular disease and it is therefore important to address cardiovascular risk factors such as blood pressure (BP), cholesterol and smoking.

Blood Pressure

93.9% of diabetic patients had their BP recorded within the previous 15 months, of which 75.1% had a systolic BP less than of equal to 140mmHg, suggesting reasonable control of blood pressure. However, this target level is under review.

Figure 10 Percentage of patients with a recording of BP in previous 15 months (type 1 and type 2)

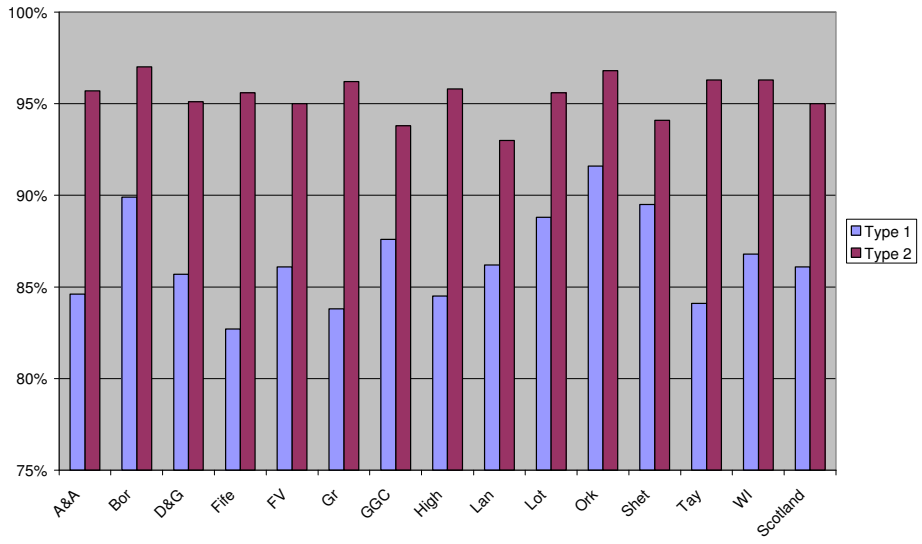


Table 23 Recording of BP within previous 15 months 2002-2009 (T1 and T2)

Year	Measured within previous 15 months	Total
2009	**93.9%**	**226,631**
2008	90.8%	219,963
2007	89.7%	209,706
2006	88.9%	196,801
2005	84.3%	172,699
2004	77.7%	138,233
2003	51.6%	123,780
2002	66.8%	103,774

Figure 11a BP category as percentage of Type 1 patients with BP ≤ 140 mmHg recorded within previous 15 months

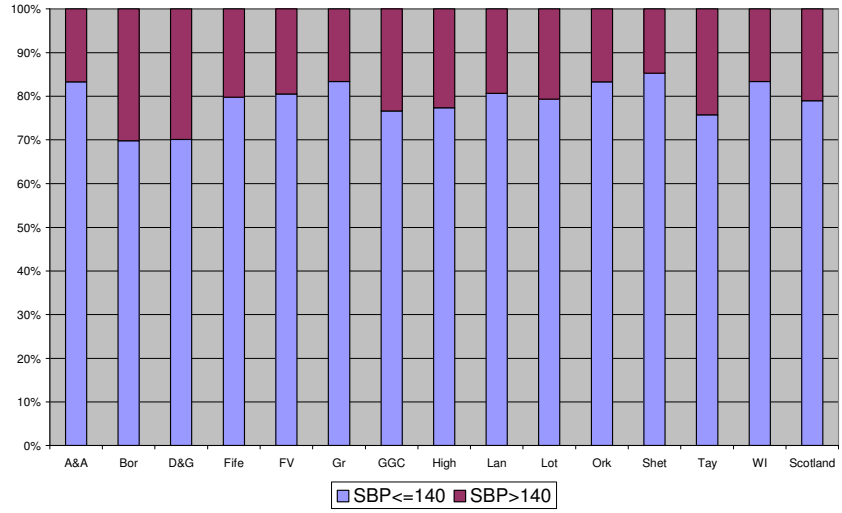


Figure 11b BP category as percentage of Type 1 patients with SBP ≤ 130 mmHg recorded within previous 15 months

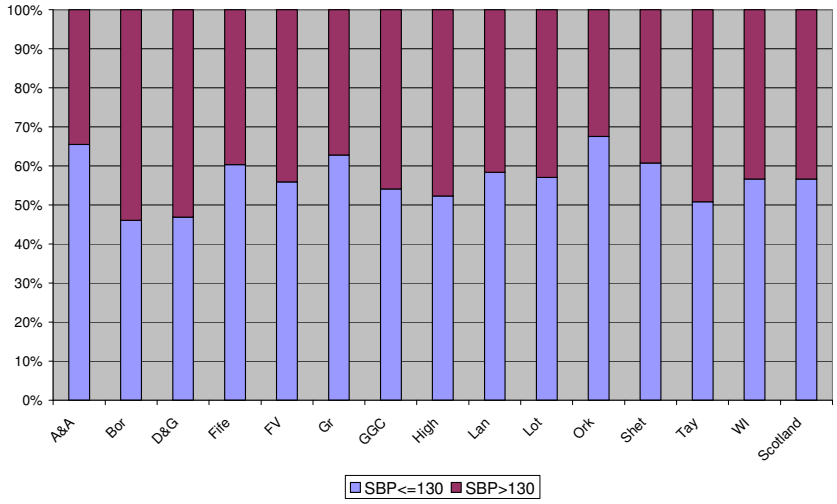


Figure 12a BP category as percentage of Type 2 patients with SBP ≤140 mmHg recorded within previous 15 months

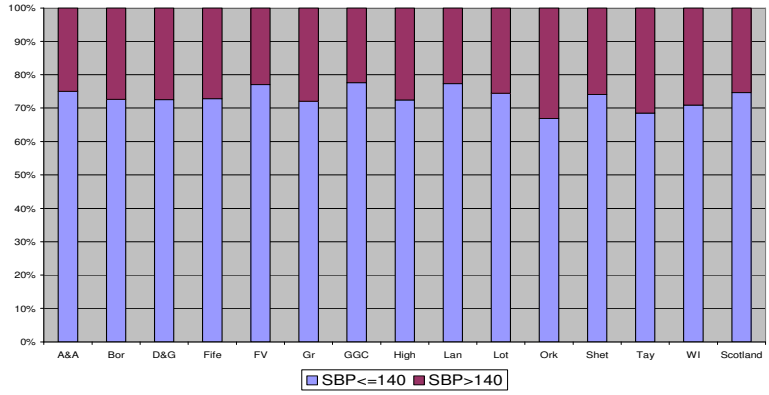


Figure 12b BP category as percentage of Type 2 patients with BP ≤ 130 mmHg recorded within previous 15 months

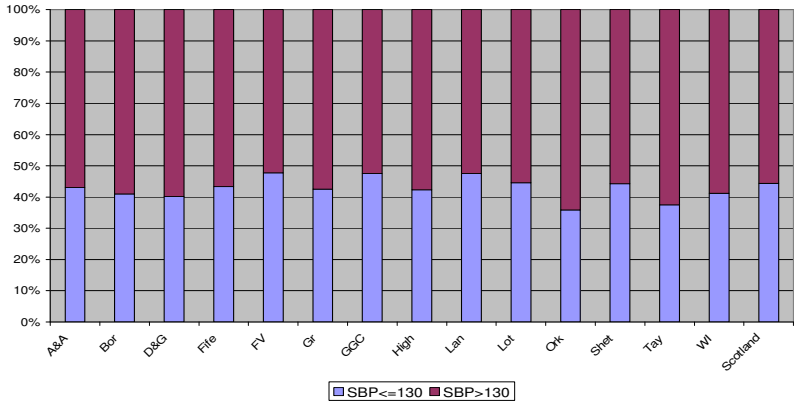


Table 24a Type 1 diabetes: BP category as percent of patients with SBP ≤ 140mmHg and > 140 mmHg recorded in previous 15 months

NHS Board	Systolic BP <=140		Systolic BP>140		Total recorded	Not recorded
Ayrshire & Arran	1575	83.3%	316	16.7%	1891	343
Borders	374	69.8%	162	30.2%	536	60
Dumfries & Galloway	529	70.1%	226	29.9%	755	126
Fife	1251	79.8%	317	20.2%	1568	328
Forth Valley	1057	80.5%	256	19.5%	1313	213
Grampian	2080	83.4%	415	16.6%	2495	481
Greater Glasgow & Clyde	3972	76.6%	1212	23.4%	5184	739
Highland	1104	77.4%	322	22.6%	1426	262
Lanarkshire	2401	80.7%	575	19.3%	2976	478
Lothian	2832	79.4%	736	20.6%	3568	451
Orkney	90	83.3%	18	16.7%	108	10
Shetland	87	85.3%	15	14.7%	102	12
Tayside	1128	75.8%	361	24.2%	1489	282
Western Isles	131	83.4%	26	16.6%	157	24
Scotland	**18611**	**79%**	**4957**	**21%**	**23568**	**3809**

Table 24b Type 1 diabetes: BP category as percent of patients with SBP≤ 130 mmHg and > 130 mmHg recorded in previous 15 months

NHS Board	Systolic BP <=130		Systolic BP>130		Total recorded	Not recorded
Ayrshire & Arran	1204	65.5%	687	34.5%	1891	343
Borders	247	46.1%	289	53.9%	536	60
Dumfries & Galloway	354	46.9%	401	53.1%	755	126
Fife	948	60.4%	620	39.6%	1568	328
Forth Valley	734	55.9%	579	44.1%	1313	213
Grampian	1566	62.8%	929	37.2%	2495	481
Greater Glasgow & Clyde	2805	54.1%	2379	45.9%	5184	739
Highland	746	52.3%	680	47.7%	1426	262
Lanarkshire	1738	58.4%	1238	41.6%	2976	478
Lothian	2037	57.1%	1531	42.9%	3568	451
Orkney	73	67.6%	35	32.4%	108	10
Shetland	62	60.8%	40	39.2%	102	12
Tayside	757	50.8%	732	49.2%	1489	282
Western Isles	89	56.7%	68	43.3%	157	24
Scotland	**13360**	**56.7%**	**10208**	**43.3%**	**23568**	**3809**

Table 25a Type 2 diabetes: BP category as percent of patients with SBP ≤ 140mmHg and > 140 mmHg recorded in previous 15 months

NHS Board	Systolic BP <=140		Systolic BP>140		Total recorded	Not recorded
Ayrshire & Arran	11313	75.0%	3767	25.0%	15080	674
Borders	3194	72.7%	1201	27.3%	4395	135
Dumfries & Galloway	4451	72.6%	1683	27.4%	6134	319
Fife	10259	72.9%	3805	27.1%	14064	654
Forth Valley	8457	77.1%	2506	22.9%	10963	580
Grampian	13424	72.1%	5202	27.9%	18626	735
Greater Glasgow & Clyde	33718	77.6%	9741	22.4%	43459	2886
Highland	7963	72.5%	3026	27.5%	10989	481
Lanarkshire	16408	77.4%	4798	22.6%	21206	1588
Lothian	19590	74.5%	6712	25.5%	26302	1204
Orkney	502	66.8%	249	33.1%	751	25
Shetland	552	74.1%	193	25.9%	745	47
Tayside	10732	68.5%	4939	31.5%	15671	612
Western Isles	641	70.9%	263	29.1%	904	35
Scotland	**141204**	**74.6%**	**48085**	**25.4%**	**189289**	**9975**

Table 25b Type 2 diabetes: BP category as percent of patients with SBP≤ 130 mmHg and > 130 mmHg recorded in previous 15 months

NHS Board	Systolic BP <=130		Systolic BP>130		Total recorded	Not recorded
Ayrshire & Arran	6488	43.0%	8592	57.0%	15080	674
Borders	1800	41.0%	2595	59.0%	4395	135
Dumfries & Galloway	2458	40.1%	3676	59.9%	6134	319
Fife	6101	43.3%	7963	56.7%	14064	654
Forth Valley	5235	47.8%	5728	52.2%	10963	580
Grampian	7910	42.5%	10716	57.5%	18626	735
Greater Glasgow & Clyde	20661	47.5%	22798	52.5%	43459	2886
Highland	4645	42.3%	6344	57.7%	10989	481
Lanarkshire	10080	47.5%	11126	52.5%	21206	1588
Lothian	11731	44.6%	14571	55.4%	26302	1204
Orkney	269	35.8%	482	64.2%	751	25
Shetland	330	44.3%	415	55.7%	745	47
Tayside	5871	37.5%	9800	62.5%	15671	612
Western Isles	372	41.2%	532	58.8%	904	35
Scotland	**83951**	**44.4%**	**105338**	**55.6%**	**189289**	**9975**

Table 26 BP category 2004-2009(as percentage of patients with BP recorded)

Year	Systolic BP ≤140		Systolic BP >140		Total	Not recorded
2009	**159,815**	**75.1%**	**53,042**	**24.9%**	**212,857**	**13,774**
2008	146,452	73.4%	53,198	26.7%	199,650	20,313
2007	149,038	73.0%	55,128	27.0%	204,166	5,540
2006	133,898	71.1%	54,526	28.9%	188,424	8,377
2005	107,398	69.2%	47,871	30.8%	155,269	13,384
2004	76,729	62.7%	45,738	37.4%	122,467	12,104

Note: From 2008 onwards, there was a requirement that BP should be in previous 15 months. In 2004 to 2007, older results could be included if there was no recent result.

Table 27 Mean BP recorded in previous 15 months in people with type 1 diabetes aged <40 years

NHS Board	Mean systolic BP	Mean diastolic BP
Ayrshire & Arran	119	70
Borders	125	72
Dumfries & Galloway	127	78
Fife	122	73
Forth Valley	124	73
Grampian	120	71
Greater Glasgow & Clyde	125	73
Highland	124	74
Lanarkshire	121	74
Lothian	123	74
Orkney	118	72
Shetland	122	74
Tayside	126	74
Western Isles	120	73

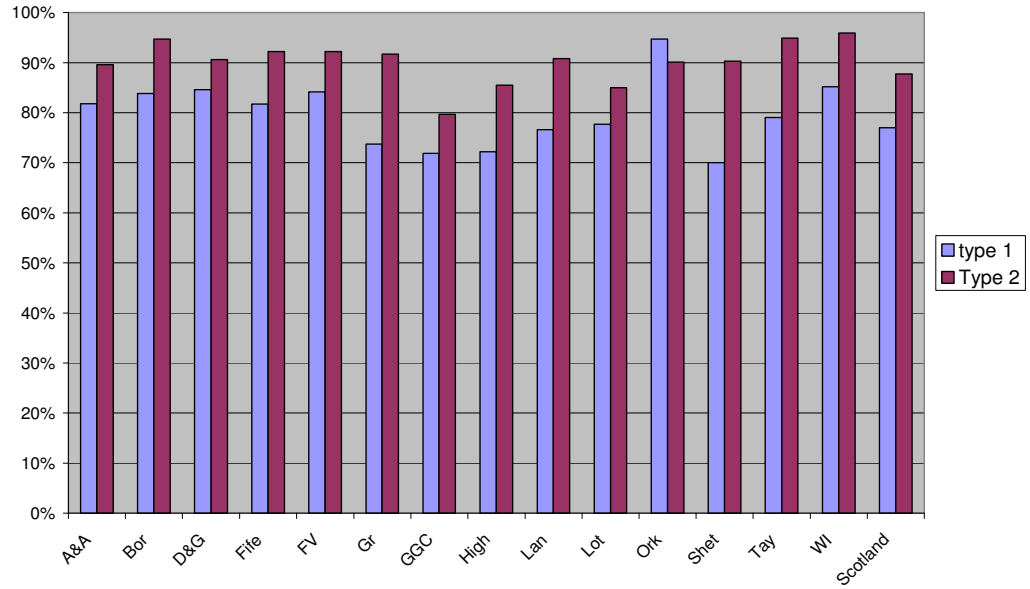
Table 28 Mean BP recorded in previous 15 months in people with type 2 diabetes aged 50-60 years by NHS board

NHS Board	Mean systolic BP	Mean diastolic BP
Ayrshire & Arran	133	78
Borders	133	77
Dumfries & Galloway	134	79
Fife	133	79
Forth Valley	131	77
Grampian	133	78
Greater Glasgow & Clyde	132	77
Highland	133	78
Lanarkshire	132	77
Lothian	132	78
Orkney	136	80
Shetland	135	80
Tayside	134	79
Western Isles	133	79

Cholesterol

Cholesterol was recorded in 86.5% of people with type 1 or type 2 diabetes within the previous 15 months. Total cholesterol was found to be less than or equal to the target of 5.0mmol/l in 80.7% of patients with a recorded result.

Figure 13 Recording of cholesterol in those with T1 and T2 diabetes within the previous 15 months



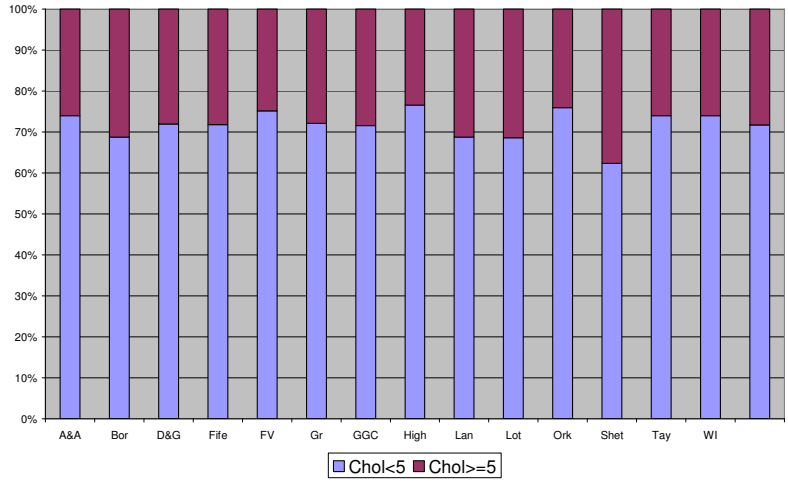
Note: Excludes children under 12 years (n=996)

Table 29 Recording of cholesterol within the previous 15 months 2002-2009 (all diabetes)

Year	Recorded within previous 15 months	Total
2009	**86.5%**	**225,635**
2008	90.1%	218,903
2007	88.4%	208,652
2006	85.5%	195,717
2005	79.2%	171,899
2004	69.0%	149,353
2003	40.2%	133,889
2002	60.5%	102,837

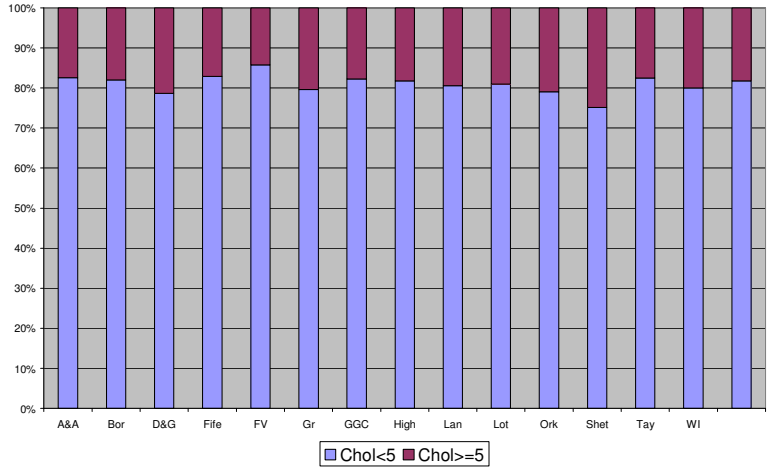
Note: Excludes children under 12 years of age (n=996). 2009 survey records only those with T1 and T2 diabetes

Figure 14 Type 1: Total cholesterol category recorded within previous 15 months as percentage of patients with total cholesterol recorded



Note: Excludes children under 12 years (n=986)

Figure 15 Type 2: Total cholesterol category recorded within previous 15 months as percentage of patients with total cholesterol recorded



Note: Excludes children under 12 years (n= 10)

Table 30 Type 1: Total cholesterol category by NHS board as percentage of patients with cholesterol recorded within the previous 15 months

NHS Board	Total cholesterol ≤5		Total cholesterol >5		Total recorded	Not recorded
Ayrshire & Arran	1295	74.0%	456	26.0%	1751	389
Borders	330	68.7%	150	31.3%	480	93
Dumfries & Galloway	511	71.9%	200	28.1%	711	130
Fife	1069	71.8%	419	28.2%	1488	332
Forth Valley	922	75.1%	306	24.9%	1228	232
Grampian	1528	72.1%	590	27.9%	2118	757
Greater Glasgow & Clyde	2938	71.5%	1172	28.5%	4110	1604
Highland	894	76.5%	274	23.5%	1168	450
Lanarkshire	1743	68.7%	794	31.3%	2537	778
Lothian	2084	68.6%	954	31.4%	3038	873
Orkney	82	75.9%	26	24.1%	108	6
Shetland	48	62.3%	29	37.7%	77	33
Tayside	1002	74.0%	352	26.0%	1354	360
Western Isles	111	74.0%	39	26.0%	150	26
Scotland	**14557**	**71.6%**	**5761**	**28.3%**	**20318**	**6063**

Note: Excludes children under 12 years of age (n=986)

Table 31 Type 2: Total cholesterol category by NHS board as percentage of patients with cholesterol recorded within the previous 15 months

NHS Board	Total cholesterol ≤5		Total cholesterol >5		Total recorded	Not recorded
Ayrshire & Arran	11653	82.6%	2459	17.4%	14112	1,641
Borders	3519	82.0%	771	18.0%	4290	238
Dumfries & Galloway	4599	78.7%	1248	21.3%	5847	606
Fife	11251	82.9%	2315	17.1%	13566	1,150
Forth Valley	9133	85.8%	1506	14.2%	10639	904
Grampian	14137	79.6%	3617	20.4%	17754	1,606
Greater Glasgow & Clyde	30398	82.3%	6534	17.7%	36932	9,411
Highland	8021	81.8%	1783	18.2%	9804	1,666
Lanarkshire	16685	80.6%	4004	19.4%	20689	2,104
Lothian	18933	81.0%	4437	19.0%	23370	4,135
Orkney	553	79.1%	146	20.9%	699	77
Shetland	537	75.1%	178	24.9%	715	77
Tayside	12738	82.5%	2711	17.5%	15449	834
Western Isles	720	80.0%	180	20.0%	900	39
Scotland	**142877**	**81.8%**	**31889**	**18.2%**	**174766**	**24,488**

Note: Excludes children under 12 years of age (n=10)

Table 32 Total cholesterol category 2004-2009 as percentage of diabetic population Type1 and Type2

Year	Cholesterol <=5		Cholesterol >5		Not known		Total
2009	**157,434**	**69.8%**	**37,650**	**16.7%**	**30,551**	**13.5%**	**225,635**
2008	157,938	72.1%	39,107	17.9%	21,858	10.0%	218,903
2007	159,843	76.6%	40,552	19.4%	8,257	4.0%	208,652
2006	143,999	73.6%	38,614	19.7%	13,104	6.7%	195,717
2005	113,542	67.6%	37,631	22.4%	16,680	9.9%	167,853
2004	78,688	54.0%	39.051	26,8%	27,952	19.2%	145,691

Note: From 2008 onwards, there was a requirement that cholesterol should be in previous 15 months. In 2004 to 2007, older results could be included if there was no recent result.
Excludes children under 12 years of age (n=996)

Table 33 Mean total cholesterol in people with type 2 diabetes aged 50-60 years by NHS board

NHS Board	Mean total cholesterol (mmol/l)
Ayrshire & Arran	4.5
Borders	4.6
Dumfries & Galloway	4.6
Fife	4.4
Forth Valley	4.2
Grampian	4.6
Greater Glasgow & Clyde	4.4
Highland	4.4
Lanarkshire	4.5
Lothian	4.5
Orkney	4.3
Shetland	4.5
Tayside	4.4
Western Isles	4.4

Smoking status

Smoking status was recorded for 98.9% of the diabetic population. Almost 1 in 5 people with diabetes were recorded as being current smokers

Figure 16a Smoking status as a percentage of Type 1 diabetic population

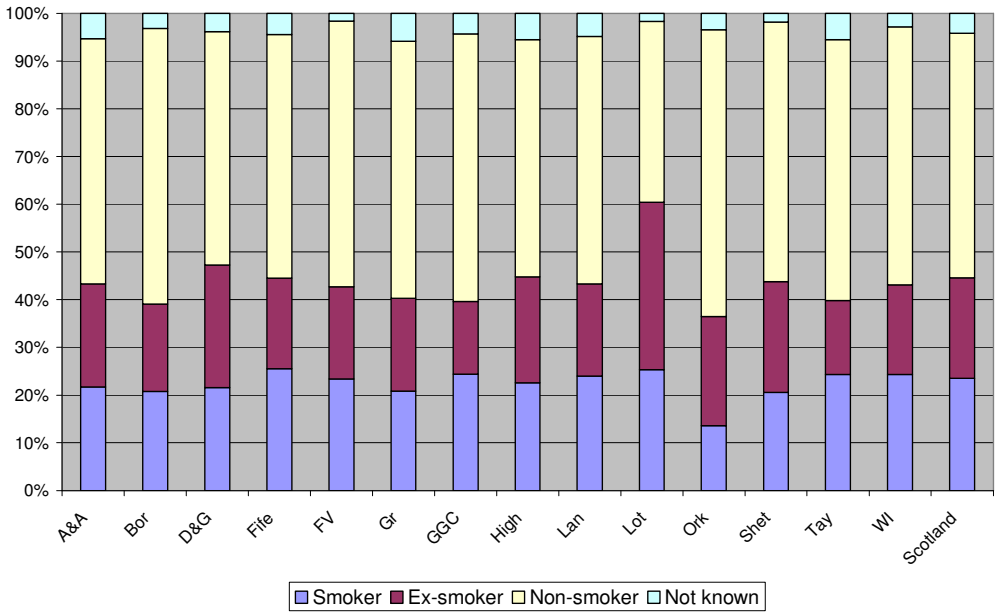


Figure 16b Smoking status as a percentage of Type 2 diabetic population

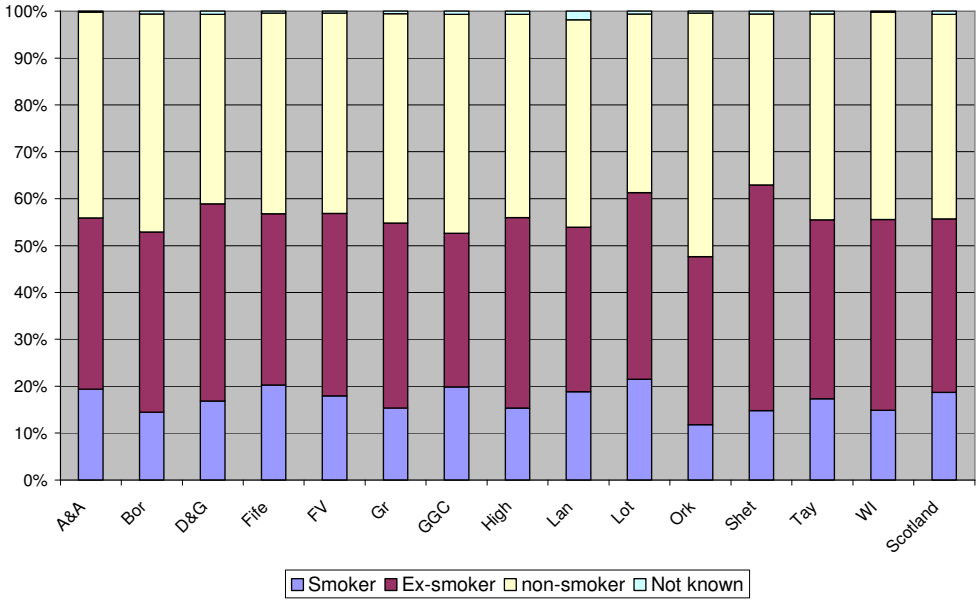


Table 34 Type 1: Smoking status by NHS board as percentage of patients with smoking status recorded

NHS Board	Current smoker	Ex-smoker	Never smoked	Total recorded	Not recorded
Ayrshire & Arran	22.9%	22.8%	54.3%	2116	118
Borders	21.5%	18.9%	59.6%	577	19
Dumfries & Galloway	22.5%	26.7%	50.8%	838	33
Fife	26.7%	19.9%	53.5%	1812	84
Forth Valley	23.8%	19.6%	56.6%	1502	24
Grampian	22.1%	20.7%	57.2%	2802	174
Greater Glasgow & Clyde	25.5%	15.9%	58.6%	5667	256
Highland	23.9%	23.5%	52.6%	1596	92
Lanarkshire	25.2%	20.3%	54.5%	3289	165
Lothian	25.7%	35.7%	38.6%	3950	69
Orkney	14.1%	23.7%	62.3%	114	4
Shetland	21.0%	23.7%	55.4%	112	2
Tayside	25.7%	16.4%	57.9%	1673	98
Western Isles	25.0%	19.3%	55.7%	176	5
Scotland	**24.6%**	**22.0%**	**53.5%**	**26224**	**1143**

Table 35 Type 2: Smoking status by NHS board as percentage of patients with smoking status recorded

NHS Board	Current smoker	Ex-smoker	Never smoked	Total recorded	Not recorded
Ayrshire & Arran	19.4%	36.6%	44.0%	15730	24
Borders	14.5%	38.7%	46.8%	4505	25
Dumfries & Galloway	17.0%	42.3%	40.7%	6405	48
Fife	20.3%	36.7%	43.0%	14663	55
Forth Valley	18.0%	39.0%	42.9%	11496	47
Grampian	15.4%	39.7%	44.9%	19268	93
Greater Glasgow & Clyde	20.0%	33.0%	47.0%	46002	343
Highland	15.4%	40.9%	43.6%	11391	79
Lanarkshire	19.2%	35.7%	45.1%	22351	443
Lothian	21.6%	40.0%	38.3%	27349	157
Orkney	11.8%	36.0%	52.2%	773	3
Shetland	14.9%	48.4%	36.7%	787	5
Tayside	17.4%	38.4%	44.2%	16182	101
Western Isles	14.9%	40.8%	44.3%	937	2
Scotland	**18.8%**	**37.3%**	**43.9%**	**197839**	**1425**

Table 36 Smoking status 2001-2009 as percentage of those with data recorded (Type 1 and Type 2)

Year	Current smoker	Ex-smoker	Never smoked	Not recorded
2009	**19.5%**	**35.5%**	**45.0%**	**2,568**
2008	19.2%	35.0%	44.0%	1.8%
2007	19.3%	34.0%	43.4%	3.3%
2006	19.0%	33.0%	41.8%	6.3%
2005	19.5%	30.0%	41.6%	8.9%
2004	19.2%	28.4%	40.5%	11.9%
2003	16.6%	21.6%	33.4%	28.5%
2002	16.2%	20.1%	36.3%	27.4%
2001	16.1%	15.7%	42.1%	26.1%

Note: Data for years 2001 to 2008 are calculated as a percentage of all registered patients

HbA1c, BP and cholesterol targets

The targets for HbA_{1c}, blood pressure and cholesterol will be reviewed in the light of updated NICE and SIGN guidelines. The proportions of patients known to be reaching current target levels for control of their blood glucose, blood pressure and cholesterol are shown below.

Figure 17 Percentage of patients reaching targets for HbA_{1c}, BP and total cholesterol by NHS Board – Type 1

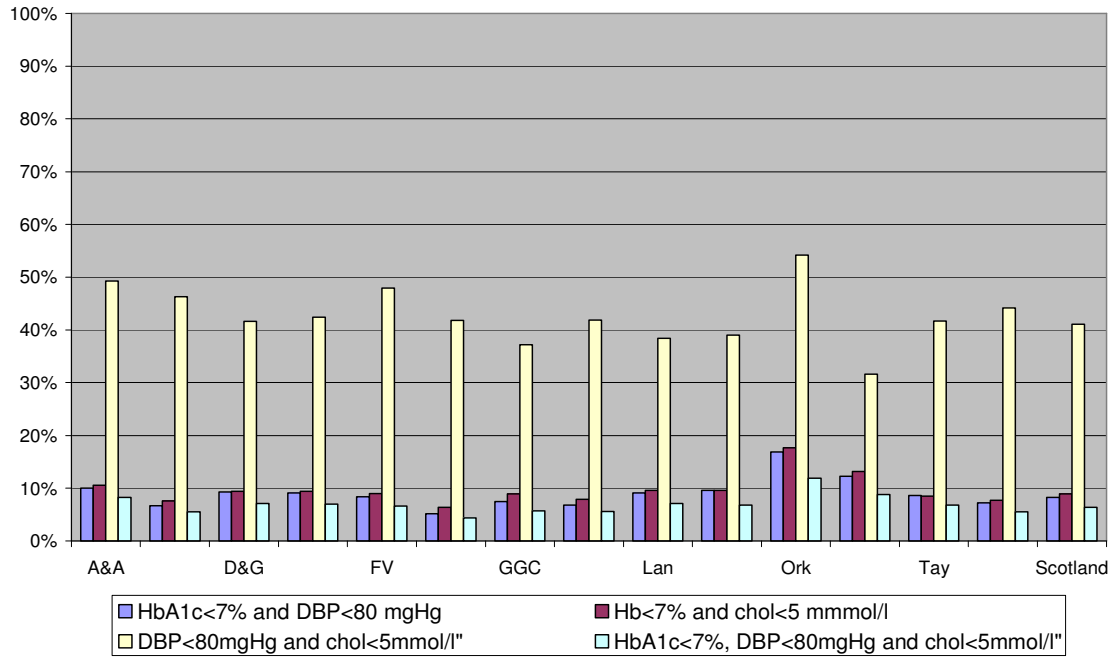


Figure 18 Percentage of patients reaching targets for HbA_{1c}, BP and total cholesterol by NHS board – Type 2

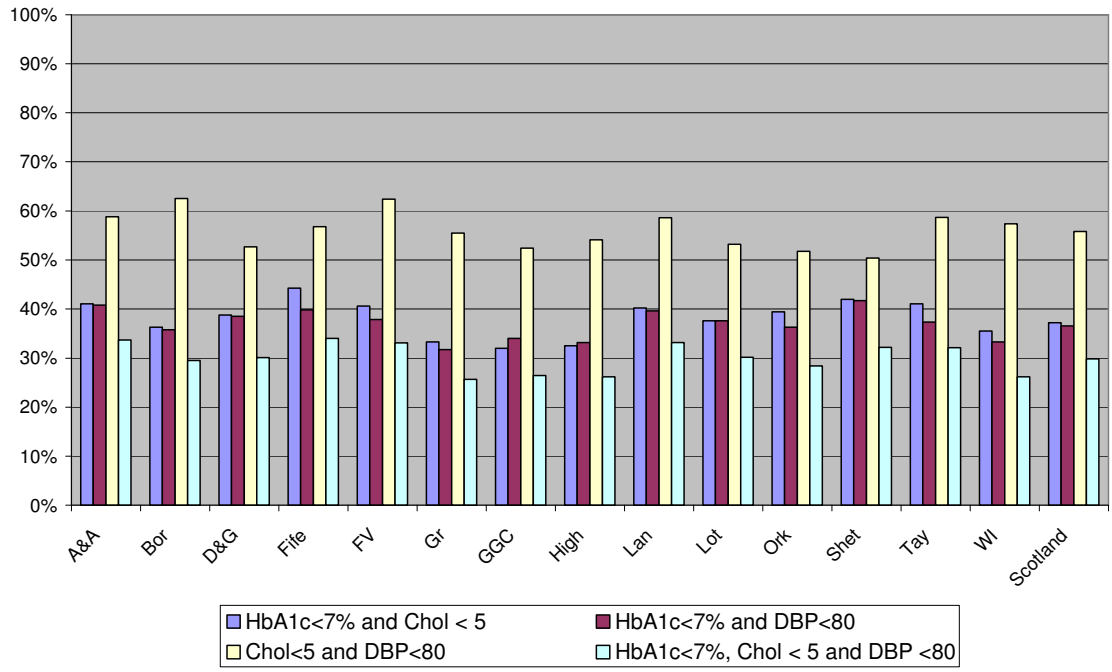


Figure 19 Percentage of patients reaching targets for HbA_{1c}, BP and total cholesterol Scotland wide – Type 2

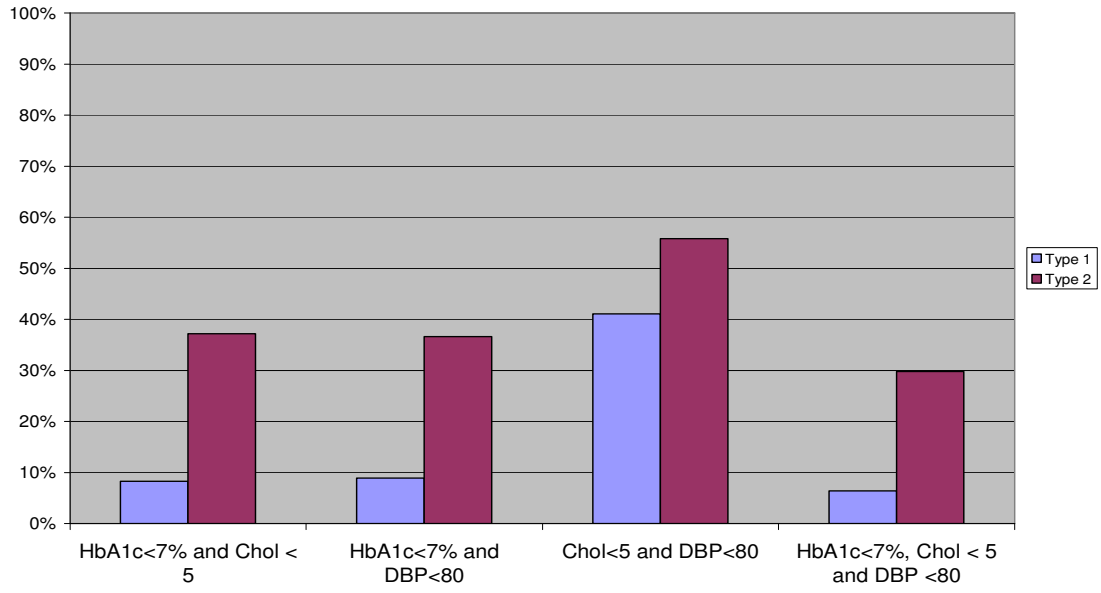


Table 37 Percentage of patients reaching targets for HbA_{1c}, BP and total cholesterol – Type 1

NHS Board	HbA1c<7% and Chol < 5		HbA1c<7% and DBP<80		Chol<5 and DBP<80		HbA1c<7%, Chol < 5 and DBP <80	
Ayrshire & Arran	224	10.0%	237	10.6%	1101	49.3%	186	8.3%
Borders	40	6.7%	45	7.6%	276	46.3%	33	5.5%
Dumfries & Galloway	81	9.3%	82	9.4%	362	41.6%	62	7.1%
Fife	172	9.1%	170	9.0%	804	42.4%	133	7.0%
Forth Valley	128	8.4%	137	9.0%	731	47.9%	100	6.6%
Grampian	156	5.2%	189	6.4%	1243	41.8%	131	4.4%
Greater Glasgow & Clyde	443	7.5%	526	8.9%	2204	37.2%	339	5.7%
Highland	114	6.8%	133	7.9%	708	41.9%	95	5.6%
Lanarkshire	315	9.1%	331	9.6%	1328	38.4%	245	7.1%
Lothian	385	9.6%	387	9.6%	1568	39.0%	273	6.8%
Orkney	20	16.9%	21	17.7%	64	54.2%	14	11.9%
Shetland	14	12.3%	15	13.2%	36	31.6%	10	8.8%
Tayside	153	8.6%	151	8.5%	739	41.7%	120	6.8%
Western Isles	13	7.2%	14	7.7%	80	44.2%	10	5.5%
Scotland	**2258**	**8.3%**	**2447**	**8.9%**	**11243**	**41.1%**	**1751**	**6.4%**

Table 38 Percentage of patients reaching targets for HbA_{1c}, BP and total cholesterol – Type 2

NHS Board	HbA1c<7% and Chol < 5		HbA1c<7% and DBP<80		Chol<5 and DBP<80		HbA1c<7%, Chol < 5 and DBP <80	
Ayrshire & Arran	6473	41.1%	6427	40.8%	9270	58.8%	5305	33.7%
Borders	1644	36.3%	1621	35.8%	2833	62.5%	1337	29.5%
Dumfries & Galloway	2501	38.8%	2487	38.5%	3399	52.7%	1944	30.1%
Fife	6523	44.3%	5862	39.8%	8364	56.8%	4999	34.0%
Forth Valley	4692	40.6%	4376	37.9%	7199	62.4%	3822	33.1%
Grampian	6449	33.3%	6138	31.7%	10748	55.5%	4973	25.7%
Greater Glasgow & Clyde	14852	32.0%	15765	34.0%	24293	52.4%	12254	26.4%
Highland	3731	32.5%	3813	33.2%	6210	54.1%	3007	26.2%
Lanarkshire	9172	40.2%	9018	39.6%	13348	58.6%	7579	33.2%
Lothian	10335	37.6%	10329	37.6%	14636	53.2%	8307	30.2%
Orkney	306	39.4%	282	36.3%	402	51.8%	220	28.4%
Shetland	333	42.0%	330	41.7%	399	50.4%	255	32.2%
Tayside	6685	41.1%	6071	37.3%	9555	58.7%	5227	32.1%
Western Isles	333	35.5%	313	33.3%	539	57.4%	246	26.2%
Scotland	**74029**	**37.2%**	**72832**	**36.6%**	**111195**	**55.8%**	**59475**	**29.8%**

Complications of diabetes

The main complications of diabetes include those due to large vessel (arterial) disease;

- myocardial infarction (MI) – the commonest cause of death in people with diabetes
- stroke – the risk is increased compared to people without diabetes
- peripheral vascular disease, which can lead to amputations

and those due to small vessel disease (microangiopathy);

- renal disease, which can lead to end-stage renal failure requiring dialysis
- retinopathy – diabetes has been the commonest cause of blindness in the people of working age

Diabetes also leads to poorer outcomes in pregnancy, but this survey does not include pregnancy outcomes.

In this section, the data presented include both screening performance and recording of prevalent complications. The purpose of screening is to detect changes early and intervene to prevent further deterioration.

Myocardial infarction

21471 (9.5%) of registered patients have a record of a previous MI. Others will have had an MI but not survived. Validation of this data is needed. There have been improvements in recording, increased use of procedures and better survival following an MI in recent years.

Table 39 Percentage of patients recorded as ever having had a myocardial infarct and survived by NHS board

NHS Board	Recorded as having had an MI			
	Type 1		Type 2	
Ayrshire & Arran	110	4.9%	1587	10.5%
Borders	30	5.0%	451	10.0%
Dumfries & Galloway	35	4.0%	534	8.3%
Fife	64	3.4%	1468	10.0%
Forth Valley	56	3.7%	1235	10.7%
Grampian	115	3.9%	1927	10.0%
Greater Glasgow & Clyde	196	3.3%	4808	10.4%
Highland	62	3.7%	1136	9.9%
Lanarkshire	171	5.0%	2371	10.4%
Lothian	108	2.7%	2791	10.1%
Orkney	7	5.9%	70	9.0%
Shetland	<5	1.8%	52	6.6%
Tayside	63	3.6%	1917	11.8%
Western Isles	7	3.9%	98	10.4%
Scotland	**1026**	**3.7%**	**20445**	**10.3%**

Note: these data are as reported and have not been validated.

Table 40 Percentage of patients recorded as ever having had a myocardial infarct 2001-2009 (T1 and T2) and survived

Year of Survey	Myocardial infarct
2009	**9.5%**
2008	9.5%
2007	9.5%
2006	9.4%
2005	8.6%
2004	7.3%
2003	7.7%
2002	8.1%
2001	6.7%

Note: this table shows the percentage of patients who have ever had a heart attack and survived.

Cardiac revascularisation

14320 (6.3%) people included in the survey have undergone cardiac revascularisation.

Table 41 Cardiac revascularisation in type 1 and type 2

NHS Board	Recorded as having undergone cardiac revascularisation			
	Type 1		Type 2	
Ayrshire & Arran	67	3.0%	983	6.2%
Borders	13	2.2%	295	6.5%
Dumfries & Galloway	26	3.0%	347	5.4%
Fife	35	1.8%	865	5.9%
Forth Valley	34	2.2%	734	6.4%
Grampian	82	2.8%	1345	6.9%
Greater Glasgow & Clyde	149	2.5%	3482	8.0%
Highland	45	2.7%	726	6.3%
Lanarkshire	137	4.0%	1609	7.1%
Lothian	92	2.3%	1911	6.9%
Orkney	<5	2.5%	49	6.3%
Shetland	<5	0.9%	30	3.9%
Tayside	48	2.7%	1144	7.0%
Western Isles	<5	2.2%	64	6.8%
Scotland	**736**	**2.7%**	**13584**	**6.8%**

Table 42 Percentage of patients recorded as ever having had cardiac revascularisation 2001-2009

Year of Survey	Cardiac Revascularisation
2009	**6.3%**
2008	6.1%
2007	5.9%
2006	5.5%
2005	4.9%
2004	3.9%
2003	2.8%
2002	3.7%
2001	2.1%

Stroke

11575 (5.1%) people with diabetes are recorded as having had a cerebrovascular accident (stroke), an increase in numbers but a similar percentage to that in previous surveys.

Table 43 Recorded as having had a stroke and survived

NHS Board	Recorded as having had a stroke			
	Type 1 diabetes		Type 2 diabetes	
Ayrshire & Arran	64	2.9%	801	5.1%
Borders	12	2.0%	299	6.6%
Dumfries & Galloway	23	2.6%	270	4.2%
Fife	39	2.1%	822	5.6%
Forth Valley	35	2.3%	621	5.4%
Grampian	42	1.4%	897	4.6%
Greater Glasgow & Clyde	115	1.9%	2706	5.8%
Highland	40	2.4%	567	4.9%
Lanarkshire	82	2.4%	1194	5.2%
Lothian	81	2.0%	1692	6.2%
Orkney	<5	0.8%	27	3.5%
Shetland	<5	2.6%	32	4.0%
Tayside	35	2.0%	1028	6.3%
Western Isles	<5	1.7%	44	4.7%
Scotland	**575**	**2.1%**	**11000**	**5.5%**

Kidney Disease

Serum creatinine

Serum creatinine was recorded for 90.0% of patients.

Table 44 Recording of serum creatinine within the previous 15 months by NHS board

NHS Board	Type 1 Diabetes		Type 2 Diabetes		Total
	Recorded within previous 15 months				
Ayrshire & Arran	1823	85.2%	14329	91.0%	16152
Borders	492	85.9%	4058	89.6%	4550
Dumfries & Galloway	717	85.3%	5714	88.5%	6431
Fife	1532	84.2%	13650	92.8%	15182
Forth Valley	1254	85.9%	10800	93.6%	12054
Grampian	2235	77.7%	18256	94.3%	20491
Greater Glasgow & Clyde	4468	78.2%	40815	88.1%	45283
Highland	1219	75.3%	10246	89.3%	11465
Lanarkshire	2618	79.0%	21030	92.3%	23648
Lothian	3095	79.1%	24654	89.6%	27749
Orkney	101	88.6%	692	89.2%	793
Shetland	80	72.7%	739	93.3%	819
Tayside	1500	87.5%	15790	97.0%	17290
Western Isles	160	90.9%	923	98.3%	1083
Scotland	**21294**	**80.7%**	**181696**	**91.2%**	**202990**

Note: Excludes children under 12 years of age (n=996)

Table 45 Recording of serum creatinine within the previous 15 months 2002-2009 (Type 1 and Type 2 diabetes)

Year	Recorded within previous 15 months	Total eligible population
2009*	**90.0%**	**225,635**
2008	90.3%	218,903
2007	88.6%	208,652
2006	86.1%	195,717
2005	82.3%	171,899
2004	69.2%	149,353
2003	42.5%	133,889
2002	63.5%	97,246

Note: Excludes children under 12 years of age (n=996)
*Figures prior to 2009 reported on those with all types of diabetes mellitus. The 2009 figures report only on those with type 1 and type 2 diabetes.

Urinary microalbuminuria

In 2007, the data showed that 80% of patients had urinary microalbuminuria checked within the previous 15 months. In 2008, the SCI-DC data recorded that only 41% of patients have had microalbuminuria checked. The decrease is due to a change to the guidance regarding data collection and analysis. In previous years, it was sufficient that a protein dipstick test had been done. From 2008 onwards, a value is required. The figures for microalbuminuria therefore under-estimate numbers tested. For example, according to SCI-DC, 25% of patients in Forth Valley have had microalbuminuria recorded in the previous 15 months, but the MCN's own data suggest a figure of 71%

Table 46 Recording of urinary microalbumin value available on SCI-DC within the previous 15 months by NHS board for T1 and T2

NHS Board	Type 1 Diabetes		Type 2 Diabetes		Total
	Recorded within previous 15 months				
Ayrshire & Arran	968	45.2%	3007	19.1%	3975
Borders	359	62.7%	73	1.6%	432
Dumfries & Galloway	148	17.6%	949	14.7%	1097
Fife	950	52.2%	4535	30.8%	5485
Forth Valley	647	44.3%	1895	16.4%	2542
Grampian	1443	50.2%	14670	75.8%	16113
Greater Glasgow & Clyde	2858	50.0%	14463	31.2%	17321
Highland	1026	63.4%	9264	80.8%	10290
Lanarkshire	1066	32.2%	3772	16.5%	4838
Lothian	1771	45.3%	7949	28.9%	9720
Orkney	58	50.9%	363	47.8%	421
Shetland	<5	0.9%	<5	0.4%	<5
Tayside	1003	58.5%	11776	72.3%	12779
Western Isles	128	72.7%	758	80.7%	886
Scotland	**12426**	**47.1%**	**73477**	**36.9%**	**85903**

Note: Excludes children under 12 years of age (n=996)

eGFR

It was agreed by the Survey Monitoring Group that eGFR results would not be reported because of problems with data linkage. The direct link between SCI Store the national information repository that stores test results and SCI-DC has been implemented in the Western Isles NHS Board which has proportionally the best recording of eGFR results

End stage renal failure

End stage renal failure implies a need for renal dialysis or transplantation.

Table 47 End stage renal failure by NHS board

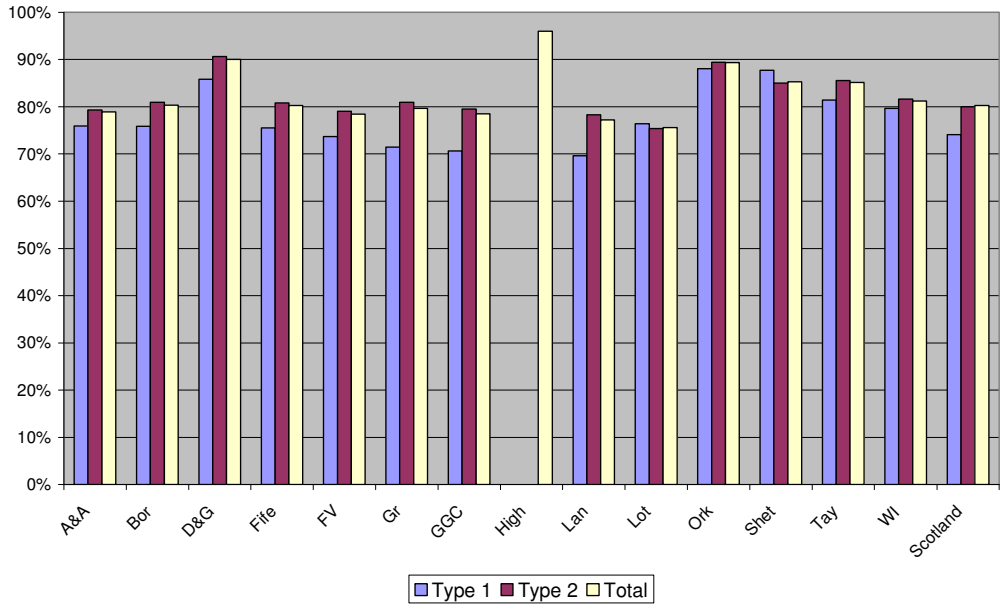
NHS Board	Type 1 Diabetes		Type 2 Diabetes	
	Recorded as having end stage renal failure			
Ayrshire & Arran	27	1.2%	31	0.2%
Borders	5	0.8%	34	0.8%
Dumfries & Galloway	7	0.8%	8	0.1%
Fife	19	1.0%	67	0.5%
Forth Valley	13	0.9%	32	0.3%
Grampian	<5	0.1%	108	0.6%
Greater Glasgow & Clyde	51	0.9%	155	0.3%
Highland	21	1.2%	48	0.4%
Lanarkshire	31	0.9%	74	0.3%
Lothian	45	1.1%	200	0.7%
Orkney	<5	2.5%	<5	0.1%
Shetland	<5	0.9%	<5	0.3%
Tayside	28	1.6%	107	0.7%
Western Isles	0	0%	5	0.5%
Scotland	**254**	**0.9%**	**872**	**0.4%**

Diabetic Eye Disease

Diabetic retinal screening

Retinal screening data for all Boards except Highland were collected through SCI-DC. Highland submitted data directly from Soarian, the retinal screening software, which was unable to distinguish between different categories of diabetes. Highland's data has therefore been excluded from the Type 1 and Type 2 tables and figures but have been included where possible in the Scotland figures. 80.6% of patients had a record of eye screening through the retinal screening service recorded on SCI-DC in the previous 15 months, including those attending ophthalmology services. More exploratory work on data accuracy needs to be carried out.

Figure 20 Recording of diabetic retinopathy screening within the previous 15 months through retinal screening service including those attending ophthalmology clinics.



Note: Excludes children under 12 years (n=996)

Table 48 Recording of diabetic retinopathy screening within the previous 15 months through retinal screening service (T1 and T2) including those attending ophthalmology clinics

NHS Board	Type 1 Diabetes		Type 2 Diabetes		Total screened		Excluded	Not recorded
	Screened within previous 15 months							
Ayrshire & Arran	1696	79.3%	12496	79.3%	14192	79.3%	83	3618
Borders	452	78.9%	3663	80.9%	4115	80.7%	109	877
Dumfries & Galloway	747	88.8%	5845	90.6%	6592	90.4%	163	539
Fife	1432	78.7%	11887	80.8%	13319	80.5%	301	2916
Forth Valley	1124	77.0%	9123	79.0%	10247	78.8%	284	2472
Grampian	2124	73.9%	15665	80.9%	17789	80.0%	529	3917
Greater Glasgow & Clyde	4179	73.1%	36834	79.5%	41013	78.8%	1,565	9479
Highland	n/a			n/a	12633	96.5%	316	139
Lanarkshire	2404	72.5%	17850	78.3%	20254	77.6%	1,385	4469
Lothian	3072	78.5%	20746	75.4%	23818	75.8%	993	6605
Orkney	104	91.2%	694	89.4%	798	89.7%	36	56
Shetland	100	90.9%	673	85.0%	773	85.7%	57	72
Tayside	1442	84.1%	13919	85.5%	15361	85.4%	363	2273
Western Isles	144	81.8%	766	81.6%	910	81.6%	16	189
Scotland	**19020a**	**76.8%**	**150161a**	**80.0%**	**181814**	**80.6%**	**6200**	**37621**

Note: Excludes children under 12 years (n=996). a) excludes Highland's data for Type 1 and Type 2 diabetes

Table 49 Recording of diabetic retinopathy screening 2001-2009 (T1 and T2)

Year	Recorded within previous 15 months	Not recorded
2009	**80.6%**	**19.8%**
2008	71.9%	28.1%
2007	83.6%	16.4%
2006	70.8%	29.2%
2005	67.7%	32.2%
2004	60.4%	39.6%
2003	40.4%	59.6%
2002	60.3%	39.7%
2001	42.2%	57.8%

Note: Excludes children under 12 years (n=996). 2008 data is taken only from digital imaging via Diabetes Retinopathy Screening. For 2001 to 2007, data from any form of screening was acceptable.

Diabetic retinopathy

20.6% of people with data available have retinopathy present in one or both of their eyes. However, for 28.2% of patients, the register did not include a record of retinopathy status.

Table 50 Type 1: Diabetic retinopathy present – left or right eye by NHS board (percentage of patients with a recorded result in the previous 15 months)

NHS Board	Present		Absent		Attends Ophthalmology clinic		Excluded	Not known
Ayrshire & Arran	804	47.5%	459	27.1%	428	25.3%	14	435
Borders	124	27.8%	166	37.2%	156	35.0%	14	113
Dumfries & Galloway	461	61.9%	104	14.0%	180	24.1%	20	76
Fife	500	35.5%	530	37.6%	380	27.0%	35	375
Forth Valley	545	49.0%	360	32.3%	209	18.8%	35	311
Grampian	1036	49.0%	822	38.9%	255	12.1%	50	712
Greater Glasgow and Clyde	1643	39.5%	1772	42.6%	749	18.0%	164	1386
Highland	n/a		n/a		n/a		n/a	n/a
Lanark	1052	43.8%	976	40.6%	373	15.5%	175	739
Lothian	1056	34.5%	1242	40.6%	762	24.9%	93	758
Orkney	36	34.6%	40	38.5%	28	26.9%	0	10
Shetland	39	39.0%	34	34.0%	27	27.0%	5	5
Tayside	370	25.7%	554	38.4%	517	35.9%	19	254
Western Isles	45	31.3%	61	42.4%	38	26.4%	0	32
Scotland	**7711**	**43.3%**	**7120**	**33.7%**	**4102**	**23.0%**	**624**	**5206**

Note: Excludes children under 12 years (n=986).

Table 51 Type 2: Diabetic retinopathy present – left or right eye by NHS board (percentage of patients with a recorded result in the previous 15 months)

NHS Board	Present		Absent		Attends Ophthalmology clinic		Excluded	Not known
Ayrshire & Arran	3714	29.9%	7703	61.9%	1021	8.2%	69	3246
Borders	607	17.0%	2302	64.3%	669	18.7%	95	855
Dumfries & Galloway	3663	62.8%	1710	29.3%	462	7.9%	143	475
Fife	2360	20.4%	8245	71.2%	980	8.4%	266	2865
Forth Valley	2463	28.1%	5535	63.1%	769	8.8%	249	2527
Grampian	4135	26.9%	10776	70.1%	451	2.9%	479	3519
Greater Glasgow and Clyde	7398	20.3%	26320	72.2%	2730	7.5%	1401	8494
Highland	n/a		n/a		n/a		n/a	n/a
Lanark	4078	23.1%	12546	71%	1040	5.9%	1210	3919
Lothian	3812	19.0%	13882	69.3%	2346	11.7%	900	6565
Orkney	113	16.4%	437	63.3%	140	20.3%	36	50
Shetland	172	25.9%	420	63.3%	71	10.7%	52	77
Tayside	2462	17.9%	8816	64.1%	2482	18.0%	344	2179
Western Isles	153	20.8%	528	71.6%	56	7.6%	16	186
Scotland	**35130**	**23.8%**	**99220**	**67.2%**	**13217**	**9.0%**	**5260**	**34957**

Note: Excludes children under 12 years (n=10).

Table 52 Diabetic retinopathy present – left or right eye by NHS board (percentage of patients with a recorded result in the previous 15 months) - Type 1 and Type 2

NHS Board	Present		Absent		Attends Ophthalmology clinic		Excluded	Not known
Ayrshire & Arran	4518	32.0%	8162	57.8%	1449	10.2%	83	3681
Borders	731	18.2%	2468	61.3%	825	20.5%	109	968
Dumfries & Galloway	4124	62.7%	1814	27.6%	642	9.8%	163	551
Fife	2860	22.0%	8775	67.5%	1360	14.5%	301	3240
Forth Valley	3008	30.4%	5895	59.7%	978	9.9%	284	2838
Grampian	5171	29.6%	11598	66.4%	706	4.0%	529	4231
Greater Glasgow and Clyde	9041	22.3%	28092	69.2%	3479	8.5%	1565	9880
Highland	3667	29.1%	7401	58.7%	1536	12.2%	386	98
Lanark	5130	25.6%	13522	67.4%	1413	7.0%	1385	4658
Lothian	4868	21.1%	15124	65.5%	3108	13.4%	993	7323
Orkney	149	18.8%	477	60.1%	168	21.1%	36	60
Shetland	211	27.7%	454	59.5%	98	12.8%	57	82
Tayside	2832	18.6%	9370	61.6%	2999	19.8%	363	2433
Western Isles	198	22.5%	589	66.8%	94	10.7%	16	218
Scotland	**46508**	**26.0%**	**113741**	**63.5%**	**17319**	**10.5%**	**6270**	**40261**

Table 53 Diabetic retinopathy present – left or right eye 2003-2009 (percentage of total diabetic population)

Year	Present	Absent	Not known (includes those attending ophthalmology and suspensions)
2009	**20.4%**	**50.1%**	**29.5%**
2008	20.4%	48.8%	30.8%
2007	28.7%	53.1%	18.2%
2006	19.5%	44.8%	35.7%
2005	13.2%	47.8%	39.0%
2004	14.5%	53.8%	31.7%
2003	14.3%	50.9%	34.6%

Note: Excludes children under 12 years (n=996). From 2008 onwards, there was a requirement that result should be in previous 15 months. In 2004 to 2007, older results could be included if there was no recent result.

Blindness

1,824 (0.8%) people with diabetes were recorded as blind in 2009. However, not all of these patients lost their sight through diabetic complications. This reflects the combination of improvements in diabetes control (so less retinopathy), and the effect of screening, early detection and laser treatment to preserve vision.

Table 54 Type 1: Recorded as blind for Scotland

NHS Board	Blind - diabetic cause		Blind - non-diabetic cause		Blind - not specified		Total		Total on Register
Scotland	**43**	**0.2%**	**10**	**0.04%**	**147**	**0.5%**	**200**	**0.7%**	**27367**

Table 55 Type 2: Recorded as blind by NHS board

NHS Board	Blind - diabetic cause		Blind - non-diabetic cause		Blind - not specified		Total		Total on Register
Ayrshire & Arran	<5	0.0%	<5	0.0%	98	0.6%	106	0.7%	15754
Borders	0	0	0	0	43	0.9%	43	0.9%	4530
Dumfries & Galloway	2	0.0%	<5	0.0%	34	0.5%	39	0.6%	6453
Fife	9	0.1%	<5	0.0%	78	0.5%	91	0.6%	14718
Forth Valley	<5	0.0%	13	0.1%	52	0.5%	68	0.6%	11543
Grampian	0	0	<5	0.0%	137	0.7%	140	0.7%	19361
Greater Glasgow & Clyde	15	0.0%	38	0.1%	339	0.7%	392	0.8%	46345
Highland	<5	0.0%	5	0.0%	89	0.8%	97	0.8%	11470
Lanarkshire	14	0.1%	17	0.1%	186	0.8%	217	1.0%	22794
Lothian	6	0.0%	39	0.1%	214	0.8%	259	0.9%	27506
Orkney	0	0	0	0	5	0.6%	5	0.6%	776
Shetland	0	0	<5	0.1%	7	0.9%	8	1.0%	792
Tayside	14	0.1%	23	0.1%	115	0.7%	152	0.9%	16283
Western Isles	<5	0.1%	0	0	6	0.6%	7	0.7%	939
Scotland	**71**	**0.0%**	**150**	**0.1%**	**1403**	**0.7%**	**1624**	**0.8%**	**199264**

Foot Complications

Peripheral pulses

76.5% of people with Type 1 or Type 2 diabetes have had their feet checked (peripheral pulses recorded) in the previous 15 months.

Figure 21 Percentage of people with Type 1 or Type 2 diabetes with peripheral pulses recorded within the previous 15 months

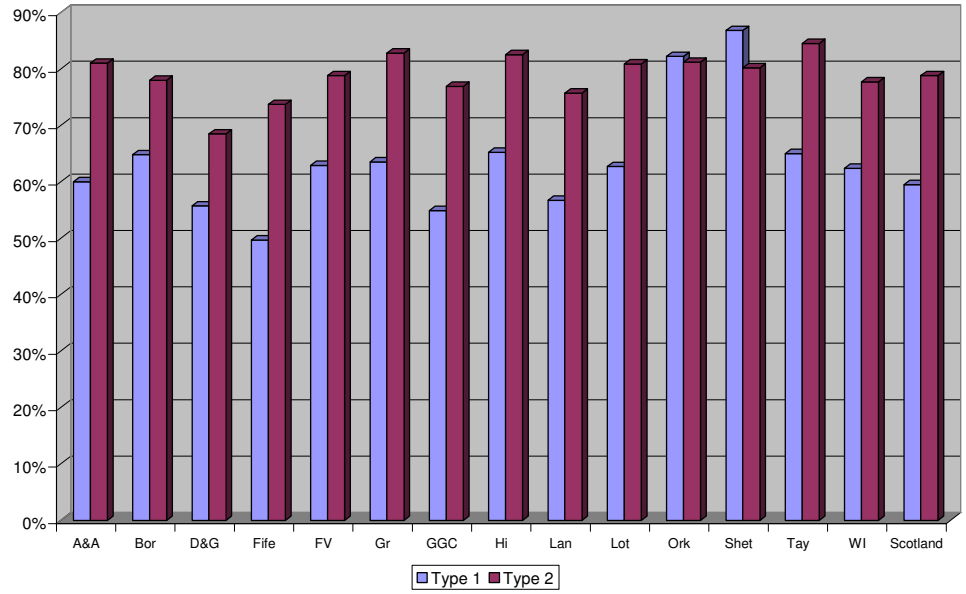


Table 56 Recording of peripheral pulses in T1 and T2 within the previous 15 months by NHS board

NHS Board	Type 1 Diabetes		Type 2 Diabetes	
	Recorded within previous 15 months			
Ayrshire & Arran	1339	59.9%	12757	81.0%
Borders	386	64.8%	3534	78.0%
Dumfries & Galloway	485	55.7%	4422	68.5%
Fife	942	49.7%	10851	73.7%
Forth Valley	960	62.9%	9095	78.8%
Grampian	1890	63.5%	16036	82.8%
Greater Glasgow & Clyde	3253	54.9%	35647	76.9%
Highland	1100	65.2%	9460	82.5%
Lanarkshire	1957	56.7%	17266	75.7%
Lothian	2521	62.7%	22247	80.9%
Orkney	97	82.2%	630	81.2%
Shetland	99	86.8%	635	80.2%
Tayside	1152	65.0%	13757	84.5%
Western Isles	113	62.4%	730	77.7%
Scotland	**16294**	**59.5%**	**157067**	**78.8%**

Table 57 Recording of peripheral pulses within the previous 15 months 2004-2009 (Type 1 and Type 2)

Year	Recorded within previous 15 months	Total
2009	**76.5%**	**226,631**
2008	76.1%	219,963
2007	74.5%	209,706
2006	73.9%	196,801
2005	66.9%	172,699
2004	55.2%	149,353

Foot ulceration

9735 (4.3%) people with Type 1 or Type 2 diabetes were reported to have had a foot ulcer.

Table 58 Recorded as ever having had a foot ulcer by NHS board

NHS Board	Type 1 Diabetes		Type 2 Diabetes	
	Recorded as ever having had a foot ulcer			
Ayrshire & Arran	89	4.0%	212	1.3%
Borders	32	5.3%	104	2.3%
Dumfries & Galloway	19	2.2%	51	0.8%
Fife	139	7.3%	804	5.5%
Forth Valley	161	10.6%	549	4.8%
Grampian	49	1.6%	192	1.0%
Greater Glasgow & Clyde	363	6.1%	1418	3.1%
Highland	34	2.0%	162	1.4%
Lanarkshire	409	11.8%	1730	7.6%
Lothian	355	8.8%	2090	7.6%
Orkney	6	5.1%	9	1.2%
Shetland	0	0	<5	0.5%
Tayside	109	6.2%	610	3.7%
Western Isles	11	6.1%	24	2.6%
Scotland	**1776**	**6.5%**	**7959**	**4.0%**

Table 59 Recorded as ever having had a foot ulcer 2001-2009 (Type 1 and Type 2)

Year of Survey	Recorded as ever having had a foot ulcer
2009	**4.3%**
2008	4.6%
2007	4.7%
2006	5.0%
2005 (a)	3.9%
2004	2.2%
2003	1.5%
2002	1.4%
2001	1.0%

a Excludes Borders and Lanarkshire

Lower limb amputation

1132 (0.5%) patients have had a lower limb amputation.

Table 60 Recorded as ever having had a lower limb amputation

NHS Board	Type 1 Diabetes		Type 2 Diabetes	
	Recorded as ever having had a lower limb amputation			
Ayrshire & Arran	9	0.4%	52	0.3%
Borders	<5	0.5%	16	0.4%
Dumfries & Galloway	7	0.8%	31	0.5%
Fife	19	1.0%	75	0.5%
Forth Valley	9	0.6%	46	0.4%
Grampian	12	0.4%	63	0.3%
Greater Glasgow & Clyde	44	0.7%	226	0.5%
Highland	19	1.1%	73	0.6%
Lanarkshire	18	0.5%	80	0.4%
Lothian	21	0.5%	155	0.6%
Orkney	<5	2.5%	6	0.8%
Shetland	0	0	5	0.6%
Tayside	19	1.1%	114	0.7%
Western Isles	<5	1.1%	5	0.5%
Scotland	**185**	**0.7%**	**947**	**0.5%**

Table 61 Percentage of patients reported to have ever had lower limb amputation 2001-2009 (Type 1 and Type 2)

Year of Survey	Lower limb amputation	
2009	**1132**	**0.5%**
2008	1051	0.5%
2007	950	0.5%
2006	868	0.4%
2005 (a)	774	0.5%
2004	845	0.6%
2003	1014	0.8%
2002	996	1.0%
2001	908	0.9%

a Excludes Borders and Lanarkshire

Note: These figures are for those who have ever had an amputation in any year, and are still alive.

Foot risk calculation

Table 62 Foot risk calculation in the previous 15 months by NHS board as a percentage of all those with Type 1 diabetes

NHS Board	Active foot disease		High foot risk		Medium foot risk		Low foot risk		Not recorded		Total
Ayrshire & Arran	10	0.4%	6	0.3%	22	1.0%	288	12.9%	1908	85.4%	2234
Borders	2	0.3%	17	2.9%	27	4.5%	157	26.3%	393	65.9%	596
Dumfries & Galloway	8	0.9%	33	3.8%	59	6.8%	197	22.6%	574	65.9%	871
Fife	10	0.5%	60	3.2%	102	5.4%	495	26.1%	1229	64.8%	1896
Forth Valley	16	1.0%	51	3.3%	100	6.6%	538	35.3%	821	53.8%	1526
Grampian	14	0.5%	17	0.6%	34	1.1%	642	21.6%	2269	76.2%	2976
Greater Glasgow & Clyde	62	1.0%	120	2.0%	252	4.3%	1362	23.0%	4127	69.7%	5923
Highland	12	0.7%	78	4.6%	85	5.0%	626	37.1%	887	52.5%	1688
Lanarkshire	37	1.1%	111	3.2%	340	9.8%	1083	31.4%	1883	54.5%	3454
Lothian	22	0.5%	87	2.2%	92	2.3%	635	15.8%	3183	79.2%	4019
Orkney	0	0	6	5.1%	10	8.5%	17	14.4%	85	72.0%	118
Shetland	0	0	<5	1.8%	8	7.0%	84	73.7%	20	17.5%	114
Tayside	18	1.0%	83	4.7%	97	5.5%	840	47.4%	733	41.4%	1771
Western Isles	<5	0.6%	<5	1.1%	5	2.8%	18	9.9%	155	85.6%	181
Scotland	**212**	**0.8%**	**673**	**2.6%**	**1233**	**4.5%**	**6982**	**25.5%**	**18267**	**66.7%**	**27367**

Low risk = Normal sensation AND good pulses, no previous ulcer, no foot deformity, normal vision.
Moderate risk = ANY OF loss of sensation, absent pulses, (or previous vascular surgery), significant visual impairment, physical disability (e.g., stroke, gross obesity).
High risk = ANY OF previous ulcer due to neuropathy/ischaemia, absent pulses and neuropathy, callus with risk factor (absent pulse, neuropathy, foot deformity).
The Diabetes Foot Subgroup is encouraging use of this scoring system.

Table 63 Foot risk calculation in the previous 15 months by NHS board as a percentage of all those with Type 2 diabetes

NHS Board	Active foot disease		High foot risk		Medium foot risk		Low foot risk		Not recorded		Total
Ayrshire & Arran	24	0.2%	20	0.1%	95	0.6%	490	3.1%	15125	96.0%	15754
Borders	15	0.3%	123	2.7%	302	6.7%	1454	32.1%	2636	58.2%	4530
Dumfries & Galloway	42	0.7%	235	3.6%	815	12.6%	1466	22.7%	3895	60.4%	6453
Fife	45	0.3%	576	3.9%	1105	7.5%	2239	15.2%	10753	73.1%	14718
Forth Valley	41	0.4%	332	2.9%	801	6.9%	1780	15.4%	8589	74.4%	11543
Grampian	50	0.3%	129	0.7%	544	2.8%	4566	23.6%	14072	72.7%	19361
Greater Glasgow & Clyde	305	0.7%	1291	2.8%	5415	11.7%	13795	29.8%	25539	55.1%	46345
Highland	97	0.8%	652	5.7%	1364	11.9%	5165	45%	4192	36.5%	11470
Lanarkshire	171	0.8%	826	3.6%	2470	10.8%	8824	38.7%	10503	46.1%	22794
Lothian	183	0.7%	872	3.2%	1596	5.8%	4157	15.1%	20698	75.2%	27506
Orkney	<5	0.3%	29	3.7%	124	16%	90	11.6%	531	68.4%	776
Shetland	7	0.9%	34	4.3%	118	14.9%	430	54.3%	203	25.6%	792
Tayside	133	0.8%	1010	6.2%	2230	13.7%	8345	51.2%	4365	26.8%	16283
Western Isles	<5	0.4%	20	2.1%	41	4.4%	31	3.3%	843	89.8%	939
Scotland	**1119**	**0.6%**	**6149**	**3.1%**	**17020**	**8.5%**	**53035**	**26.6%**	**121944**	**61.2%**	**199,264**

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List of Tables and Figures

Appendix 1

Scottish Diabetes Survey 2009: Guidance and definitions

1. Total Regional population:

Mid-2008 Population Estimate - Source: General Register Office for Scotland (GROS)

http://www.gro-scotland.gov.uk/index.html

The 2009 Survey will be based on 14 health board areas and the full detailed National and Regional figures can be found here:

http://www.gro-scotland.gov.uk/statistics/publications-and-data/population-estimates/mid-2008-population-estimates-scotland/list-of-tables.html

	NHS Board areas	Persons (n)
1	Ayrshire & Arran	367,510
2	Borders	112,430
3	Dumfries & Galloway	148,580
4	Fife	361,815
5	Forth Valley	290,047
6	Grampian	539,630
7	Greater Glasgow & Clyde	1,194,675
8	Highland	309,900
9	Lanarkshire	561,174
10	Lothian	817,727
11	Orkney	19,890
12	Shetland	21,980
13	Tayside	396,942
14	Western Isles	26,200
	Scotland total	**5,168,500**

2. Area (regional) diabetes register:

This allows overall prevalence to be calculated. Patients should be alive*, have a diagnosis of frank diabetes (Type 1, Type 2, Type Unknown, Type "Other" and MODY are the current SCI-DC categories considered frank diabetes) and be registered with a practice in your region on the day of the data extraction.

*The only exception to this rule is when mortality is being quantified and patients may also be deceased and registered to the practice at the time of data extraction – see question 6.

2.1 Note that the 'Check' sums used throughout this report may vary depending upon the question but MUST equal the relevant figure recorded here e.g. the Type 1 and/or type 2 populations, all patients, etc.

2.2 The number of patients, if any, who have been excluded from the survey for reasons of non-consent, should be recorded.

2.3 Where questions refer to those with “Type 1 and Type 2” diabetes, this means that separate figures for each diabetes type are required – as opposed to a summation of both types

3. Use of CHI number:

3.1 Records the number of patients **with** a validated CHI number – as determined by CHI 24.

3.2 Records the number of patients **without** a validated CHI number

The Community Health Index (CHI) is a population register used for health care purposes and uniquely identifies a person on the index.

4. Type of diabetes:

4.1 Type 1
4.2 Type 2
4.3 Other types of diabetes*
4.4 Type Unknown

*'Other' should include Maturity Onset Diabetes of the Young (MODY), Type Unknown and Type “Other”, but should **exclude** Gestational diabetes and pre-diabetic conditions such as Impaired Glucose Tolerance (IGT) and Impaired Fasting Glucose (IFG).*

5. Age of people on register (all diabetes types):

Question	Age Band (Years)
5.1	0-4
5.2	5-14
5.3	15-24
5.4	25-34
5.5	35-44
5.6	45-54
5.7	55-64
5.8	65-74
5.9	75-84
5.10	>=85
5.11	Age unknown

*All ages are to be calculated at the day of data extraction and rounded **down** to the whole number at that time e.g. a person is 26 right up until the day of their 27th birthday*

6. Mortality (all diabetes types):

At the time of data extraction, all patients must be registered with a general practice within the region. This includes deceased patients as mortality does not affect registration status.

Question	Requirement	Methodology
6.1	Number of patients in the **numerator**	This shall be comprised of those patients, included in the denominator population (below), who died in the prior year
6.2	Number of patients in the **denominator**	This shall be comprised of all patients with diabetes who, at the time of data extraction, were either still alive or had died during the prior year.

6.3

Mortality should also be shown as a percentage and is calculated thus:

$$\frac{\text{All patients with diabetes who died in the prior year}}{\text{All patients with diabetes still alive } \textbf{plus} \text{ those who died in the prior year}} \times 100$$

7. Number of people with Type 1 and Type 2 diabetes in the following age bands:

Question	Age Band (Years)
7.1	0-4
7.2	5-9
7.3	10-14
7.4	15-19
7.5	20-24
7.6	25-29
7.7	30-34
7.8	35-39
7.9	40-44
7.10	45-49
7.11	50-54
7.12	55-59
7.13	60-64
7.14	65-69
7.15	70-74
7.16	75-79
7.17	80-84
7.18	>=85
7.19	Age unknown

All ages are to be calculated at the day of data extraction and rounded down to the whole number at that time e.g. a person is 26 up until the day of their 27th birthday

Note - The total number of people in the above categories will act as the check sum for the Type 1 and Type 2 populations in subsequent questions*

8. Children under 12 years (for the purposes of exclusion from specific questions):

9. Date of diagnosis in Type 1 and Type 2 diabetes:
Recorded | Not recorded/Not known

System defaults for "date unknown" (e.g. 01/01/1900 or 31/12/1899, etc depending on system) should be counted as "Not Known"

10. Duration of diabetes (years since diagnosis) in Type 1 and Type 2 diabetes:

Question	Duration Band (Years)
10.1	<1
10.2	1-4
10.3	5-9
10.4	10-14
10.5	15-19
10.6	25-29
10.7	30-34
10.8	35-39
10.9	40-44
10.10	45-49
10.11	>=50
10.12	Duration unknown

Note - <1 year is equivalent to incident cases*

Duration is calculated only where a valid date of diagnosis is recorded. Where defaults for "date unknown" (e.g. 01/01/1900 or 31/12/1899) are recorded, the duration should be considered "Not Known"

11. Sex of people on register in Type 1 and Type 2 diabetes:
Male | Female | Not recorded/Not known

Sex should be as determined by the CHI record if available

12. Insulin pumps (Continuous Subcutaneous Insulin Infusion) in Type 1 diabetes:

The number of patients with Type 1 diabetes who are using an insulin pump

13. Ethnic groups (self assigned) in Type 1 and Type 2 diabetes:

Ethnic group identified | Not recorded/Not known

An ethnic group is a group of people having racial, religious, linguistic and/or other cultural traits in common.

The ethnic group to which a patient belongs is judged by the patient. Ethnic categories should comply with, or map to, the National Clinical Dataset Development Programme (NCDDP) definitions:

(http://www.datadictionaryadmin.scot.nhs.uk/isddd/11139.html)

01 - White	
01	White

01E002	Irish
01E004	Scottish
01E039	Any other White background
01E070	Other British
02 - Mixed	
02	Mixed
02E029	Any Mixed background
03 - Asian, Asian Scottish or Asian British	
03	Asian, Asian Scottish or Asian British
03E041	Indian
03E042	Pakistani
03E043	Bangladeshi
03E059	Any other Asian background
03E081	Chinese
04 - Black, Black Scottish or Black British	
04	Black, Black Scottish or Black British
04E061	Caribbean
04E062	African
04E069	Any other Black background
05 - Other Ethnic Background	
05	Other Ethnic Background
05E089	Any other ethnic background
97 - Not disclosed	
99 - Not known	

14. BMI within prior 15 months in Type 1 and Type 2 diabetes:

Calculated | Not calculated/Data incomplete/Not known

Children under 12 years should be excluded.

Values outwith the 15-month time-frame should be considered "Not Calculated"

15. BMI range in Type 1 and Type 2 diabetes:

Question	BMI Range
15.1	<18.4
15.2	18.5-24.9
15.3	25-29.9
15.4	30-34.9
15.5	35-39.9
15.6	>=40
15.7	BMI unknown

Children under 12 years should be excluded.

BMI ranges should be based on the most recent value within the prior 15 months.

This is calculated using a weight less than 15 months and the most recent height which could be older than 15 months. Where only weights older than 15 months are found, these should be considered "Not Calculated"

16. HbA_{1c} recorded within prior 15 months in Type 1 and Type 2 diabetes:

Recorded within last 15 months | Not recorded/Data incomplete/Not known

Glycated haemoglobin refers to measurement of HbA_{1c} (not HbA1).

Values outwith the 15-month time-frame should be considered "Not Recorded"

17. Most recent HbA_{1c} measurement in Type 1 and Type 2 diabetes:

Question	HbA_{1c} Range (%)
17.1	<6.5
17.2	6.5-6.9
17.3	7.0-7.4
17.4	8.0-8.4
17.5	8.5-8.9
17.6	>=9.0
17.7	HbA1c unknown

HbA_{1c} ranges should be based on the most recent value within the prior 15 months.

HbA_{1c} values in this report are still presented using DCCT units (%). IFCC units (mmol/mol) will be used in future reports.

Values older than 15 months, being outwith the accepted time-frame should be considered "Not Recorded"

18. Mean HbA_{1c} recording in people with Type 1 and Type 2 diabetes within prior 15 months:

a) Mean HbA1c value for people with **Type 1** diabetes in each of the following age bands:

Question	Age Band (Years)
18.1	0-4
18.2	5-9
18.3	10-14
18.4	15-19
18.5	20-24
18.6	25-29
18.7	30-39
18.8	>=40

Ages are in 5 year bands up to 29 years followed by bands 30-39 and >=40

Patients with no recorded age are excluded from this tabulation

b) Mean HbA1c value for **ALL** people with **Type 2** diabetes

Mean HbA_{1c} should be calculated using the most recent value within the prior 15 months.

Values older than 15 months, being outwith the accepted time-frame should be considered "Not Recorded"

19. Blood pressure recorded within the previous 15 months in Type 1 and Type 2 diabetes:

Recorded within last 15 months | Not recorded/Data incomplete/Not known

Values outwith the 15-month time-frame should be considered "Not Recorded"

20. Most recent blood pressure measurement in Type 1 and Type 2 diabetes:

a) Number of Type 1 and Type 2 patients whose most recent systolic BP was <= **140** | No. of patients whose most recent systolic BP was >**140** | BP not recorded

b) Number of Type 1 and Type 2 patients whose most recent systolic BP was <= **130** | No. of patients whose most recent systolic BP was >**130** | BP not recorded

Blood pressure ranges should be based on the most recent value within the prior 15 months.

Values older than 15 months, being outwith the accepted time-frame should be considered "Not Recorded"

21. Mean Blood pressure measurement for patients within specified groups in the previous 15 months:

a) Mean blood pressure value for people with **Type 1** diabetes aged **<40** years

b) Mean blood pressure value for people with **Type 2** diabetes aged **>=50 and <60** years

Mean blood pressure figures should be calculated using the most recent systolic and diastolic values within the prior 15 months.

22. Total Cholesterol recorded within the previous 15 months in Type 1 and Type 2 diabetes:

Recorded within last 15 months | Not recorded/Data incomplete/Not known

Children under 12 years should be excluded.

Values outwith the 15-month time-frame should be considered "Not Recorded"

23. Most recent total cholesterol measurement in Type 1 and Type 2 diabetes:

Number of patients whose most recent total cholesterol was <=5 | Number of patients whose most recent cholesterol was > 5 | Cholesterol not recorded

Children under 12 years should be excluded.

Cholesterol ranges should be based on the most recent value within the prior 15 months.

Values older than 15 months, being outwith the accepted time-frame should be considered "Not Recorded"

24. Mean cholesterol in those with Type 2 diabetes within a specified age band:

Mean total cholesterol value for those with type 2 diabetes aged **>=50 and <60** years

Cholesterol ranges should be based on the most recent value within the prior 15 months.

25. Serum creatinine recorded within prior 15 months in Type 1 and Type 2 diabetes:

Recorded within last 15 months | Not recorded/Data incomplete/Not known

Children under 12 years should be excluded.

Values outwith the 15-month time-frame should be considered "Not Recorded"

26. Estimated GFR recorded within prior 15 months in Type 1 and Type 2 diabetes:

Recorded within last 15 months | Not recorded/Data incomplete/Not known

Children under 12 years should be excluded

Values outwith the 15-month time-frame should be considered "Not Recorded"

27. Most recent Estimated GFR (eGFR) measurement in Type 1 and Type 2 diabetes:

Question	eGFR Range
27.1	<15
27.2	15-29
27.3	30-44
27.4	45-59
27.5	>=60
27.6	Not Recorded

Children under 12 years should be excluded

Estimated GFR ranges should be based on the most recent value within the prior 15 months. Values older than 15 months, being outwith the accepted time-frame should be considered "Not Recorded"

28. Urinary microalbumin recorded within prior 15 months in Type 1 and Type 2 diabetes:

Recorded within last 15 months | Not recorded/Data incomplete/Not known

Children under 12 years should be excluded.

Urine specimen tested for presence of microalbuminuria by any method is sufficient for the purposes of the 2009 Survey (Albumin concentration, albumin: creatinine ratio, timed overnight albumin excretion rate or 24 hour albumin excretion rate. Urinary dipstick should not be used unless able to detect low levels of albuminuria and express an ACR).

Values outwith the 15-month time-frame should be considered "Not Recorded"

29. Smoking status in Type 1 and Type 2 diabetes:

Current smoker | Ex-smoker | Never smoked | Not recorded/Not known.

30. Diabetic Retinopathy Screening (DRS) within the previous 15 months in Type 1 and Type 2 diabetes:

Screened by DRS | Attends Ophthalmology clinic | Excluded from Screening | Screening status not recorded.

Children under 12 years should be excluded.

A person should be recorded as having been screened if they have had a completed episode of appropriate diabetic retinal screening (Digital Image Photography or evaluation at a consultant-led ophthalmology clinic for the purpose of treatment or surveillance of diabetic retinopathy).

Fundoscopy and other eye examination methods outwith the approved DRS criteria should be excluded.

Assessments outwith the 15-month time-frame should be considered "Not Recorded"

31. Diabetic Retinopathy - Left or right eye in Type 1 and Type 2 diabetes:

Present | Absent | Attends Ophthalmology clinic* | Not Recorded/Not Known

Present means any degree of retinopathy recorded as present in left and/ or right eye; absent means 'no retinopathy' recorded for both eyes.

** May be attending Ophthalmology for non-diabetic pathologies.*

Children under 12 years should be excluded.

Retinal status should be based on the most recent assessment within the previous 15 months. Assessments older than 15 months, being outwith the accepted time-frame should be considered "Not Recorded"

Patients who WERE screened by the DRS service in the previous 15 months but had no retinal status recorded (e.g. those awaiting a screener's report or where both retinae were not adequately visualised) should be considered "Not known" for this question.

32. Blindness in Type 1 and Type 2 diabetes:

Diabetic cause | Non-diabetic cause | Cause not recorded/not known

Blindness may be recorded where a clinical record confirms this or can defined as visual acuity corrected (i.e. wearing corrective lenses) of <3/60 (i.e. CF, HM or PL) in the better eye.

As the permanency or otherwise of the latter method may be difficult to determine, caution in interpreting these particular figures is advised.

33. Myocardial infarct in Type 1 and Type 2 diabetes:

Recorded as ever having had an acute myocardial infarction

34. Cardiac Revascularisation in Type 1 and Type 2 diabetes:

Recorded as having undergone cardiac revascularisation

All forms of revascularisation including stents and angioplasty.

35. Stroke in Type 1 and Type 2 diabetes:

Recorded as having had a stroke

Stroke (cerebrovascular accident) - defined as rapidly developing signs of focal (and/or global) disturbance of cerebral function lasting more than 24 hours or leading to death with no apparent cause other than vascular origin.

36. Peripheral pulses recorded within the previous 15 months in Type 1 and Type 2 diabetes:

Recorded within last 15 months | Not recorded/Data incomplete/Not known

Assessments outwith the 15-month time-frame should be considered "Not Recorded"

37. Foot ulceration in Type 1 and Type 2 diabetes:

Recorded as ever having had a foot ulcer

Foot ulcer is defined as any break in the epithelium greater than a crack below the level of the malleoli.

38. Foot risk calculation within the previous 15 months in Type 1 and Type 2 diabetes:

Active foot disease | Foot risk high | Foot risk medium | Foot risk low | Not recorded/Data incomplete/Not known

Foot risk should be based on the most recent assessment within the previous 15 months.

Where assessments are bilateral (right and left foot assessed separately), the WORSE risk status should be used.

Assessments outwith the 15-month time-frame should be considered "Not Recorded"

The risk grading of the foot of a patient with diabetes mellitus, assessed using criteria from SIGN Guideline 55.

Active foot disease = current ulceration, uncontrolled neuropathy, Charcot foot

High risk = **ANY** previous ulcer due to neuropathy/ischaemia, absent pulses and neuropathy, callus with risk factor (absent pulse, neuropathy, foot deformity).

Moderate risk = **ANY** loss of sensation, absent pulses, (or previous vascular surgery), significant visual impairment, physical disability (e.g., stroke, gross obesity).

Low risk = Normal sensation **AND** good pulses, no previous ulcer, no foot deformity, normal vision.

39. Lower limb amputation in Type 1 and Type 2 diabetes:

Recorded as ever having had a lower limb amputation

Amputation is defined as recommended in the SIGN guideline on management of diabetic foot disease as 'removal of forefoot or part of the lower limb'.

This excludes loss of toes or single metatarsals.

40. End stage renal failure in Type 1 and Type 2 diabetes:

Recorded as having end stage renal failure

"Either serum creatinine was chronically greater than 500 µmol/l or eGFR was less than 15 (stage 5 renal failure) on two occasions at least three months apart within the previous 15 month, or the patient has ever been placed on permanent dialysis or received a renal transplant".

41. Deprivation Category in Type 1 and Type 2 diabetes:

This allows the deprivation profile of the diabetic population to be compared to the profile of the NHS Board and the Scottish population as a whole. Deprivation quintiles are derived from the Scottish Index of Multiple Deprivation (SIMD) rankings

(http://www.scotland.gov.uk/Topics/Statistics/SIMD/)

Quintiles divide the Scottish population into five overall deprivation categories ranging from 1 (Most Deprived) to 5 (Least Deprived).

Deprivation quintiles can be assigned to diabetic populations via patient postcodes.

Changes and comments:

General - Unless specific to all patients or a particular diabetes type, questions are now spilt separately into Type 1 and Type 2 populations. These can, if desired, be combined at the analysis stage to allow Type 1 **plus** Type 2 observations.

Question 2. Area diabetes register – it has been suggested that the survey date (31st December) be explicitly flagged as the index date for data extraction. This has not been done as it may be interpreted as the cut off date for the survey and that all data after this should be excluded. As most health boards use the auto-updating survey data on SCI-DC and, as they usually extract and return this after the holidays (usually around the 4th or 5th January) it may not be helpful to define the return date. It is better to just include the more generic "on the day of data extraction". This would also allow survey returns that may be extracted prior to the 31st December (some may like to do it a couple of days BEFORE the holidays) without making the guidance statement untrue.

Also, delays due to technical and other issues, as have happened in the past, make achieving a static survey return date sometimes unrealistic.

Question 6. Mortality (all diabetes types) – This is a new question and, following discussion, the method for determining crude mortality shall be: All patients must be registered to a practice in the region at the time of data extraction:

Numerator = all patients from the denominator population who died in the prior year.

Denominator = all patients with frank diabetes (any type) who were alive on the date of data extraction **plus** those with frank diabetes who died in the prior year

In order to allow a national mortality figure to be determined, each region shall provide the numbers of patients in the numerator and denominator populations, as well as a mortality percentage value.

Question 7. Number of people with Type 1 and Type 2 diabetes by age Population ages are now in 5 year bands up to 85 years. This does not make data extraction any more difficult but will allow us to manipulate the post-extract data as we see fit. We can, by summing bands together (easy in any Excel or similar programme) create any 5 year, or multiple of 5 year, age band/s as desired – either to allow comparison to previous reports or to show a more (or less) detailed breakdown of any particular patient group independently e.g. type 1 versus type 2.

Question 12. Insulin pumps (Continuous Subcutaneous Insulin Infusion) in Type 1 diabetes – This is a new question and the figures are not currently available via SCI-DC. Each region, therefore, must ascertain the number of Type 1 patients with pumps by their own means

Question 13. Ethnic groups in Type 1 and Type 2 diabetes – the guidelines were still referring to OPCS classifications and these no longer apply. The current definitions relate to the 2001 Census (Scotland). These may be changing and that is something we will need to address in the future. In order to provide a generic ethnic guideline I have amended the reference state that the ethnic grouping should be compatible with the National Clinical Dataset Development Programme (NCDDP) categories - as SCI-DC is - and have provided the web address of the ISD webpage that has these.

Question 17. Most recent HbA1c measurement in Type 1 and Type 2 diabetes – we are trying to align this with the QoF/GMS/NICE targets. As these targets differ for type 1 and type 2 patients, extra categories have been added to the HbA1c bands (now <6.5, 6.5 - 6.9, 7.0 - 7.4, 7.5 - 7.9, 8.0 - 8.4, 8.5 - 8.9, >=9.0). This won't make data extraction more difficult but will allow the data to cover all target cut off points as suggested and can be summed together as desired at the report production stage to be presented as is seen fit e.g. separate bandings for Type 1 versus Type 2 patients. This will still allow comparison with previous reports to be done. HbA1c measurements in this report use DCCT units (%) but future reports shall include IFCC units (mmol/mol).

Question 20. Most recent blood pressure measurement in Type 1 and Type 2 diabetes – this question has been expanded to include those Type 1 and Type 2 patients whose SBP is **<= or >130 mmHg.** This is in addition to the original question (**SBP is <= or >140 mmHg**). The original will allow comparison with previous years and the additional field will begin the inclusion of the lower target. Should we decide to stop referring to the old target, we can just leave this out at publication.

Question 21. Mean Blood pressure measurement for patients with Type 1 and Type 2 diabetes within prior 15 months – this question now has 2 parts:
a) Type 1 patients aged less than 40 years
b) Type 2 patients aged 50-59 years.
Again, whether both will be included in the final report can be decided later.

Question 22. Total Cholesterol recorded within prior 15 months in Type 1 and Type 2 diabetes – now limited to total cholesterol only

Question 30. **Diabetic Retinopathy Screening (DRS) within prior 15 months in Type 1 and Type 2 diabetes –** now includes "Attends Ophthalmology clinic" and "Excluded from Screening" as possible answers. This will allow us to quantify patients who are a) having appropriate eye-care elsewhere and b) legitimately excluded from eye-screening and are thus, not part of the screening population. This should lower amount of patients who have previously been counted as "Screening status not recorded" as we will now have a more relevant category for many them.

Question 31. Diabetic Retinopathy - Left or right eye in Type 1 and Type 2 diabetes – while we can provide retinal statuses via the DRS (screening) system and can also provide information on patients attending hospital ophthalmology clinics, we cannot provide any retinal statuses on patients attending the clinics. In order to include such patients in this question, a new category of, "Attends Ophthalmology clinic" has been created. As the actual reason for attending is unknown, there will need to be a caveat clarifying that the patients may be doing so due to non-diabetic pathologies.

Question 41. Deprivation Category in Type 1 and Type 2 diabetes – this was not used directly in the last survey (2008) report but as it has been requested (previously using Carstair Scores) for many years and as it is already in the SCI-DC auto-calculated SDS page, it has been retained. It requires no extra work but could be a major omission if we ever want to do some retrospective comparisons of survey figures in the future. This has been split into Type 1 and Type 2 patient populations in line with the deprivation table in the 2008 report (which came via the SDRN Epidemiology group).

Appendix 2
SCI-DC Methodology

Scottish Care Information Diabetes Collaboration (SCI-DC) is the national suite of information technology systems designed to support the care of patients with diabetes in Scotland. SCI-DC Network is the main component and provides secure, web-based access to the shared patient record for diabetes.

In order to create a central repository for diabetes it was necessary to link to, and create extracts from all relevant sources of diabetes data. SCI-DC employs a combination of real-time and batch processing interfaces to ensure that relevant information is available at the right place, at the right time, and where possible only has to be entered once. Clinical data is currently captured from primary care, secondary care, screening services, laboratories and via direct entry.

Data are linked using the NHS Scotland Community Health Index (CHI) unique patient identifier. The link to CHI is a key component for identifying patient demographics and currently registered General Practitioner, ensuring that all Primary Care staff can only get access to those patients under their care and that demographic information is kept up-to-date.

SCI-DC conforms to nationally agreed datasets developed by the National Clinical Dataset Development Programme (NCDDP). The purpose of defining these data items is to provide a common language or “currency” to maintain a system that can be used for local audit and benchmarking in addition to its clinical function. This is another key element which aims to improve the consistency of data collection across Scotland and is particularly important for the regional comparisons used in the Scottish Diabetes Survey.