



Scottish Diabetes Survey 2016

Scottish Diabetes Survey Monitoring Group

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Foreword

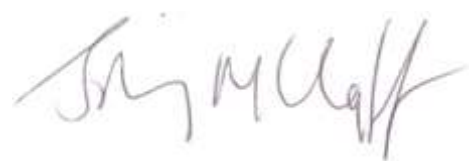
This is now the 16th year of the Scottish Diabetes Survey that describes aspects of diabetes care in Scotland in December 2016. It contains core information from over 99% of people diagnosed with diabetes in Scotland, thereby comprehensively describing the work of patients, carers and health care professionals across all of Scotland. It combines information from many sources both in hospitals and in the community that provide integrated care through the managed clinical networks. The data also reflect the influence of Scottish Government policy, the Scottish Diabetes Group and the third sector such as Diabetes Scotland.

The information in the survey and previous surveys have been used to describe changes in diabetes care and outcomes during the last 15 years. These analyses, of the Scottish Diabetes Research Network Epidemiology Group, have described improved outcomes for people with Type 1 and Type 2 diabetes during the last 10 years and have been presented elsewhere at medical meetings and in leading diabetes and other medical journals.

We have identified the need to improve some aspects of diabetes care. There has been some improvement in Type 1 diabetes control, but there is a real need to build on this and make more rapid improvement in this. The widespread introduction of insulin pump therapy should help with this as should the introduction of some Continuous Glucose Monitoring systems.

Recording of BMI, blood pressure and cholesterol appear to be reduced this period; for blood pressure and for cholesterol they are the lowest they have been for ten years. It is perhaps noteworthy that this coincides with the decommissioning of the Quality Outcomes Framework. The measures of care described for each NHS Board is designed to continue to provide local managed clinical networks with information to help influence improvement in these measures.

We expect the leaders and governance teams in each NHS Board to reflect on the information provided and develop plans to improve the care and outcome for patients with diabetes in their regions.



John A McKnight
Chairman
Scottish Diabetes Data Group

Executive Summary

This report presents the results of the 2016 Scottish Diabetes Survey. The survey collates information submitted by all 14 NHS Boards and 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 Type 2 diabetes.

In this Scottish Diabetes Survey 2016, we report that:

- There were 291,981 people diagnosed with diabetes in Scotland recorded on local diabetes registers at the end of 2016. This represents 5.4% of the population (Table 1);
- Crude prevalence of diabetes ranged from 4.6% to 6.3% across NHS Boards (Table 1);
- 88.3% (257,728) of all people registered with diabetes had Type 2 diabetes (Table 15);
- 10.6% of all registered people had Type 1 diabetes. The number of people registered with Type 1 diabetes increased from 26,294 in 2006 to 30,899 in 2016 (Table 15);
- 1.1% (3,354) were recorded as having “other” types of diabetes, including maturity onset diabetes of the young (MODY) and those with unknown diabetes type (Table 15);
- Of patients with a recorded BMI, 37.3% with Type 1 diabetes and 31.6% with Type 2 diabetes were overweight (BMI 25-29.9kg/m²), and a further 26% of those with Type 1 diabetes and 55.6% of those with Type 2 diabetes were obese (BMI 30kg/m² or above), meaning a total of 63.3% of those with Type 1 diabetes and 87.2% of those with Type 2 diabetes were above their ideal weight (Tables 22 and 23);
- 90.3% (Type 1) and 92.8% (Type 2) had an HbA_{1c} recorded in the previous 15 months. Of these, 24.5% and 58.6% had a result < 58mmol/mol, the target reported in previous surveys (Tables 25, 26 and 27);
- 84.9% of those with Type 1 and 91.8% of those with Type 2 diabetes had their blood pressure recorded in the previous 15 months (Tables 36 and 37). Of these, 45.0% and 32.7% respectively had a systolic blood pressure <130 mmHg and a diastolic blood pressure ≤80 mmHg (Tables 39 and 41);
- Cholesterol was recorded in 86.4% of patients within the previous 15 months, and the target of ≤ 5 mmol/l was achieved in 69.1% of those with Type 1 and 78.4% of those with Type 2 diabetes (Tables 45, 46 and 47);
- 22.9% (Type 1) and 17.2% (Type 2) were current smokers (Table 50 and Table 51);
- 1,067 (3.5%) of those with Type 1 and 24,977 (9.7%) of those with Type 2 diabetes have previously had a myocardial infarction, and 2.6% and 7.5% respectively have undergone cardiac revascularisation (Tables 53 and 55);
- 437 (1.4%) of those with Type 1 and 1,472 (0.6%) of those with Type 2 diabetes have a record of having end stage renal failure (Table 62);
- 85.4% of people with Type 1 or Type 2 diabetes had eye screening in the previous 15 months (Table 63);

- 59.1% of patients with Type 1 diabetes and 73.2% of those with Type 2 had their foot scores recorded in the previous 15 months (Tables 68 and 69);
- 350 (1.1%) of those with Type 1 and 1,705 (0.7%) of those with Type 2 diabetes have a record of having had a major lower limb amputation (Table 72).

Prevalence

At the end of 2016 there were 291,981 people with known diabetes in Scotland recorded on local diabetes registers, which represents a crude prevalence of 5.4% of the population. In the 2015 Scottish Diabetes Survey, 284,122 people (5.3%) 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 the increasing number of older people each year increases the prevalence of diabetes
- better survival, possibly related to the widespread use of statins or changes to other risk factors
- possibly better detection of diabetes in people with type 2 diabetes, many of whom have no symptoms

Table 1. Crude and age-adjusted prevalence of diabetes (all types), by NHS Board, ranked by age-adjusted prevalence.

NHS Board	Population	Number on the diabetes register at the end of the year	Crude prevalence (%)	Age-adjusted prevalence (%)
Western Isles	27,070	1,421	5.2	4.5
Highland	321,000	17,100	5.3	4.7
Orkney	21,670	1,168	5.4	4.7
Shetland	23,200	1,123	4.8	4.8
Borders	114,030	6,694	5.9	5.0
Grampian	587,820	28,420	4.8	5.1
Lothian	867,800	40,197	4.6	5.1
Dumfries and Galloway	149,670	9,412	6.3	5.3
Tayside	415,040	23,294	5.6	5.3
Forth Valley	302,650	16,729	5.5	5.5
Fife	368,080	21,389	5.8	5.6
Ayrshire and Arran	370,590	23,489	6.3	5.8
Greater Glasgow and Clyde	1,149,890	62,874	5.5	5.8
Lanarkshire	654,490	38,671	5.9	6.0
Scotland	5,373,000	291,981	5.4	5.4

Variation between NHS 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, gives confidence in the completeness of recording. The increased prevalence in recent years is likely to be real rather than because of better reporting.

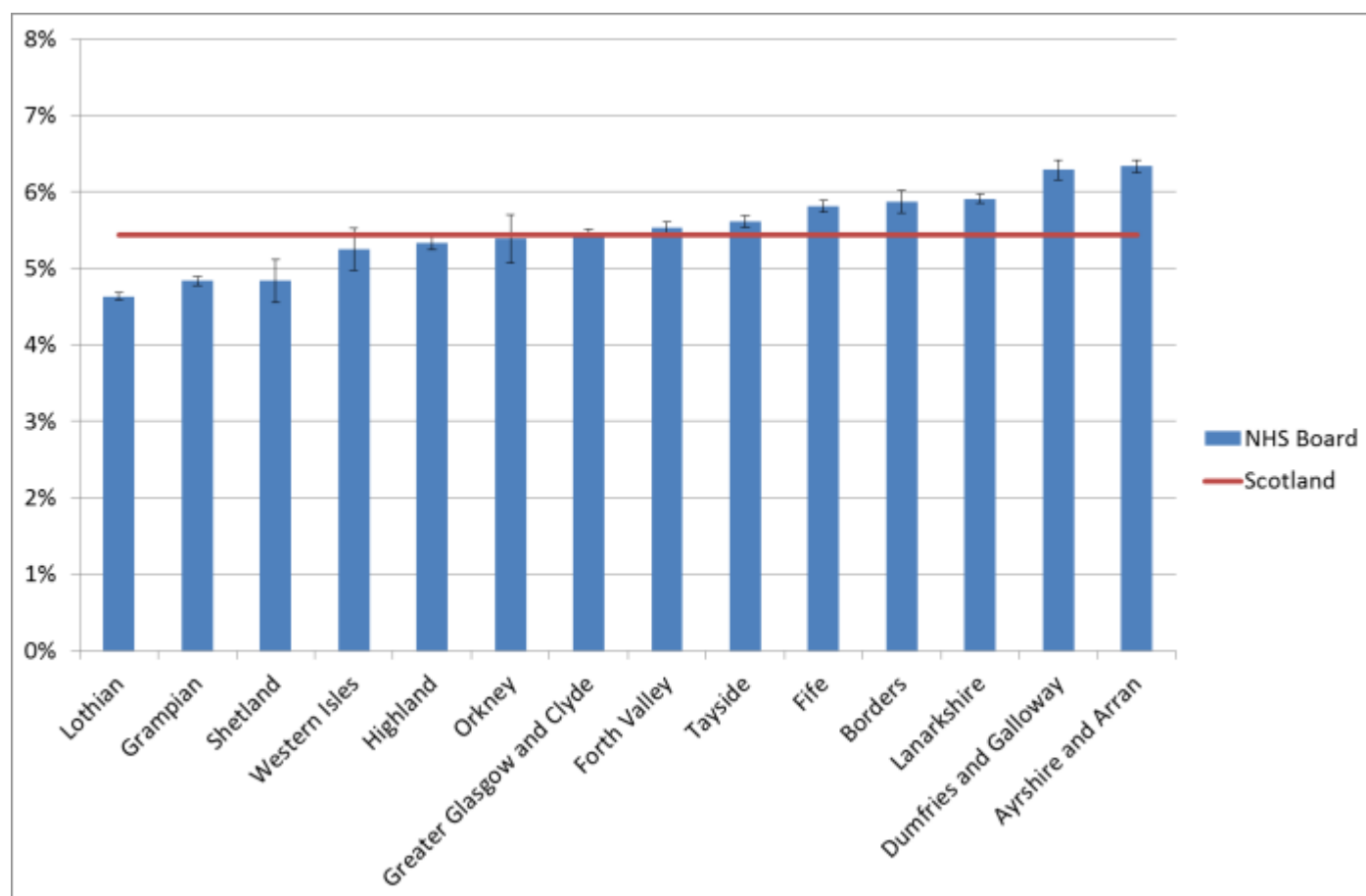
Table 2. Crude prevalence of diabetes for patients aged 65 and over (all types), by NHS Board, ranked by prevalence.

NHS Board	Age >= 65 (n)	Age >= 65 with Diabetes	Prevalence in those aged >= 65 (%)
Western Isles	6,561	811	12.4
Shetland	4,327	588	13.6
Highland	70,401	9,596	13.6
Orkney	4,814	674	14.0
Borders	26,748	3,962	14.8
Lothian	138,627	20,544	14.8
Dumfries and Galloway	36,341	5,426	14.9
Grampian	100,526	15,159	15.1
Tayside	85,191	13,217	15.5
Forth Valley	55,364	8,793	15.9
Ayrshire and Arran	79,107	12,633	16.0
Fife	72,362	11,586	16.0
Greater Glasgow and Clyde	188,455	30,632	16.3
Lanarkshire	114,174	19,407	17.0
Scotland	982,998	153,028	15.6

Age-adjusted prevalence is based on direct age/sex standardisation using the Scottish population as the reference population structure. Population figures are based on mid-year population estimates published by National Records of Scotland. Because of publication dates, surveys have in each case used population figures for the previous year - so that the 2016 survey uses diabetes data from 2016 but mid-year population estimates from 2015. This will lead to a very small overestimate of diabetes prevalence.

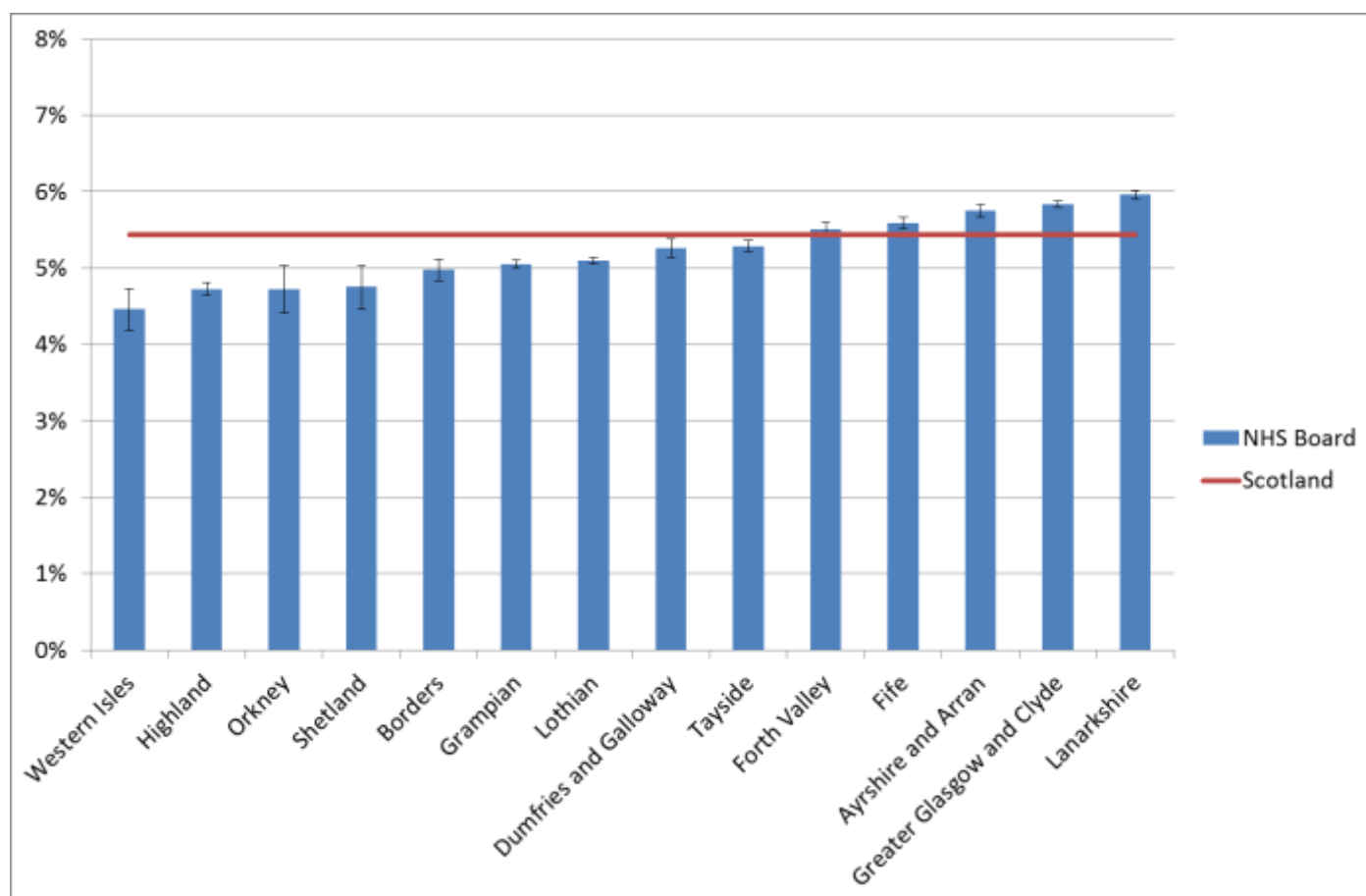
Differences in prevalence are due to a number of factors. One is age - Type 2 diabetes is more common in older age groups so the age structure of an area will affect the crude prevalence. A health board area with an older population will have a higher crude prevalence; e.g. the crude (unadjusted) prevalence of diabetes in Dumfries & Galloway is above the Scottish average; however when the figure is adjusted for the age of the population, the Dumfries & Galloway prevalence is actually lower than the Scottish average. Other reasons for differences in observed prevalence are given at the start of this section.

Figure 1. Crude diabetes prevalence (all types) by NHS Health Board, ranked by prevalence



Note: Vertical capped lines show 95% confidence intervals.

Figure 2. Age-adjusted diabetes prevalence (all types) by NHS Health Board, ranked by prevalence.



Note: Vertical lines show 95% confidence intervals.

Table 1 and Figures 1 and 2 show both crude and age-adjusted figures for the prevalence of diabetes of all types in 2015. The age-adjusted figures take account of the fact that the average age differs between boards and that older populations have higher diabetes prevalence. Table 2 shows that the prevalence of diabetes is particularly high among those aged 65 and over.

Figure 3. Number of people with diabetes (all types) in each NHS Health Board.

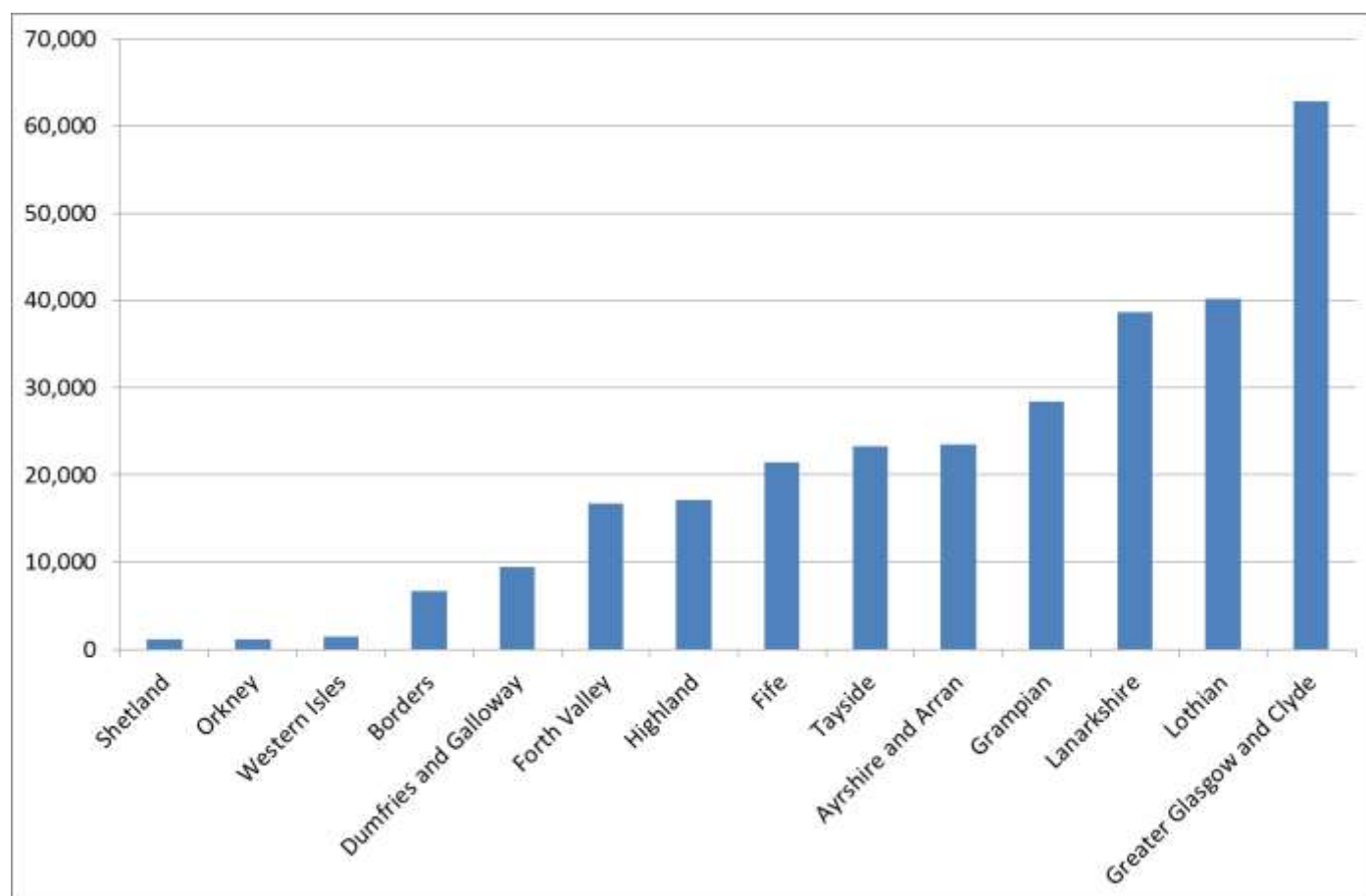


Figure 4. Number of people recorded with diabetes (all types).

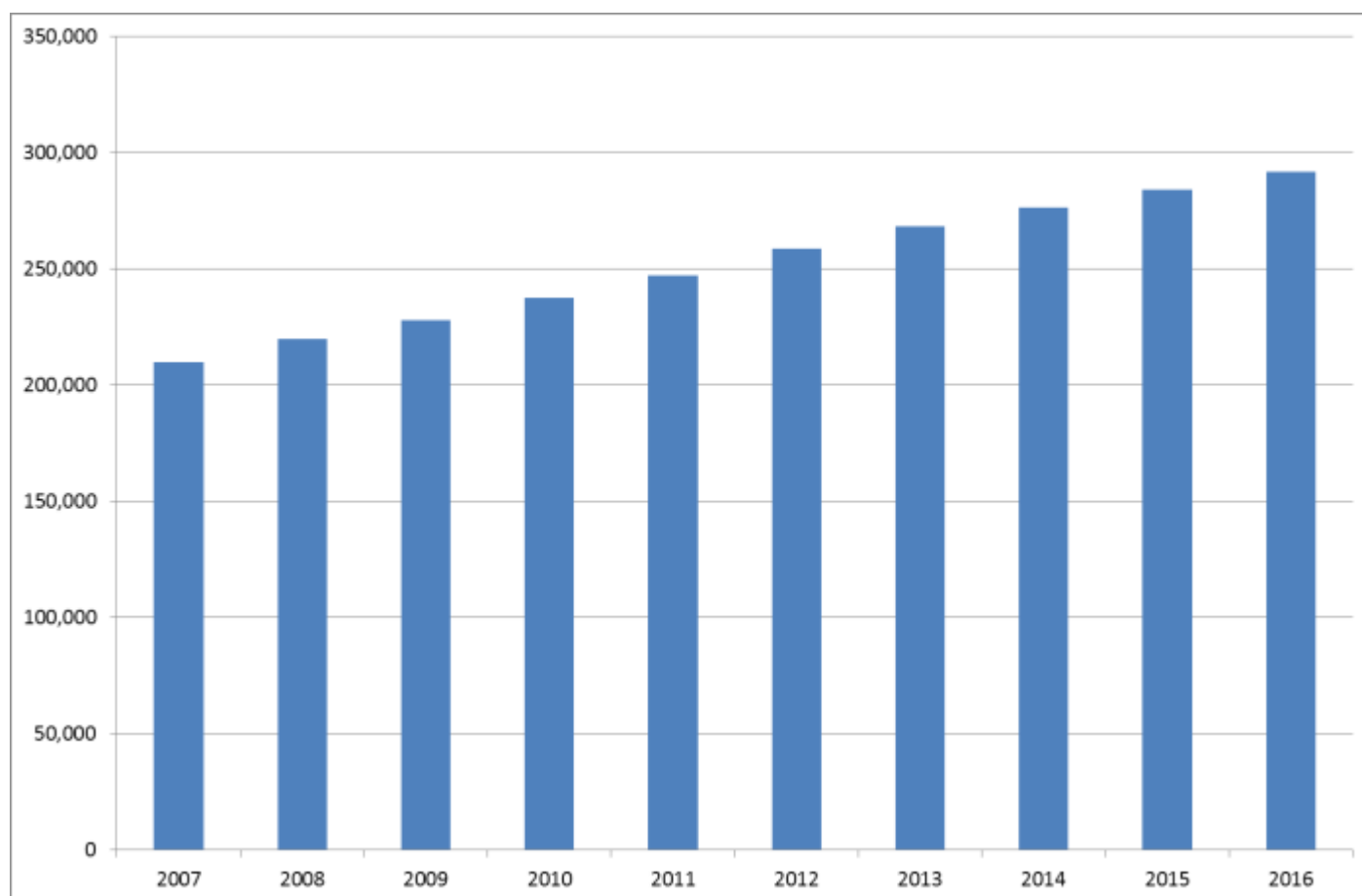


Table 3. Number of people with diabetes, crude prevalence of diabetes and changes in numbers/proportions.

Survey	Diabetes register (n)	Crude prevalence (%)	Patient Increase (n)	Patient Increase (%)	Absolute increase (%)
2016	291,981	5.43	7,859	2.77	0.12
2015	284,122	5.31	7,692	2.78	0.12
2014	276,430	5.19	8,276	3.09	0.14
2013	268,154	5.05	9,584	3.71	0.13
2012	258,570	4.92	11,292	4.57	0.18
2011	247,278	4.74	9,810	4.13	0.16
2010	237,468	4.57	9,464	4.15	0.16
2009	228,004	4.41	8,041	3.66	0.14
2008	219,963	4.28	10,257	4.89	0.18
2007	209,706	4.10	12,905	6.56	0.24

Incidence

Crude incidence figures have been calculated retrospectively using SCI-Diabetes data and therefore may be slightly affected by factors such as post-survey patient migration and on-going validation of diabetes classification.

Table 4. Type 1 diabetes: Number of new cases and incidence rate (per 100,000 population per year) by age.

Age	2009		2010		2011		2012		2013		2014		2015		2016		
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Population	Cases	Rate
0-4	148	27	145	26	166	29	66	22	51	17	56	19	73	25	291,174	64	22
5-9							137	50	88	32	105	37	114	40	292,356	117	40
10-14	258	41	268	43	244	40	152	54	125	44	140	51	120	44	272,142	179	66
15-19							110	35	104	33	116	37	98	32	303,983	102	34
20-29	168	24	177	25	205	29	172	24	159	22	159	22	160	22	731,556	165	23
30-39	145	22	127	20	129	20	118	18	111	17	110	17	125	19	668,037	107	16
40-49	92	12	93	12	114	14	96	12	82	10	86	11	95	12	745,643	84	11
50-59	71	11	69	10	63	9	66	9	74	10	58	8	75	10	768,113	63	8
60-69	44	8	50	9	37	6	43	7	36	6	26	4	22	4	629,953	44	7
>=70	28	5	29	5	15	2	18	3	18	3	27	4	16	2	670,043	18	3
Total	954	18	958	18	973	19	978	19	848	16	883	17	898	17	5,373,000	943	18

Table 5. Type 1 diabetes: Incidence rate (per 100,000 population per year) by age.

Age range	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
0-9	22	24	27	26	29	36	24	28	32	31
10-19	44	42	41	43	40	44	38	43	37	49
20-29	26	24	24	25	29	24	22	22	22	23
30-39	24	21	22	20	20	18	17	17	19	16
40-49	19	16	12	12	14	12	10	11	12	11
50-59	10	8	11	10	9	9	10	8	10	8
60-69	6	10	8	9	6	7	6	4	4	7
>=70	6	4	5	5	2	3	3	4	2	3
Total	20	19	18	18	19	19	16	17	17	18

Table 6. Type 2 diabetes: Number of new cases and incidence rate (per 100,000 population per year) by age.

Age	2009		2010		2011		2012		2013		2014		2015		2016		
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Population	Cases	Rate
0-9	2	0	0	0	0	0	0	0	1	0	0	0	0	0	583,530	0	0
10-19	22	4	18	3	10	2	21	3	8	1	19	3	20	3	576,125	17	3
20-29	164	24	166	24	163	23	208	29	178	25	197	27	165	23	731,556	228	31
30-39	797	120	755	116	730	113	939	146	810	124	756	115	834	127	668,037	869	130
40-49	2,667	335	2,555	321	2,552	322	2,733	347	2,570	323	2,467	315	2,432	318	745,643	2,364	317
50-59	4,411	653	4,787	629	4,106	595	4,567	650	4,387	606	4,210	570	4,451	591	768,113	4,417	575
60-69	5,286	944	4,870	851	4,741	814	4,943	833	5,013	826	4,513	734	4,677	753	629,953	4,570	725
>=70	5,286	867	4,925	799	4,667	747	4,596	729	4,876	762	4,217	649	4,472	675	670,043	4,508	673
Total	18,627	360	17,576	338	16,969	325	18,007	343	17,853	336	16,379	307	17,051	319	5,373,000	16,973	316

Table 7. Type 2 diabetes: Incidence rate (per 100,000 population per year) by age.

Age range	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
0-9	0	0	0	0	0	0	0	0	0	0
10-19	4	3	4	3	2	3	1	3	3	3
20-29	23	24	24	24	23	29	25	27	23	31
30-39	101	127	120	116	113	146	124	115	127	130
40-49	304	310	335	321	322	347	323	315	318	317
50-59	608	628	653	629	595	650	606	570	591	575
60-69	955	917	944	851	814	833	826	734	753	725
>=70	835	874	867	799	747	729	762	649	675	673
Total	339	350	360	338	325	343	336	307	319	316

Table 8. Type 1 diabetes: Number of new cases and crude incidence rate for all ages (cases per 100,000 population per year) by NHS Board, ranked by rate in the last year.

NHS Board	2009		2010		2011		2012		2013		2014		2015		2016	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Shetland	5	23	6	27	3	13	4	18	1	4	5	22	7	30	2	9
Orkney	2	10	4	20	5	25	3	15	0	0	0	0	2	9	2	9
Ayrshire and Arran	70	19	69	19	68	19	79	22	64	17	73	20	67	18	51	14
Forth Valley	50	17	64	22	61	21	70	24	52	17	56	19	55	18	43	14
Highland	69	22	53	17	74	24	49	16	62	19	54	17	50	16	50	16
Dumfries and Galloway	29	20	26	18	20	13	20	14	21	14	20	13	23	15	25	17
Lanarkshire	127	23	103	18	110	20	110	20	88	15	93	14	110	17	113	17
Greater Glasgow and Clyde	218	18	205	17	221	18	228	19	187	15	193	17	194	17	202	18
Tayside	57	14	71	18	58	14	73	18	65	16	59	14	67	16	76	18
Grampian	115	21	123	23	117	21	90	17	88	15	111	19	111	19	108	18
Lothian	136	17	155	19	136	16	153	18	152	18	147	17	136	16	163	19
Fife	56	16	53	15	80	22	63	17	47	13	52	14	50	14	74	20
Borders	16	14	20	18	17	15	20	18	16	14	12	11	19	17	26	23
Western Isles	4	15	6	23	3	11	9	35	5	18	8	29	7	26	8	30
Scotland	954	18	958	18	973	19	978	19	848	16	883	17	898	17	943	18

Table 9. Type 1 diabetes: Crude incidence rate of new cases for all ages (cases per 100,000 population per year) by NHS Board, ranked by rate in the last year.

NHS Board	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Shetland	14	18	23	27	13	18	4	22	30	9
Orkney	15	30	10	20	25	15	0	0	9	9
Ayrshire and Arran	21	20	19	19	19	22	17	20	18	14
Forth Valley	17	21	17	22	21	24	17	19	18	14
Highland	14	21	22	17	24	16	19	17	16	16
Dumfries and Galloway	16	16	20	18	13	14	14	13	15	17
Lanarkshire	25	19	23	18	20	20	15	14	17	17
Greater Glasgow and Clyde	21	18	18	17	18	19	15	17	17	18
Tayside	18	19	14	18	14	18	16	14	16	18
Grampian	15	19	21	23	21	17	15	19	19	18
Lothian	23	18	17	19	16	18	18	17	16	19
Fife	22	17	15	15	22	17	13	14	14	20
Borders	19	17	14	18	15	18	14	11	17	23
Western Isles	15	19	15	23	11	35	18	29	26	30
Scotland	20	19	18	18	19	19	16	17	17	18

Table 10. Type 2 diabetes: Number of new cases and crude incidence rate for all ages (cases per 100,000 population per year) by NHS Board, ranked by rate in the last year.

NHS Board	2009		2010		2011		2012		2013		2014		2015		2016	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Shetland	74	337	75	338	82	366	51	227	51	220	76	328	77	331	59	254
Grampian	2,063	382	1,721	316	1,596	290	1,866	336	1,995	348	1,710	295	1,706	292	1,551	264
Lothian	2,211	270	1,988	241	2,191	262	2,271	268	2,303	273	2,096	247	2,067	241	2,445	282
Fife	1,315	363	1,296	357	1,235	338	1,363	371	1,397	381	1,367	373	1,074	292	1,125	306
Greater Glasgow and Clyde	4,039	338	3,952	330	3,801	316	4,131	341	4,159	342	3,807	335	4,022	352	3,604	313
Borders	411	366	428	380	384	340	448	396	385	339	382	335	397	348	359	314
Highland	1,136	367	1,122	361	1,010	325	1,035	332	1,023	320	826	257	908	293	1,039	324
Orkney	67	337	59	296	85	423	61	303	91	423	67	311	70	324	71	328
Forth Valley	970	334	973	334	876	299	1,051	356	981	328	844	282	986	328	1,017	336
Tayside	1,614	407	1,670	418	1,544	383	1,440	355	1,352	328	1,314	319	1,411	341	1,437	346
Lanarkshire	2,302	410	2,081	370	1,976	351	2,083	370	2,197	384	2,041	313	2,379	364	2,269	347
Western Isles	96	366	101	386	71	271	75	288	90	327	80	292	91	334	94	347
Dumfries and Galloway	669	450	589	397	573	387	563	380	514	341	482	321	506	337	533	356
Ayrshire and Arran	1,660	425	1,521	414	1,545	421	1,570	428	1,315	352	1,287	346	1,357	366	1,371	370
Scotland	18,627	360	17,576	338	16,969	325	18,008	343	17,853	336	16,379	307	17,051	319	16,973	316

Table 11. Type 2 diabetes: Crude incidence rate for all ages (cases per 100,000 population per year) by NHS Board, ranked by rate in the last year.

NHS Board	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Shetland	238	287	337	338	366	227	220	328	331	254
Grampian	329	336	382	316	290	336	348	295	292	264
Lothian	310	281	270	241	262	268	273	247	241	282
Fife	352	363	363	357	338	371	381	373	292	306
Greater Glasgow and Clyde	322	348	338	330	316	341	342	335	352	313
Borders	380	384	366	380	340	396	339	335	348	314
Highland	335	348	367	361	325	332	320	257	283	324
Orkney	369	388	337	296	423	303	423	311	324	328
Forth Valley	320	330	334	334	299	356	328	282	328	336
Tayside	350	380	407	418	383	355	328	319	341	346
Lanarkshire	382	371	410	370	351	370	384	313	364	347
Western Isles	323	327	366	386	271	288	327	292	334	347
Dumfries and Galloway	359	378	450	397	387	380	341	321	337	356
Ayrshire and Arran	390	445	452	414	421	428	352	346	366	370
Scotland	339	350	360	338	325	343	336	307	319	316

Duration of Diabetes

The date of diagnosis was recorded for almost 100% of patients, of whom 6.1% have had diabetes for less than one year and 12.1% have a record of having had diabetes for 20 years or more (although it should be noted that not all dates of diagnosis are accurate, especially for those with long-standing diabetes).

Table 12. Duration of diabetes (years since diagnosis) by type of diabetes for people with Type 1 or Type 2 diabetes

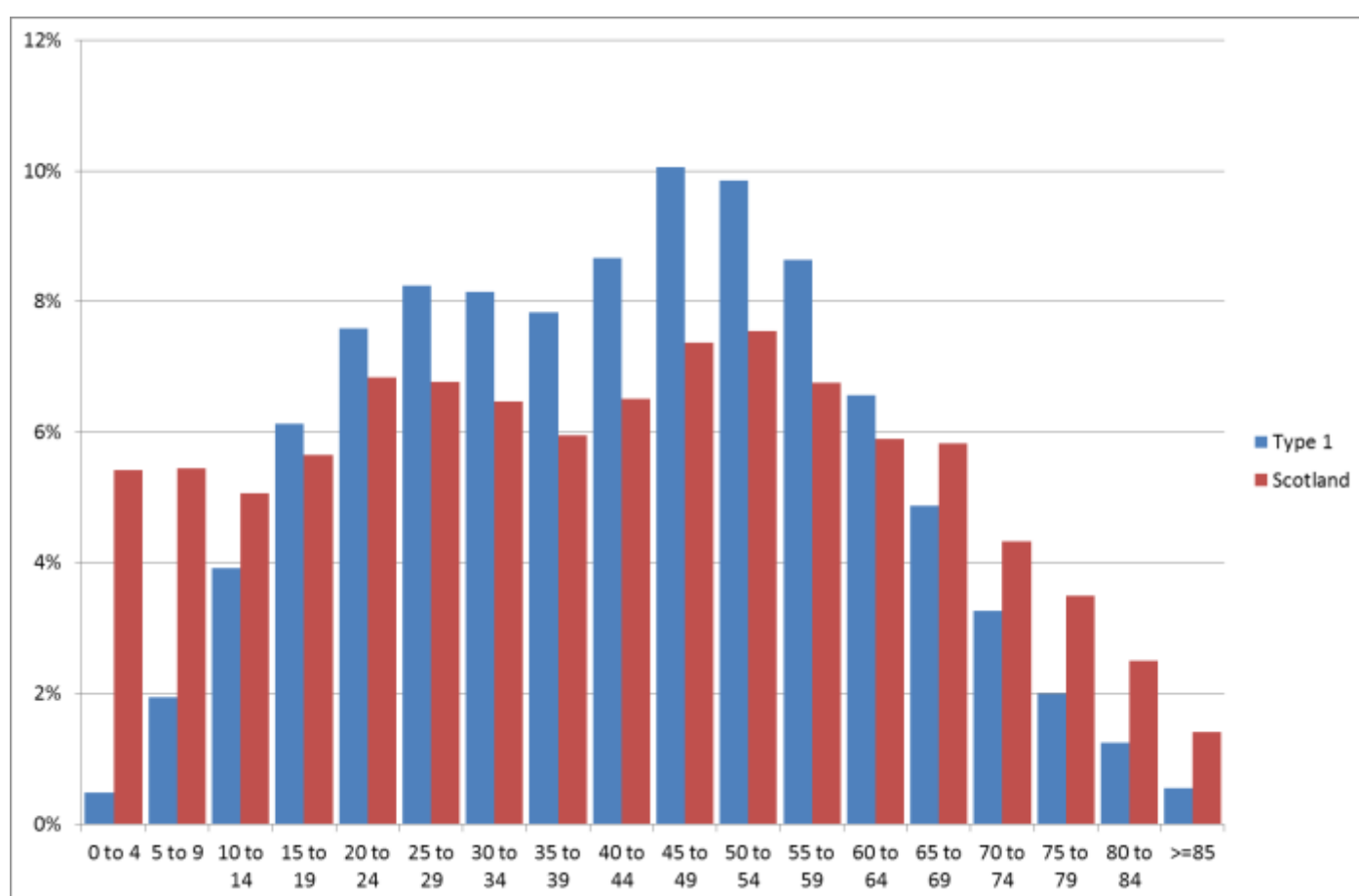
Duration (Years)	Type 1 diabetes		Type 2 diabetes		T1 and T2 diabetes	
	Number	%	Number	%	Total	Total %
<1	940	3.0	16,784	6.5	17,724	6.1
1-4	3,612	11.7	66,682	25.9	70,294	24.4
5-9	4,428	14.3	71,637	27.8	76,065	26.4
10-14	4,146	13.4	52,792	20.5	56,938	19.7
15-19	4,016	13.0	28,618	11.1	32,634	11.3
20-24	3,367	10.9	11,165	4.3	14,532	5.0
25-29	2,782	9.0	4,477	1.7	7,259	2.5
30-34	2,235	7.2	1,669	0.6	3,904	1.4
34-39	1,920	6.2	538	0.2	2,458	0.9
40-44	1,288	4.2	259	0.1	1,547	0.5
45-49	823	2.7	134	0.1	957	0.3
>=50	1,334	4.3	2,918	1.1	4,252	1.5
Total	30,891	100.0	257,673	100.0	288,564	100.0

Note: Excludes patients where date of diagnosis not known (Type 1 = 6; Type 2 = 55).

Age and Sex

Type 2 diabetes is more common in older people; 52.4% (153,028) of all people with diabetes recorded in the survey are aged 65 years or older (Table 2). Figures 5 and 6 show the age distribution of people with Type 1 and Type 2 diabetes compared with that of the general population; 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, due to the increased risk of developing diabetes related complications.

Figure 5. Type 1 diabetes: Age distribution of people recorded compared with age distribution of general population.



The difference between the age distributions is likely to relate to two factors. The first is the increasing incidence of Type 1 diabetes in young people and the second is the recognised decrease of life expectancy of those with Type 1 diabetes. A recent study of the Scottish Type 1 diabetes population (<http://dx.doi.org/10.1001/jama.2014.16425>) has shown that life expectancy, while reduced, is improved compared to older studies.

Figure 6. Type 2 diabetes: Age distribution of people recorded compared with age distribution of general population.

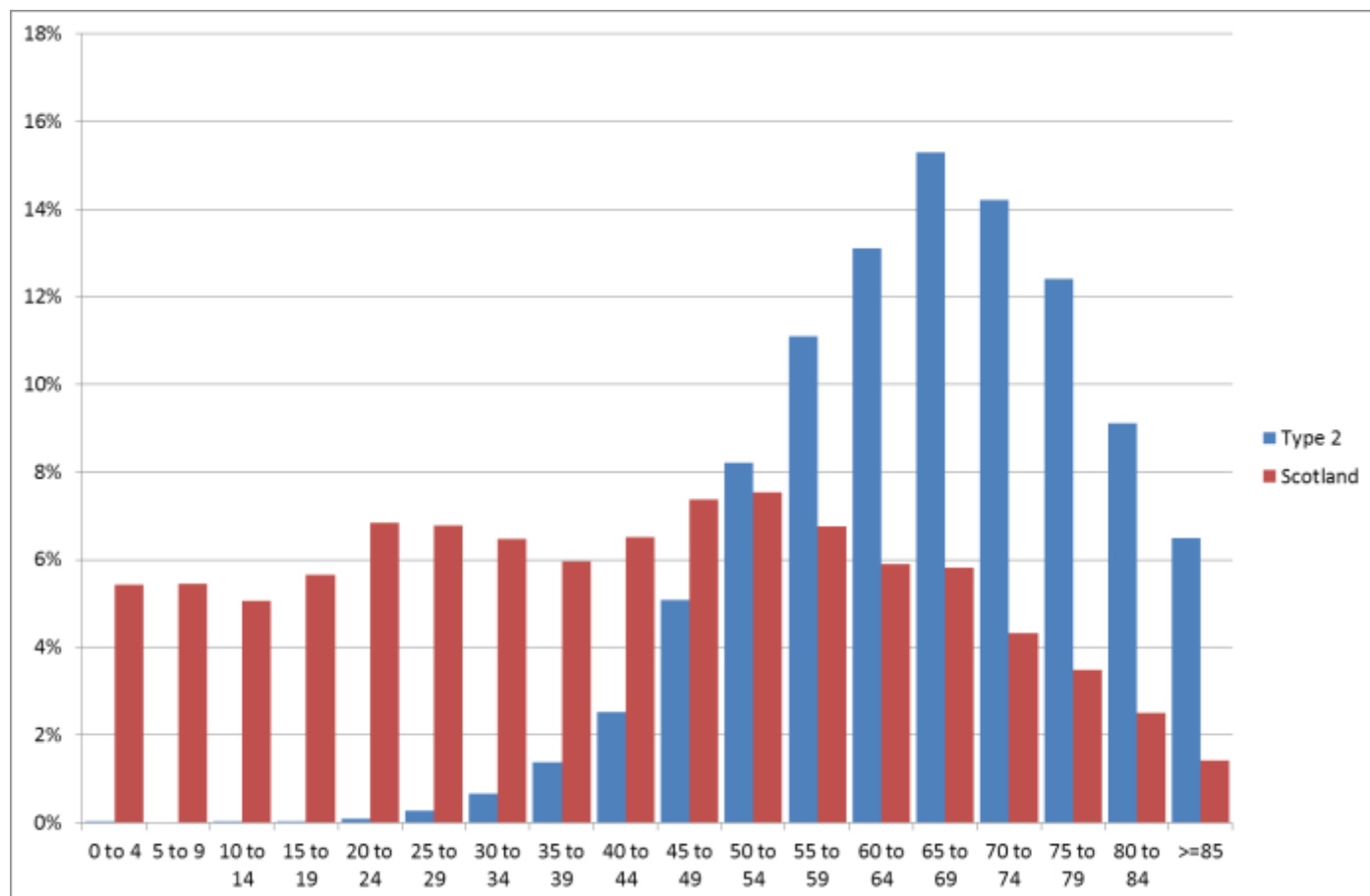


Table 13. Age group of people recorded with Type 1 or Type 2 diabetes, percentage in each age group and cumulative percentage in each age group, by diabetes type.

Age	Type 1 diabetes			Type 2 diabetes		
	Number	%	Cumulative Percentage (%)	Number	%	Cumulative Percentage (%)
0-4	150	0.5	0.5	0	0.0	0.0
5-9	599	1.9	2.4	0	0.0	0.0
10-14	1,209	3.9	6.3	11	0.0	0.0
15-19	1,893	6.1	12.5	52	0.0	0.0
20-24	2,344	7.6	20.1	245	0.1	0.1
25-29	2,546	8.2	28.3	718	0.3	0.4
30-34	2,514	8.1	36.5	1,712	0.7	1.1
35-39	2,418	7.8	44.3	3,555	1.4	2.4
40-44	2,676	8.7	53.0	6,497	2.5	5.0
45-49	3,107	10.1	63.0	13,076	5.1	10.0
50-54	3,040	9.8	72.9	21,165	8.2	18.3
55-59	2,669	8.6	81.5	28,594	11.1	29.4
60-64	2,025	6.6	88.1	33,759	13.1	42.5
65-69	1,506	4.9	93.0	39,419	15.3	57.8
70-74	1,006	3.3	96.2	36,628	14.2	72.0
75-79	616	2.0	98.2	31,978	12.4	84.4
80-84	383	1.2	99.4	23,483	9.1	93.5
>=85	171	0.6	100.0	16,735	6.5	100.0
Scotland	30,872	100.0	100.0	257,627	100.0	100.0

A greater proportion of those with diagnosed diabetes are male; 56.1% (17,318) of those with Type 1 diabetes and 56.0% (144,232) of those with Type 2 diabetes. This proportion has remained relatively stable since the survey started in 2001.

Mortality

Table 14. The number and crude percentage of the diabetic population (all diabetes types) who have died within the last year, by NHS Board, ranked by mortality.

NHS Board	Deaths	
	Total	% of population
Shetland	35	3.0
Borders	232	3.4
Lothian	1,445	3.5
Ayrshire and Arran	868	3.6
Fife	804	3.6
Lanarkshire	1,448	3.6
Grampian	1,081	3.7
Greater Glasgow and Clyde	2,407	3.7
Orkney	45	3.7
Forth Valley	648	3.7
Dumfries and Galloway	372	3.8
Highland	675	3.8
Tayside	931	3.9
Western Isles	58	3.9
Scotland	11,049	3.7

Note: These data were calculated from all people with diabetes who died in the prior year expressed as a percentage of all people with diabetes still alive at the end of the year plus those who died during the year. This does not take account of the fact that as people die during the year the size of the population that remains and is still at risk of death becomes very slightly smaller. As a result these figures slightly underestimate the true mortality risk. Also, note that comparisons between NHS Boards do not take into account important differences in age structure which result in higher mortality in boards with older populations.

Type of Diabetes

The majority of registered patients have Type 2 diabetes (257,728 or 88.3%). The proportion of people with diabetes who have a record of Type 1 diabetes has fallen from 18.2% in 2002 to 10.6% in 2016, probably largely due to 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; 29,261 in 2013 and 30,899 in 2016). This reflects the rising incidence of Type 1 diabetes in children and better survival over the last 40 years. Other types of diabetes include Maturity Onset Diabetes of the Young (MODY), gestational diabetes and secondary diabetes.

Figure 7 Proportions of diabetes population by type

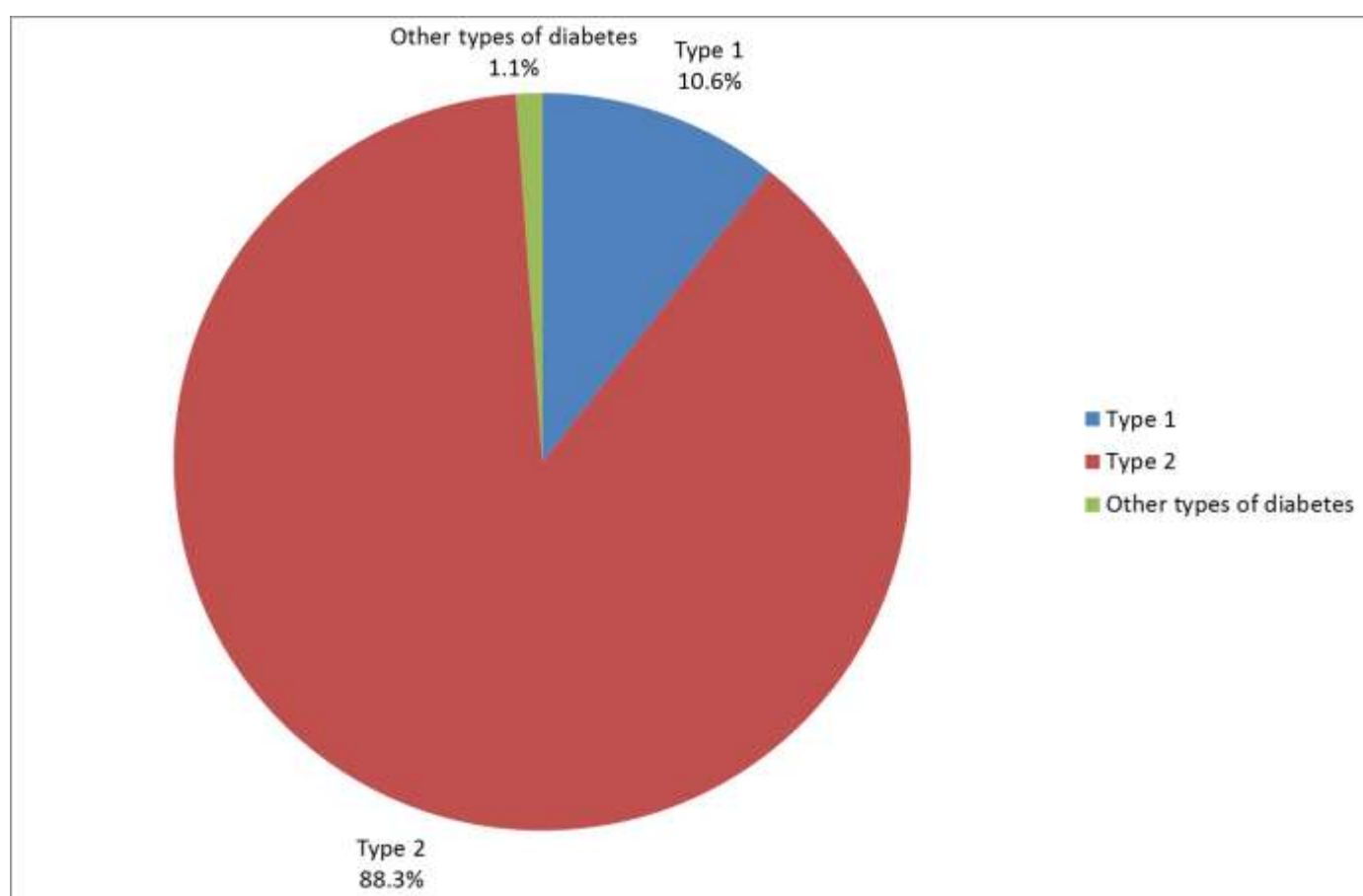


Table 15. Number of people with diabetes and the distribution of diabetes type, by NHS board, ranked by the percentage with Type 2 diabetes.

NHS Board	Type 1		Type 2		Other types of diabetes	Total
	n	%	n	%		
Western Isles	194	13.7	1,220	85.9	7	1,421
Lothian	4,709	11.7	34,748	86.4	740	40,197
Highland	1,995	11.7	14,789	86.5	316	17,100
Grampian	3,404	12.0	24,825	87.4	191	28,420
Shetland	131	11.7	986	87.8	6	1,123
Borders	693	10.4	5,878	87.8	123	6,694
Lanarkshire	4,143	10.7	34,069	88.1	459	38,671
Forth Valley	1,817	10.9	14,770	88.3	142	16,729
Dumfries and Galloway	950	10.1	8,352	88.7	110	9,412
Greater Glasgow and Clyde	6,287	10.0	55,838	88.8	749	62,874
Fife	2,104	9.8	19,119	89.4	166	21,389
Orkney	114	9.8	1,048	89.7	6	1,168
Ayrshire and Arran	2,271	9.7	21,123	89.9	95	23,489
Tayside	2,087	9.0	20,963	90.0	244	23,294
Scotland	30,899	10.6	257,728	88.3	3,354	291,981

Note: Percentages (of the total diabetes population) have been calculated for Type 1 and Type 2 diabetes only.

The net slight drop in the number of people with Type 1 and Type 2 diabetes in the Greater Glasgow and Clyde Health Board since the 2014 survey (6,404 and 54,757 people respectively in 2014 to 6,287 and 55,838 in 2016, See Table 15) is likely mostly due to the change in boundaries moving patients from it to the Lanarkshire Health Board (<http://www.nhslanarkshire.org.uk/Involved/consultation/boundaries/Pages/default.aspx>) during 2014. During the same period the number of people in the Lanarkshire Health Board with Type 1 and Type 2 diabetes rose quickly (from 3,758 and 29,925 people respectively in 2014 to 4,143 and 34,069 in 2016 respectively).

Note: The remainder of this report focuses on Type 1 and Type 2 diabetes and excludes other types.

Ethnicity

Information on ethnic group was available for 81.7% of the registered population with Type 1 and Type 2 diabetes (Table 19). The completeness of this information increased from 33.3% in 2007, to 81.7% in 2016. Type 2 diabetes is much more common in South Asian than White ethnic groups, and tends to present at an earlier age.

Table 16. Type 1 diabetes: Completeness of recording of ethnic group by NHS board, ranked by decreasing completeness.

NHS Board	Ethnic group identified	
	Number	Percentage (%)
Dumfries and Galloway	926	97.5
Shetland	126	96.2
Forth Valley	1,711	94.2
Greater Glasgow and Clyde	5,848	93.0
Borders	644	92.9
Lothian	4,367	92.7
Fife	1,916	91.1
Lanarkshire	3,605	87.0
Highland	1,623	81.4
Tayside	1,641	78.6
Orkney	89	78.1
Grampian	2,364	69.4
Western Isles	134	69.1
Ayrshire and Arran	1,526	67.2
Scotland	26,520	85.8

Table 17. Type 2 diabetes: Completeness of recording of ethnic group by NHS board, ranked by decreasing completeness.

NHS Board	Ethnic group identified	
	Number	Percentage (%)
Dumfries and Galloway	8,156	97.7
Shetland	947	96.0
Greater Glasgow and Clyde	52,903	94.7
Borders	5,398	91.8
Lanarkshire	29,612	86.9
Forth Valley	12,715	86.1
Lothian	29,772	85.7
Fife	16,137	84.4
Highland	11,771	79.6
Orkney	777	74.1
Tayside	13,863	66.1
Grampian	15,452	62.2
Ayrshire and Arran	11,126	52.7
Western Isles	592	48.5
Scotland	209,221	81.2

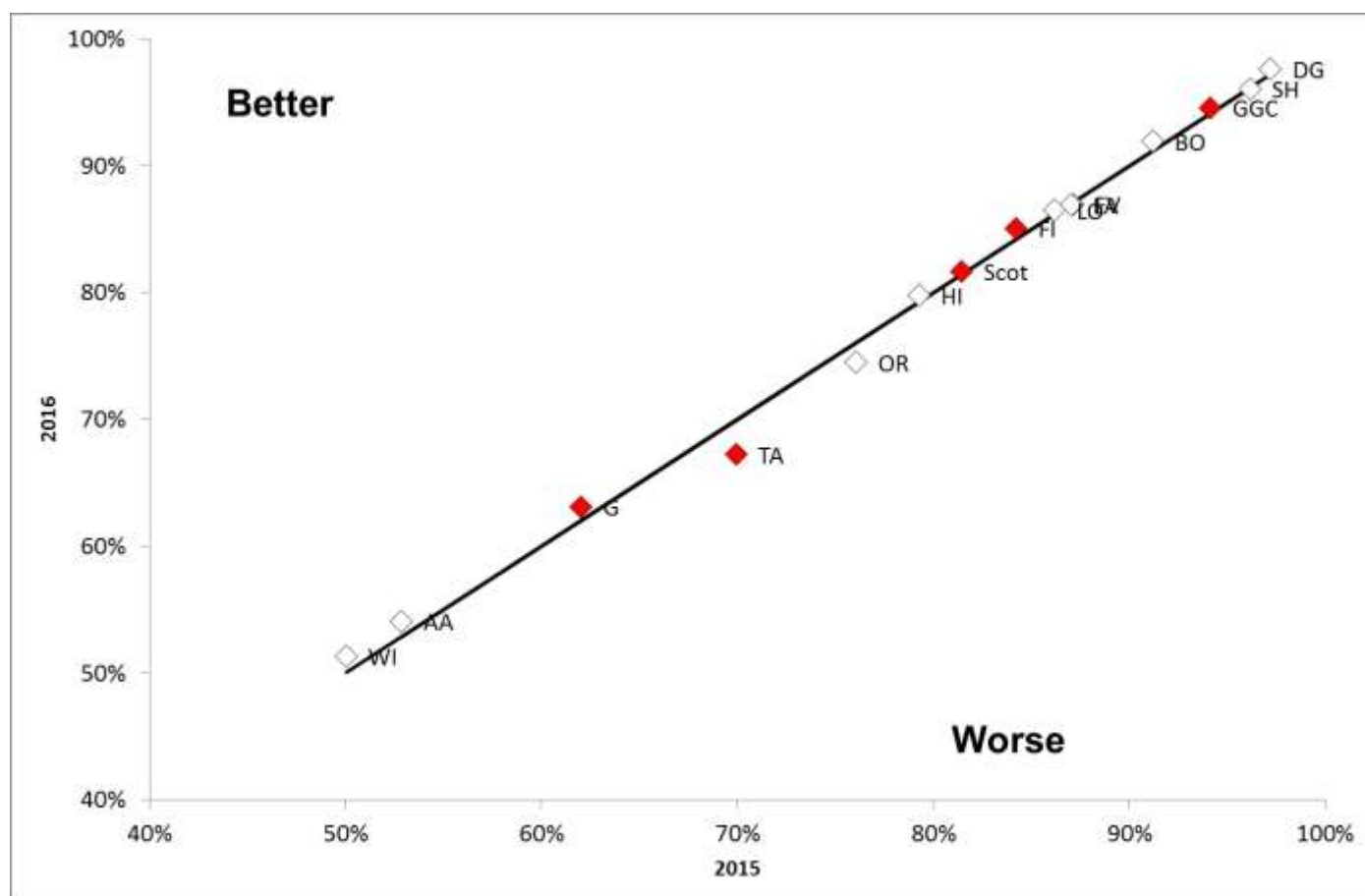
Table 18. Recorded ethnic group for Type 1, Type 2 and combined types.

Ethnic group	Type 1		Type 2		Type 1 and 2	
	Number	%	Number	%	Number	%
A - White	25,297	81.9	191,722	74.4	217,019	75.2
B - Mixed or multiple ethnic groups	602	1.9	6,423	2.5	7,025	2.4
C - Asian, Asian Scottish or Asian British	345	1.1	8,716	3.4	9,061	3.1
D - African, Caribbean or Black	124	0.4	993	0.4	1,117	0.4
E - Other ethnic group	152	0.5	1,367	0.5	1,519	0.5
Not recorded	4,379	14.2	48,507	18.8	52,886	18.3

Table 19. Completeness of recording of ethnic group for people with diabetes (Type 1 and Type 2 combined).

Year	Identified (n)	Identified (%)
2016	235,741	81.7
2015	228,993	81.4
2014	222,041	81.1
2013	210,682	79.2
2012	199,587	77.7
2011	190,397	77.5
2010	164,370	69.6
2009	126,997	56.0
2008	94,925	43.2
2007	69,875	33.3

Figure 8. Completeness of recording of ethnic group from 2015 to 2016 for people recorded as having Type 1 or Type 2 diabetes (combined)



Note: Points in red indicate statistically significant change. The diagonal line shows no change between 2015 and 2016. If any board has changed by more than 4% between 2015 and 2016, arrows showing the direction of change have been added.

Body Mass Index

Body Mass Index (BMI) was recorded for 84.6% of patients with Type 1 or Type 2 diabetes in the previous 15 months (Table 21). This is a slight decrease from 86.5% from 2015 and 89.2% recorded in 2012. Of those with a record of BMI (Tables 22 and 23), 32.1% were overweight (BMI 25-29.9kg/m²) and 52.8% were obese (BMI 30kg/m² or over).

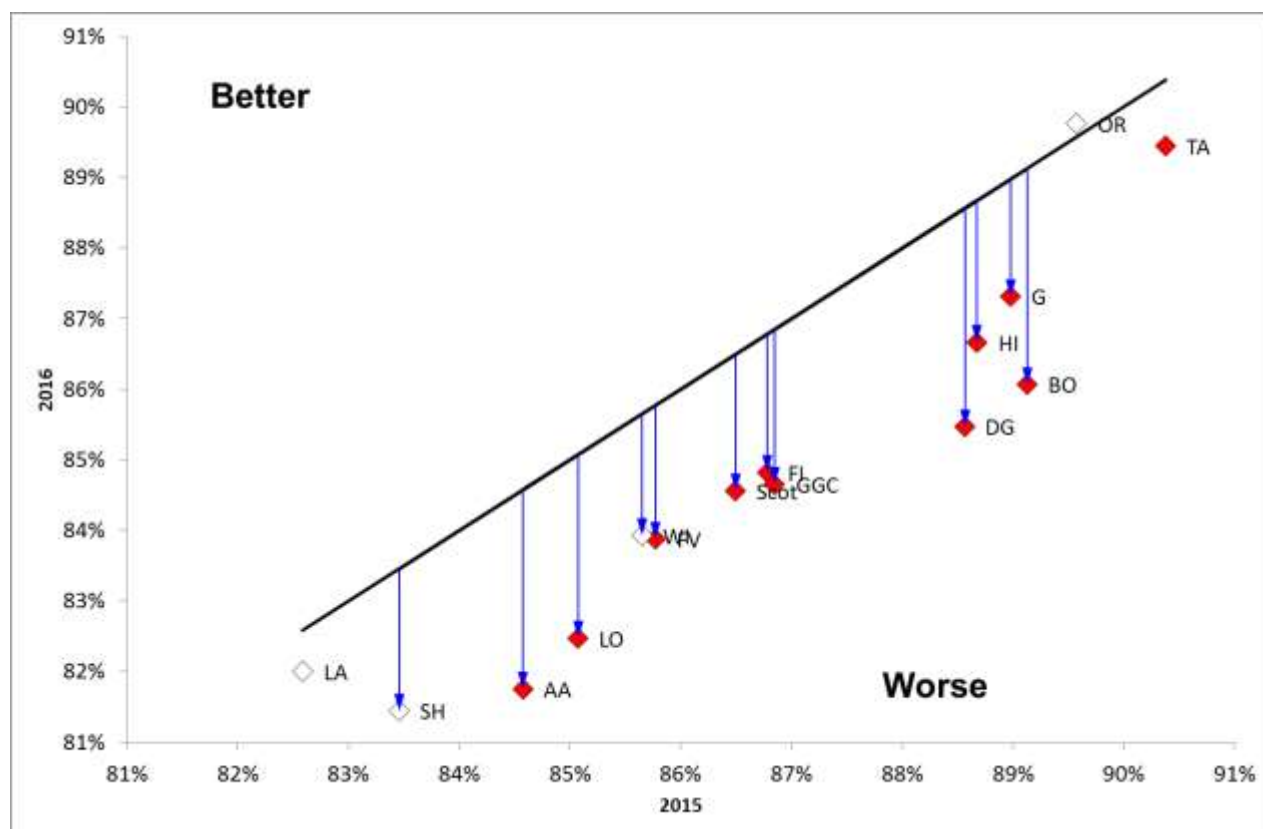
Despite Type 2 diabetes being more prevalent in obese patients, 12.3% of those with Type 2 diabetes had normal weight (BMI 18.5-24.9kg/m²), 31.6% were overweight (BMI 25-29.9 kg/m²) and 55.6% were obese (BMI 30kg/m² or over).

Table 20. Proportion of people recorded as having Type 1 or Type 2 diabetes with a record of BMI within the previous 15 months, by NHS Board and diabetes type, ranked by decreasing completeness for Type 2 diabetes.

NHS Board	BMI recorded (%)		Total recorded	Total not recorded
	Type 1 diabetes	Type 2 diabetes		
Orkney	87.6	90.0	1,035	118
Tayside	88.4	89.5	20,438	2,411
Highland	80.9	87.4	14,354	2,209
Grampian	87.2	87.3	24,350	3,537
Borders	86.8	86.0	5,598	906
Dumfries and Galloway	87.5	85.3	7,865	1,337
Greater Glasgow and Clyde	82.5	84.9	52,098	9,446
Western Isles	77.6	84.8	1,170	224
Fife	86.2	84.7	17,830	3,191
Forth Valley	82.9	84.0	13,749	2,642
Lothian	84.8	82.2	32,201	6,843
Lanarkshire	81.0	82.1	30,886	6,777
Shetland	76.5	82.0	900	205
Ayrshire and Arran	78.9	82.0	18,915	4,222
Scotland	83.7	84.7	241,389	44,068

Note: Excludes patients under 18 years of age and patients whose date of birth has not been recorded (Type 1 n = 3040, Type 2 n = 130)

Figure 9. Proportion of people recorded as having Type 1 or Type 2 diabetes (combined) who had a record of BMI from 2015 to 2016



Note: Arrows showing the direction of change have been added for all boards with more than 1.5% change between 2015 and 2016. Points in red indicate statistically significant change. The diagonal line shows no change between 2015 and 2016.

Table 21. Proportion of people with Type 1 or Type 2 diabetes (combined) with a record of BMI in the previous 15 months.

Year	BMI recorded (%)
2016	84.6
2015	86.5
2014	87.7
2013	88.7
2012	89.2
2011	88.7
2010	82.0
2009	89.7
2008	87.4
2007	85.3

Note: Excludes patients under 18 years of age and patients whose date of birth has not been recorded (n = 3170)

Table 22. Type 1 diabetes: Percentage of people with a record of BMI in the last 15 months grouped by BMI category, NHS board and ranked in from low to high by percentage with BMI $\geq 40\text{kg/m}^2$

NHS Board	BMI (kg/m ² ,%)						Total recorded	Not recorded
	Underweight	Normal	Overweight	Obese				
	<18.5	18.5-24.9	25-29.9	30-34.9	35-39.9	≥40		
Shetland	0.0	28.6	34.1	26.4	11.0	0.0	91	28
Western Isles	1.5	35.6	43.0	14.1	5.2	0.7	135	39
Greater Glasgow and Clyde	2.1	37.1	36.6	17.2	5.0	2.1	4,721	999
Forth Valley	1.6	36.2	37.2	17.7	5.1	2.2	1,349	278
Tayside	1.5	34.0	38.8	17.8	5.4	2.4	1,670	219
Lothian	2.4	36.8	37.6	15.4	5.4	2.4	3,652	656
Lanarkshire	2.4	33.4	35.9	20.1	5.6	2.7	2,968	698
Highland	1.6	34.2	38.5	17.5	5.5	2.7	1,438	339
Fife	1.3	31.6	38.5	19.5	6.4	2.7	1,648	263
Ayrshire and Arran	2.1	34.0	35.9	18.4	6.8	2.8	1,589	426
Orkney	0.0	34.8	34.8	16.3	10.9	3.3	92	13
Grampian	1.3	34.3	38.2	17.9	5.0	3.3	2,673	391
Borders	0.9	28.8	37.8	21.1	8.1	3.3	545	83
Dumfries and Galloway	1.1	34.8	36.2	19.1	5.2	3.6	749	107
Scotland	1.9	34.9	37.3	17.9	5.5	2.6	23,320	4,539

Note: Excludes patients under 18 years of age and patients whose date of birth has not been recorded (n = 3040).

Table 23. Type 2 diabetes: Percentage of people with a record of BMI in the last 15 months grouped by BMI category, NHS board and ranked by percentage with BMI $\geq 40\text{kg/m}^2$

NHS Board	BMI (kg/m ² , %)						Total recorded	Not recorded
	Underweight	Normal	Overweight	Obese				
	<18.5	18.5-24.9	25-29.9	30-34.9	35-39.9	≥40		
Greater Glasgow and Clyde	0.6	13.5	33.0	29.0	14.4	9.6	47,377	8,447
Tayside	0.5	12.2	31.7	30.1	15.6	10.0	18,768	2,192
Western Isles	0.1	11.2	32.3	30.1	16.2	10.0	1,035	185
Highland	0.4	11.8	32.3	30.4	15.1	10.0	12,916	1,870
Grampian	0.4	12.1	31.8	30.3	15.2	10.1	21,677	3,146
Borders	0.5	12.5	32.9	27.9	16.0	10.2	5,053	823
Ayrshire and Arran	0.5	12.8	31.3	29.4	15.6	10.4	17,326	3,796
Lanarkshire	0.6	11.8	30.9	30.0	16.0	10.8	27,918	6,079
Lothian	0.6	12.2	30.8	29.7	15.6	11.0	28,549	6,187
Dumfries and Galloway	0.5	11.9	30.6	30.0	15.8	11.1	7,116	1,230
Forth Valley	0.4	11.1	31.0	29.8	16.2	11.6	12,400	2,364
Orkney	0.1	10.3	33.0	30.0	14.4	12.2	943	105
Fife	0.5	10.9	29.8	29.0	17.3	12.5	16,182	2,928
Shetland	0.2	9.9	25.6	31.4	18.8	14.1	809	177
Scotland	0.5	12.3	31.6	29.6	15.5	10.5	218,069	39,529

Note: Excludes children under 18 years of age or who have no recorded date of birth (n = 130).

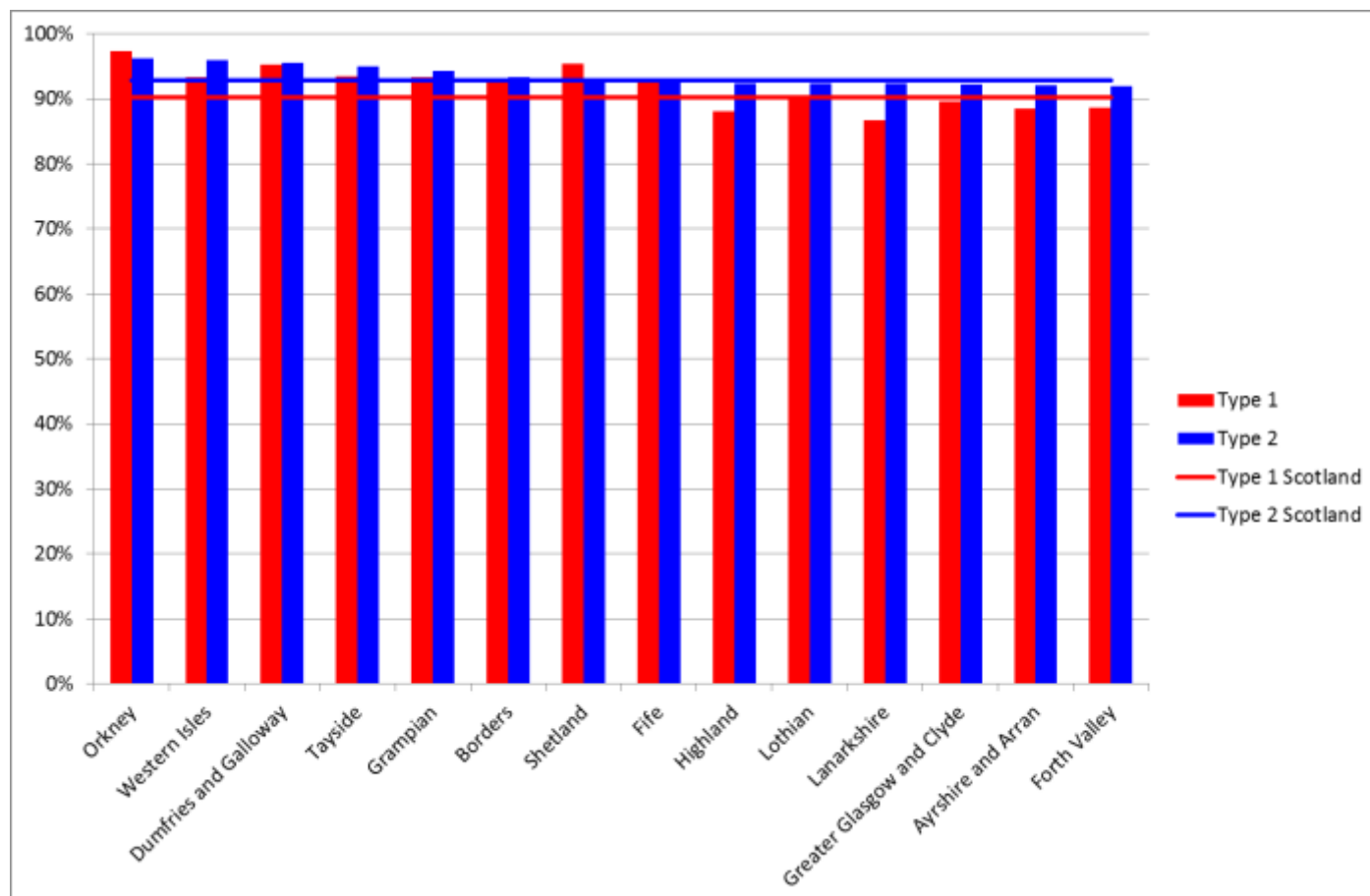
Glycaemic Control

92.6% of patients with Type 1 or Type 2 diabetes had an HbA_{1c} recorded in the previous 15 months (Table 24). In 55% of patients with a recorded result, HbA_{1c} was less than 58mmol/mol, suggesting reasonable control of diabetes (Tables 26 and 27). While all laboratories in Scotland are using a standardised (IFCC aligned) HbA_{1c} assay, there are some slight differences in actual results between laboratories and some concern remains about comparability. This should be considered when comparing results from different health board areas. It should be noted that HbA_{1c} is higher in the winter with an average variability of around 6mmol/mol. This is described in more detail in Appendix 3.

Table 24. Percentage of people recorded as having Type 1 or Type 2 diabetes (combined) with a record of HbA_{1c} in previous 15 months.

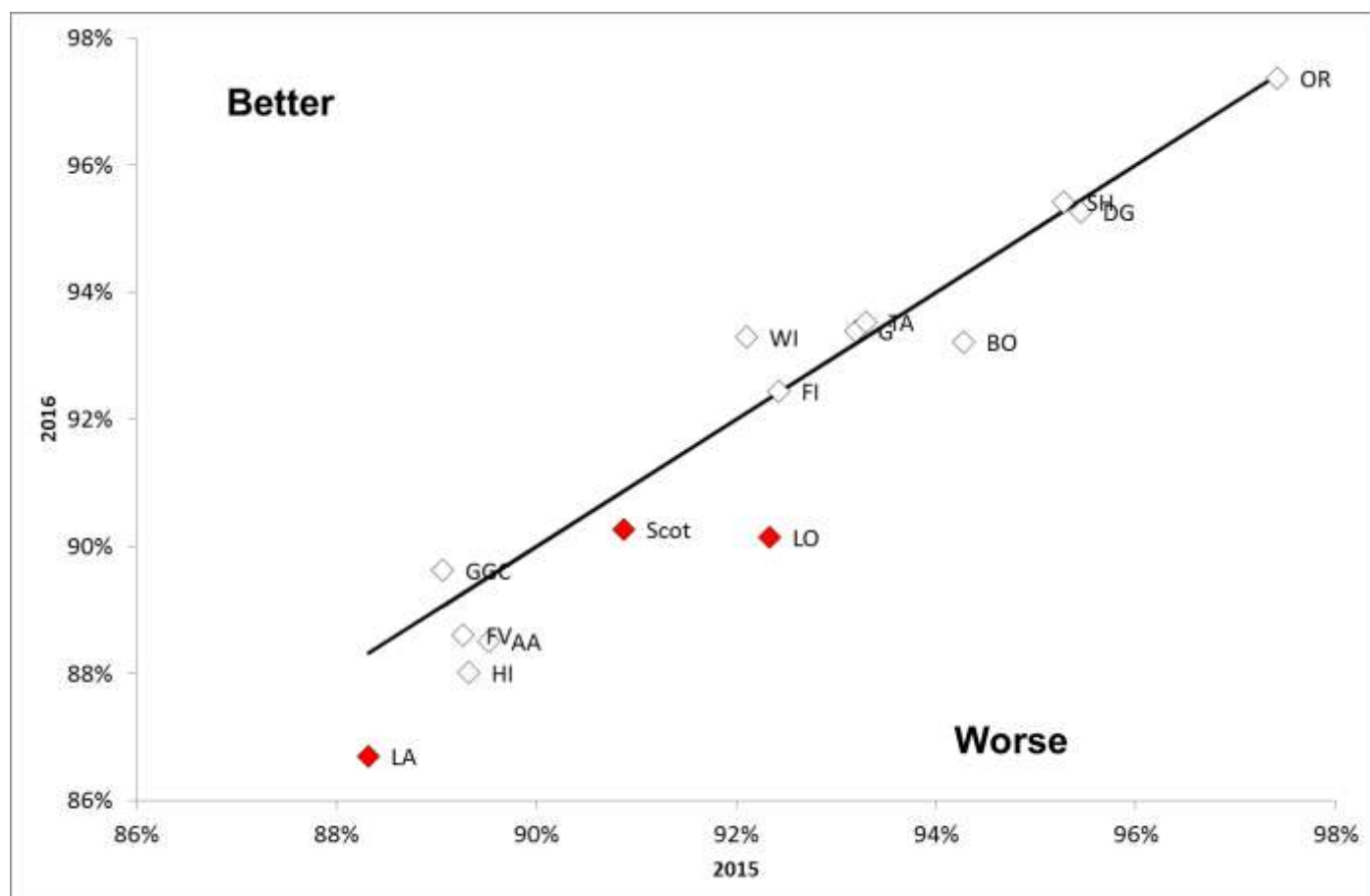
Year	Recorded within previous 15 months (%)
2016	92.6
2015	93.5
2014	94.0
2013	93.3
2012	92.1
2011	91.1
2010	91.4
2009	89.5
2008	89.8
2007	88.7

Figure 10. Percentage of patients with Type 1 or Type 2 diabetes with a recording of HbA1c within the previous 15 months by NHS Board and diabetes type



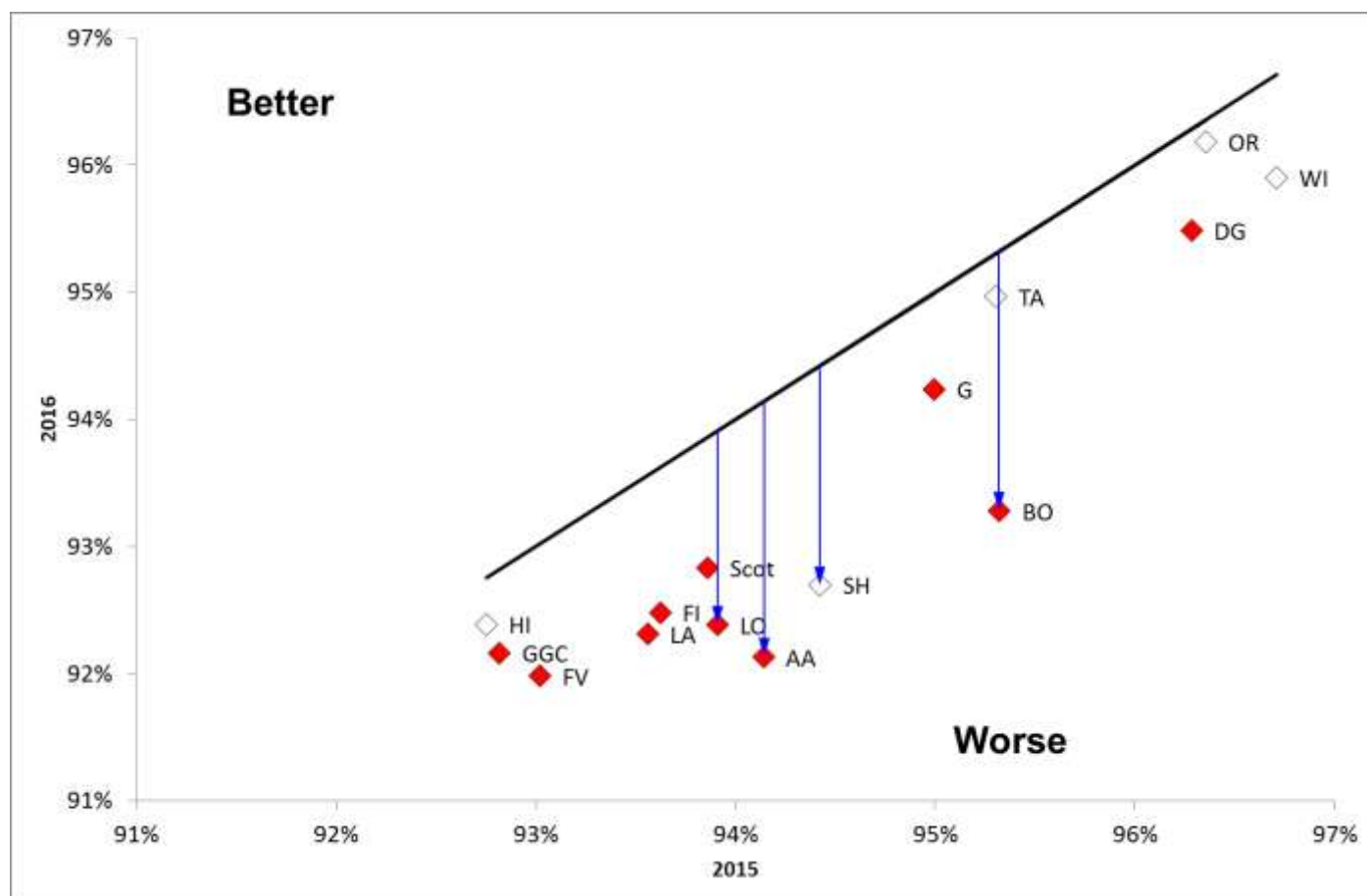
Note: Horizontal lines show figures for Scotland as a whole and bars are ranked by figures for Type 2 diabetes

Figure 11. Proportion of people with Type 1 diabetes who had a record of HbA1c from 2015 to 2016.



Note: Arrows showing the direction of change have been added for all boards with more than 3.5% change over that period. Points in red indicate statistically significant change. The diagonal line shows no change between 2015 and 2016.

Figure 12. Proportion of people with Type 2 diabetes who had a record of HbA1c from 2015 to 2016.



Note: Arrows showing the direction of change have been added for all boards with more than 1.5% change over that period. Points in red indicate statistically significant change. The diagonal line shows no change between 2015 and 2016.

Table 25. Percentage of people with Type 1 or Type 2 diabetes who had a record of HbA_{1c} within the previous 15 months, by diabetes type and NHS board, ranked by decreasing percentage of people with Type 2 diabetes.

NHS Board	Type 1 diabetes			Type 2 diabetes			Total recorded
	Recorded within previous 15 months		Not recorded	Recorded within previous 15 months		Not recorded	
	n	%		n	%		
Orkney	111	97.4	3	1,008	96.2	40	1,119
Western Isles	181	93.3	13	1,170	95.9	50	1,351
Dumfries and Galloway	905	95.3	45	7,975	95.5	377	8,880
Tayside	1,952	93.5	135	19,908	95.0	1,055	21,860
Grampian	3,179	93.4	225	23,394	94.2	1,431	26,573
Borders	646	93.2	47	5,484	93.3	394	6,130
Shetland	125	95.4	6	914	92.7	72	1,039
Fife	1,945	92.4	159	17,681	92.5	1,438	19,626
Highland	1,756	88.0	239	13,663	92.4	1,126	15,419
Lothian	4,245	90.1	464	32,102	92.4	2,646	36,347
Lanarkshire	3,592	86.7	551	31,450	92.3	2,619	35,042
Greater Glasgow and Clyde	5,635	89.6	652	51,461	92.2	4,377	57,096
Ayrshire and Arran	2,010	88.5	261	19,461	92.1	1,662	21,471
Forth Valley	1,610	88.6	207	13,586	92.0	1,184	15,196
Scotland	27,892	90.3	3,007	239,257	92.8	18,471	267,149

Figure 13. Type 1 diabetes: Percentage of people in each HbA_{1c} category for HbA_{1c} recorded in the previous 15 months, by NHS Board, ranked by decreasing percentage with HbA_{1c} under 58 mmol/mol.

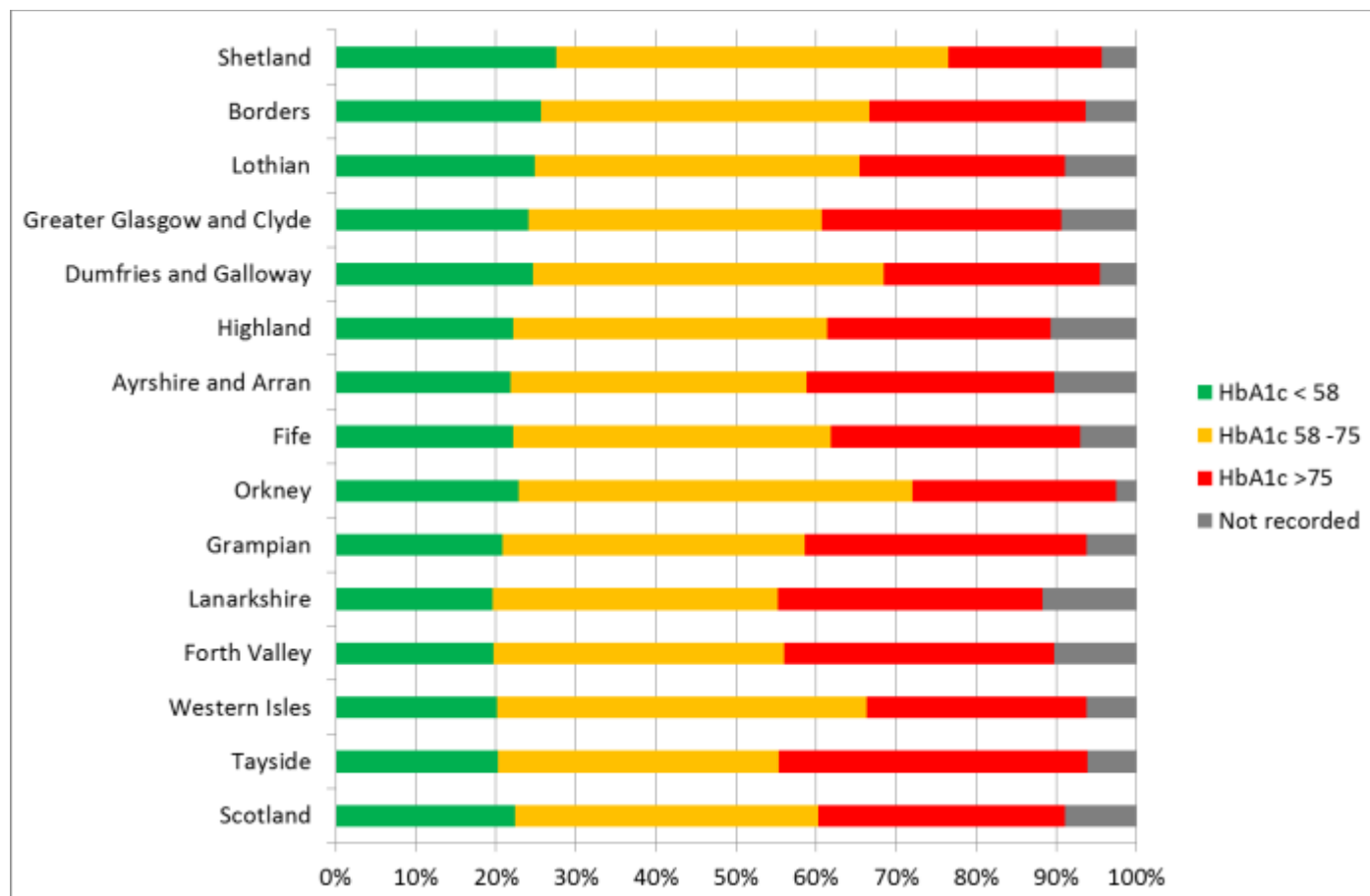


Figure 14. Type 2 diabetes: Percentage of people in each HbA_{1c} category for HbA_{1c} recorded in the previous 15 months, by NHS Board, ranked by decreasing percentage with HbA_{1c} under 58mmol/mol.

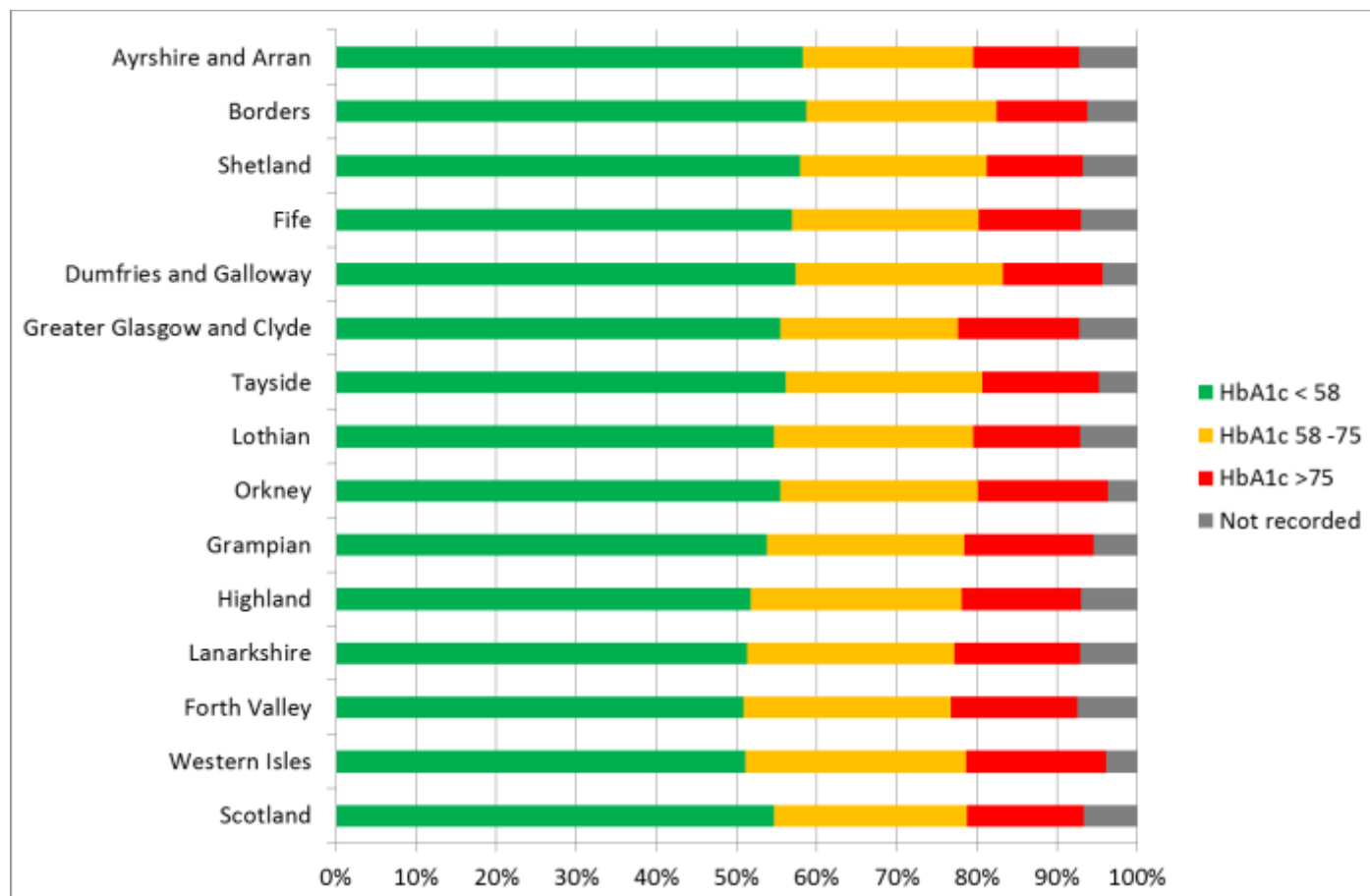


Table 26. Type 1 diabetes: HbA_{1c} category as a percentage of patients with HbA_{1c} recorded in previous 15 months, by NHS Board, ranked by percentage with HbA_{1c} over 75mmol/mol.

NHS Board	HbA1c (mmol/mol)						Total recorded	Not recorded
	< 58		58 -75		>75			
	n	%	n	%	n	%		
Shetland	36	28.8%	64	51.2%	25	20.0%	125	6
Borders	177	27.4%	283	43.8%	186	28.8%	646	47
Lothian	1,158	27.3%	1,891	44.5%	1,196	28.2%	4,245	464
Greater Glasgow and Clyde	1,500	26.6%	2,273	40.3%	1,862	33.0%	5,635	652
Dumfries and Galloway	233	25.7%	416	46.0%	256	28.3%	905	45
Highland	436	24.8%	772	44.0%	548	31.2%	1,756	239
Ayrshire and Arran	489	24.3%	830	41.3%	691	34.4%	2,010	261
Fife	463	23.8%	830	42.7%	652	33.5%	1,945	159
Orkney	26	23.4%	56	50.5%	29	26.1%	111	3
Grampian	707	22.2%	1,277	40.2%	1,195	37.6%	3,179	225
Lanarkshire	798	22.2%	1,447	40.3%	1,347	37.5%	3,592	551
Forth Valley	353	21.9%	652	40.5%	605	37.6%	1,610	207
Western Isles	39	21.5%	89	49.2%	53	29.3%	181	13
Tayside	420	21.5%	729	37.3%	803	41.1%	1,952	135
Scotland	6,835	24.5	11,609	41.6	9,448	33.9	27,892	3,007

Table 27. Type 2 diabetes: HbA_{1c} category as percentage of patients with HbA_{1c} recorded in previous 15 months, by NHS Board, ranked by percentage with HbA_{1c} over 75mmol/mol.

NHS Board	HbA1c (mmol/mol)						Total recorded	Not recorded
	< 58		58 -75		>75			
	n	%	n	%	n	%		
Ayrshire and Arran	12,231	62.8	4,458	22.9	2,772	14.2	19,461	1,662
Borders	3,433	62.6	1,394	25.4	657	12.0	5,484	394
Shetland	568	62.1	228	24.9	118	12.9	914	72
Fife	10,823	61.2	4,419	25.0	2,439	13.8	17,681	1,438
Dumfries and Galloway	4,783	60.0	2,158	27.1	1,034	13.0	7,975	377
Greater Glasgow and Clyde	30,758	59.8	12,352	24.0	8,351	16.2	51,461	4,377
Tayside	11,745	59.0	5,120	25.7	3,043	15.3	19,908	1,055
Lothian	18,892	58.8	8,582	26.7	4,628	14.4	32,102	2,646
Orkney	580	57.5	258	25.6	170	16.9	1,008	40
Grampian	13,313	56.9	6,099	26.1	3,982	17.0	23,394	1,431
Highland	7,606	55.7	3,868	28.3	2,189	16.0	13,663	1,126
Lanarkshire	17,374	55.2	8,753	27.8	5,323	16.9	31,450	2,619
Forth Valley	7,457	54.9	3,807	28.0	2,322	17.1	13,586	1,184
Western Isles	622	53.2	336	28.7	212	18.1	1,170	50
Scotland	140,185	58.6	61,832	25.8	37,240	15.6	239,257	18,471

Table 28. Type 1 diabetes: Number and percentage of people with a record of HbA_{1c} in each HbA_{1c} category.

Year	HbA1c (mmol/mol)						Total recorded	Not recorded
	< 58		58-75		>75			
	n	%	n	%	n	%		
2016	6,835	24.5	11,609	41.6	9,448	33.9	27,892	3,007
2015	6,099	22.1	11,400	41.3	10,087	36.6	27,586	2,770
2014	6,375	23.4	11,107	40.8	9,714	35.7	27,196	2,606
2013	5,578	21.5	10,595	40.8	9,788	37.1	25,961	3,300
2012	5,407	21.5	9,830	39.1	9,881	39.3	25,118	3,731
2011	5,345	22.0	9,893	40.7	9,071	37.3	24,309	3,963
2010	5,337	21.8	9,754	39.9	9,375	38.3	24,466	3,444
2009	5,194	21.8	9,556	40.1	9,096	38.1	23,846	3,521

Table 29. Type 2 diabetes: Number and percentage of people with a record of HbA_{1c} in each HbA_{1c} category.

Year	HbA1c (mmol/mol)						Total recorded	Not recorded
	< 58		58-75		>75			
	n	%	n	%	n	%		
2016	140,185	58.6	61,832	25.8	37,240	15.6	239,257	18,471
2015	136,132	57.8	61,509	26.1	37,836	16.1	235,477	15,405
2014	141,426	61.4	54,780	23.8	33,981	14.8	230,187	13,863
2013	135,767	61.1	53,972	24.3	32,426	14.6	222,165	14,440
2012	126,141	59.7	52,547	24.8	32,775	15.5	211,463	16,504
2011	123,974	62.1	46,475	23.3	29,177	14.6	199,626	17,888
2010	122,563	64.0	42,603	22.3	26,264	13.7	191,430	16,849
2009	114,281	63.8	40,537	22.6	24,234	13.5	179,052	20,212

Table 30. Type 1 diabetes: HbA_{1c} category as percent of all those with HbA_{1c} recorded in the previous 15 months (HbA_{1c} in mmol/mol), by NHS Board, ranked by percentage with HbA_{1c} over 75mmol/mol.

NHS Board	HbA _{1c} (mmol/mol, %)						Total recorded	Not recorded
	< 53	53-57	58-63	64-68	69-75	> 75		
Shetland	15.2	13.6	20.8	18.4	12.0	20.0	125	6
Orkney	9.9	13.5	25.2	15.3	9.9	26.1	111	3
Lothian	15.6	11.7	17.2	13.2	14.2	28.2	4,245	464
Dumfries and Galloway	15.8	9.9	17.8	13.8	14.4	28.3	905	45
Borders	16.1	11.3	16.4	14.2	13.2	28.8	646	47
Western Isles	11.6	9.9	16.0	16.0	17.1	29.3	181	13
Highland	13.2	11.6	16.1	13.4	14.5	31.2	1,756	239
Greater Glasgow and Clyde	15.8	10.9	14.6	12.6	13.2	33.0	5,635	652
Fife	13.7	10.1	16.1	14.1	12.5	33.5	1,945	159
Ayrshire and Arran	13.6	10.7	14.1	14.4	12.7	34.4	2,010	261
Lanarkshire	12.2	10.0	14.4	12.6	13.3	37.5	3,592	551
Forth Valley	12.9	9.1	14.0	12.7	13.8	37.6	1,610	207
Grampian	12.4	9.9	13.7	13.4	13.0	37.6	3,179	225
Tayside	11.1	10.4	12.0	13.4	11.9	41.1	1,952	135
Scotland	13.9	10.6	15.0	13.3	13.3	33.9	27,892	3,007

Table 31. Type 2 diabetes: HbA_{1c} category as percent of all those with HbA_{1c} recorded in the previous 15 months (HbA_{1c} in mmol/mol), by NHS Board, 2014, ranked by percentage with HbA_{1c} over 75 mmol/mol.

NHS Board	HbA _{1c} (mmol/mol, %)						Total recorded	Not recorded
	< 53	53-57	58-63	64-68	69-75	> 75		
Borders	48.0	14.6	12.7	7.1	5.6	12.0	5,484	394
Shetland	51.0	11.2	12.9	6.7	5.4	12.9	914	72
Dumfries and Galloway	45.0	15.0	13.7	7.3	6.1	13.0	7,975	377
Fife	46.0	15.3	12.3	6.9	5.8	13.8	17,681	1,438
Ayrshire and Arran	47.8	15.0	11.0	6.8	5.0	14.2	19,461	1,662
Lothian	44.4	14.5	13.1	7.5	6.2	14.4	32,102	2,646
Tayside	42.9	16.1	11.7	8.3	5.7	15.3	19,908	1,055
Highland	40.0	15.7	13.7	8.0	6.7	16.0	13,663	1,126
Greater Glasgow and Clyde	46.3	13.5	11.4	6.6	6.0	16.2	51,461	4,377
Orkney	44.9	12.6	12.5	7.5	5.6	16.9	1,008	40
Lanarkshire	39.9	15.3	13.5	7.7	6.7	16.9	31,450	2,619
Grampian	42.9	14.0	11.9	7.7	6.5	17.0	23,394	1,431
Forth Valley	39.7	15.2	13.4	8.1	6.6	17.1	13,586	1,184
Western Isles	38.5	14.7	13.3	7.1	8.3	18.1	1,170	50
Scotland	43.9	14.7	12.4	7.3	6.1	15.6	239,257	18,471

Table 32. Mean HbA_{1c} (mmol/mol) recorded in the previous 15 months, by NHS Board, for people with Type 1 diabetes by age and for Type 2 diabetes (all ages combined), ranked by mean HbA_{1c} for those with Type 2 diabetes.

NHS Board	Type 1 diabetes: Age in years											Type 2 diabetes (all ages)
	0-4	5-9	10-14	15-19	20-24	25-29	30-39	40-49	50-59	60-79	>79	
Shetland	0	68	60	62	89	77	64	65	65	60	0	56
Ayrshire and Arran	60	61	64	77	77	77	70	71	70	65	70	57
Borders	61	59	61	71	74	76	68	72	68	65	67	57
Dumfries and Galloway	67	60	61	75	79	77	70	68	66	64	66	58
Fife	63	62	70	75	76	70	69	70	70	65	67	58
Greater Glasgow and Clyde	56	58	63	71	76	71	69	71	71	67	71	58
Lothian	58	61	64	76	71	71	67	68	68	65	66	58
Grampian	56	62	65	80	76	73	70	72	71	69	80	59
Orkney	0	65	57	75	73	74	67	64	68	61	73	59
Tayside	60	62	72	78	79	79	74	72	72	69	71	59
Forth Valley	64	63	68	79	79	79	71	72	71	67	69	60
Highland	59	61	61	72	77	74	68	71	69	66	70	60
Lanarkshire	64	61	65	76	78	77	71	73	71	70	67	60
Western Isles	72	65	65	75	79	74	67	74	64	70	70	60

Insulin Pump Use

The use of continuous subcutaneous insulin infusion (CSII or insulin pump therapy) as a method to manage Type 1 diabetes has increased in many developed countries during the last 20 years. The Scottish Diabetes Group, supported by the Government indicated the need to increase insulin pump use across all of Scotland, aiming to have 25 % of people with Type 1 diabetes under the age of 18 receiving this therapy and a significant increase in those over 18 also receiving insulin using this method. The results in table 33 and 34 describe the successful introduction of pumps across Scotland.

Table 33. Numbers and percentages of people with Type 1 diabetes using insulin pumps by age group and NHS Board, ranked by descending percentage of people aged under 18 using an insulin pump, December 2016.

NHS Board	Aged under 18			Aged 18 or over			All ages		
	Patient s (n)	On Pump		Patient s (n)	On Pump		Patient s (n)	On Pump	
		n	%		n	%		n	%
Orkney	9	7	77.8	105	11	10.5	114	18	15.8
Borders	63	29	46.0	628	68	10.8	691	97	14.0
Tayside	197	77	39.1	1,889	185	9.8	2,086	262	12.6
Lothian	401	156	38.9	4,308	443	10.3	4,709	599	12.7
Ayrshire and Arran	256	96	37.5	2,015	129	6.4	2,271	225	9.9
Highland	217	79	36.4	1,777	130	7.3	1,994	209	10.5
Dumfries and Galloway	94	33	35.1	856	119	13.9	950	152	16.0
Forth Valley	189	65	34.4	1,627	139	8.5	1,816	204	11.2
Shetland	12	4	33.3	119	5	4.2	131	9	6.9
Fife	193	64	33.2	1,911	211	11.0	2,104	275	13.1
Greater Glasgow and Clyde	564	185	32.8	5,720	406	7.1	6,284	591	9.4
Western Isles	20	6	30.0	174	10	5.7	194	16	8.2
Lanarkshire	458	137	29.9	3,666	269	7.3	4,124	406	9.8
Grampian	340	97	28.5	3,064	181	5.9	3,404	278	8.2
Scotland	3,013	1,035	34.4	27,859	2,306	8.3	30,872	3,341	10.8

Table 34. Numbers and percentages of people with Type 1 diabetes using insulin pumps by age group

Year	Aged under 18			Aged 18 or over			All ages		
	Patients (n)	On Pump		Patients (n)	On Pump		Patients (n)	On Pump	
		n	%		n	%		n	%
2016	3013	1035	34.4	27859	2306	8.3	30872	3341	10.8
2015	2950	919	31.2	27379	1948	7.1	30329	2867	9.5
2014	2953	849	28.8	26748	1632	6.1	29701	2481	8.4
2013	2917	659	22.6	26394	1188	4.5	29311	1847	6.3

Cardiovascular Risk

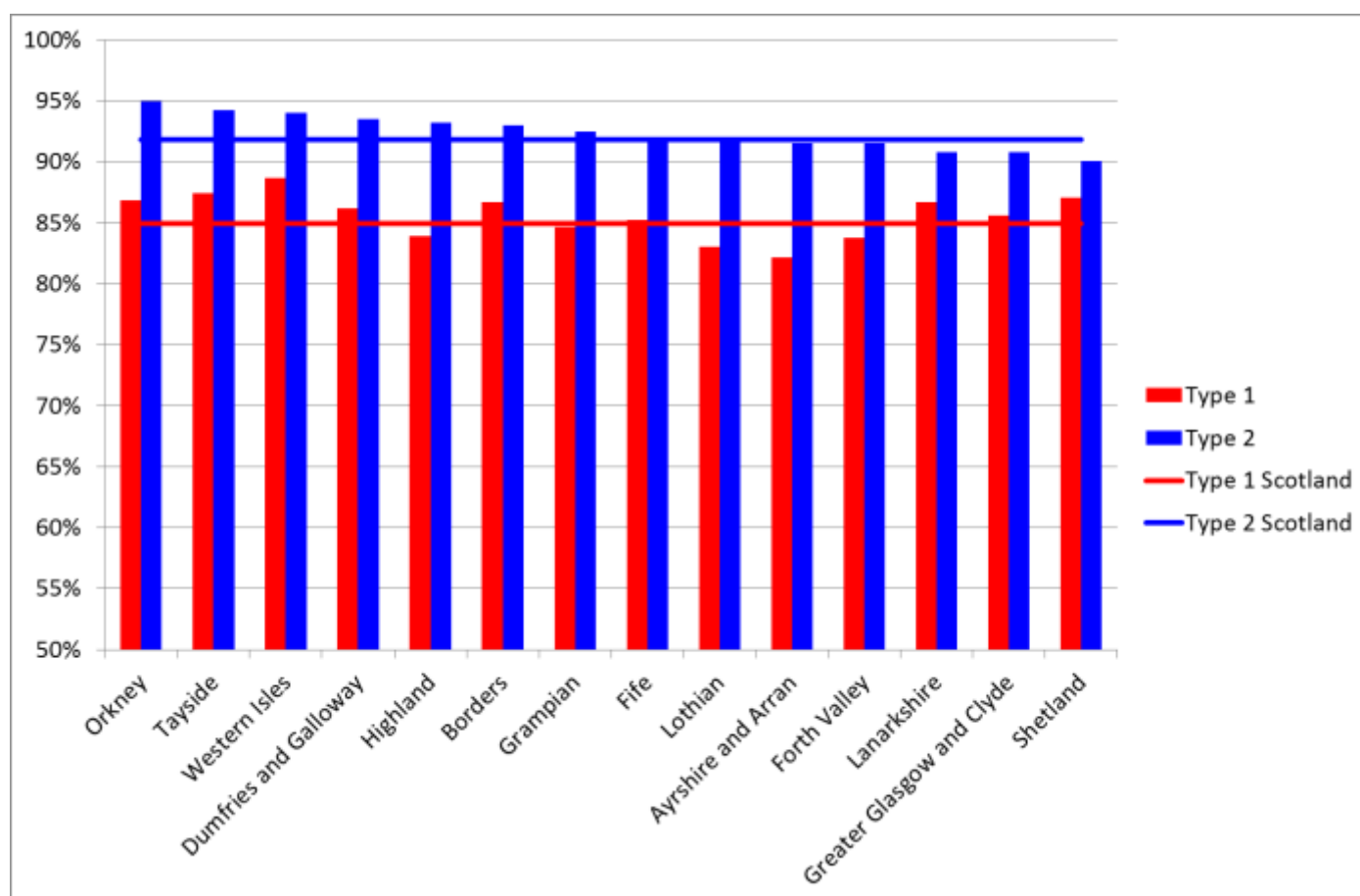
Diabetes is associated with an increased risk of cardiovascular disease and it is therefore important to address cardiovascular risk factors such as high blood pressure (BP), raised cholesterol and smoking.

Blood Pressure

91.1% of people with Type 1 or Type 2 diabetes had their BP recorded within the previous 15 months (Table 35), of which 76.6% had a systolic BP less than or equal to 140 mmHg (Tables 38 and 40), suggesting reasonable control of blood pressure. Figures by NHS Board and diabetes type are shown in Figures 16 and 18.

Note: Data from people of all ages are included in these blood pressure figures, in contrast to the processes of care, where there are restrictions.

Figure 15. Percentage of people with Type 1 or Type 2 diabetes (by diabetes type) with a recording of BP in the previous 15 months, by NHS Board; ranked by figures for Type 2.



Note: Y axis is interrupted at 50%; Horizontal lines show mean levels for Scotland as a whole.

Figures for blood pressure control by NHS Board are shown in Figures 16, 17 and 20 (Table 50 Scottish Diabetes Survey Monitoring Group

38 and Table 39) for Type 1 diabetes and in Figures 18, 19 and 21 (Table 40 and Table 41) for Type 2 diabetes.

Table 35. Percentage of people with Type 1 and Type 2 diabetes with a recording of BP in the previous 15 months, by NHS Board and diabetes type, ranked by figures for Type 2 diabetes.

NHS Board	Recorded within previous 15 months			
	Type 1 diabetes		Type 2 diabetes	
	Number	%	Number	%
Orkney	99	86.8	995	94.9
Tayside	1,824	87.4	19,751	94.2
Western Isles	172	88.7	1,147	94.0
Dumfries and Galloway	819	86.2	7,809	93.5
Highland	1,674	83.9	13,787	93.2
Borders	601	86.7	5,468	93.0
Grampian	2,880	84.6	22,950	92.4
Fife	1,793	85.2	17,593	92.0
Lothian	3,909	83.0	31,860	91.7
Ayrshire and Arran	1,866	82.2	19,328	91.5
Forth Valley	1,522	83.8	13,514	91.5
Lanarkshire	3,593	86.7	30,936	90.8
Greater Glasgow and Clyde	5,382	85.6	50,695	90.8
Shetland	114	87.0	888	90.1
Scotland	26,248	84.9	236,721	91.8

Note: The numbers in this table relate to all ages.

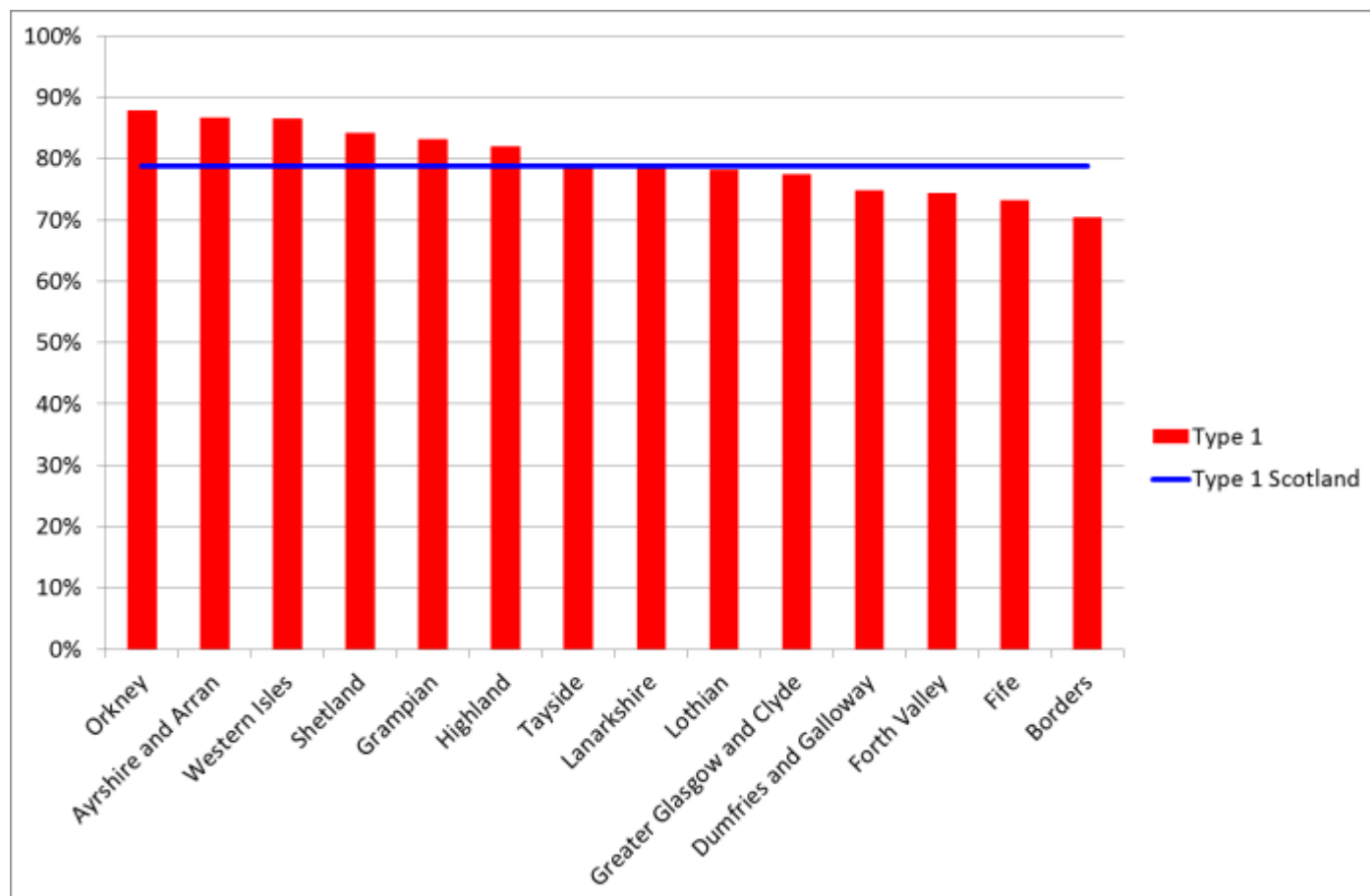
Table 36. Percentage of people with Type 1 diabetes with BP recorded within the previous 15 months.

Year	Type 1 population	BP Recorded (n)	BP Recorded (%)
2016	30,899	26,248	84.9
2015	30,356	26,298	86.6
2014	29,802	26,201	87.9
2013	29,261	25,395	86.8
2012	28,849	24,574	85.2
2011	28,272	24,165	85.5
2010	27,910	23,977	85.9
2009	27,367	23,568	86.1

Table 37. Percentage of people with Type 2 diabetes with a BP recorded within the previous 15 months.

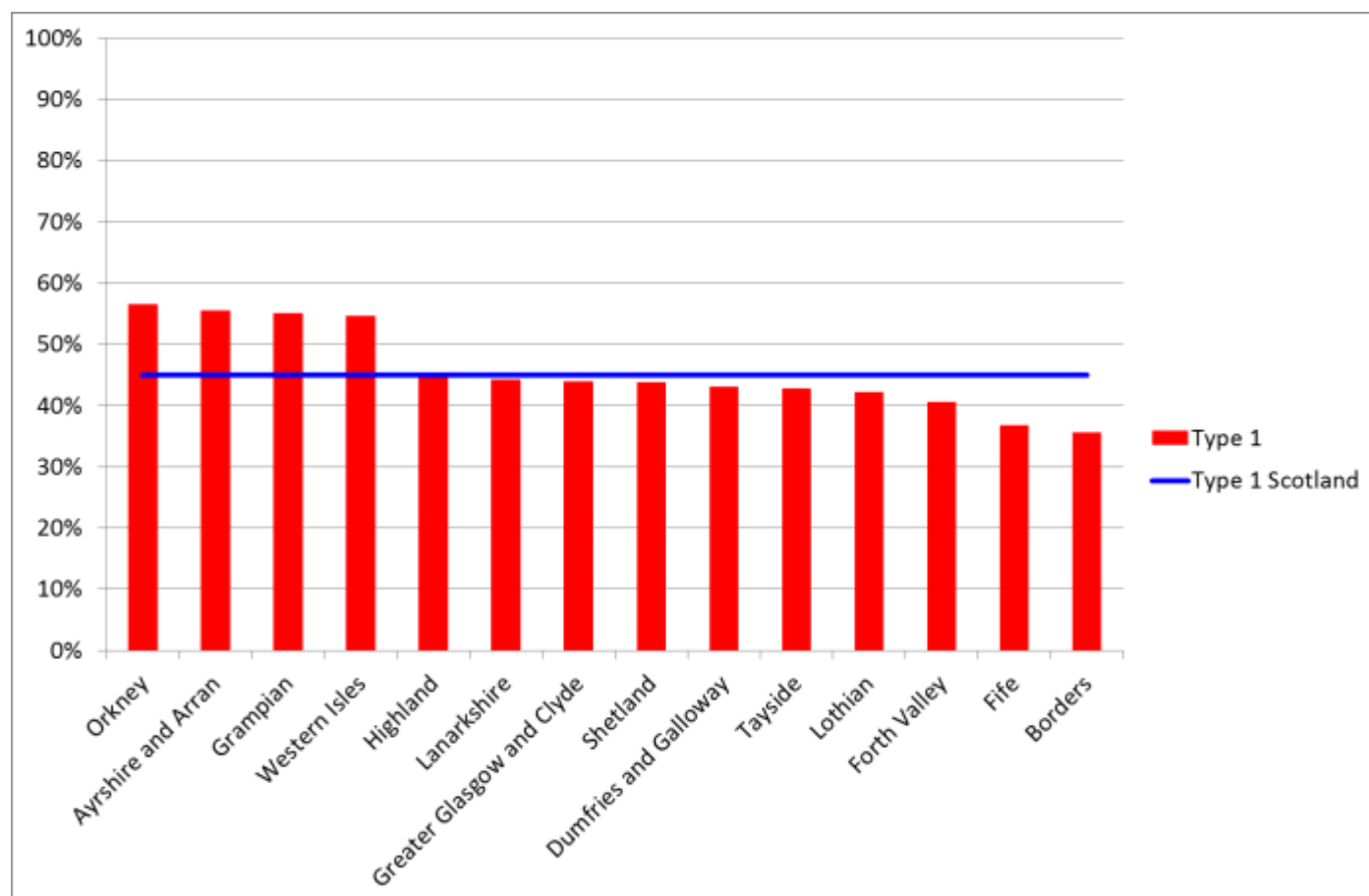
Year	Type 2 population	BP Recorded (n)	BP Recorded (%)
2016	257,728	236,721	91.8
2015	250,881	234,631	93.5
2014	244,050	230,710	94.5
2013	236,605	224,420	94.9
2012	227,967	215,702	94.6
2011	217,514	204,782	94.1
2010	208,279	196,638	94.4
2009	199,264	189,289	95.0

Figure 16. Type 1 diabetes: Percentage of people with most recent systolic blood pressure (SBP) \leq 140 mmHg in the last 15 months by NHS Board.



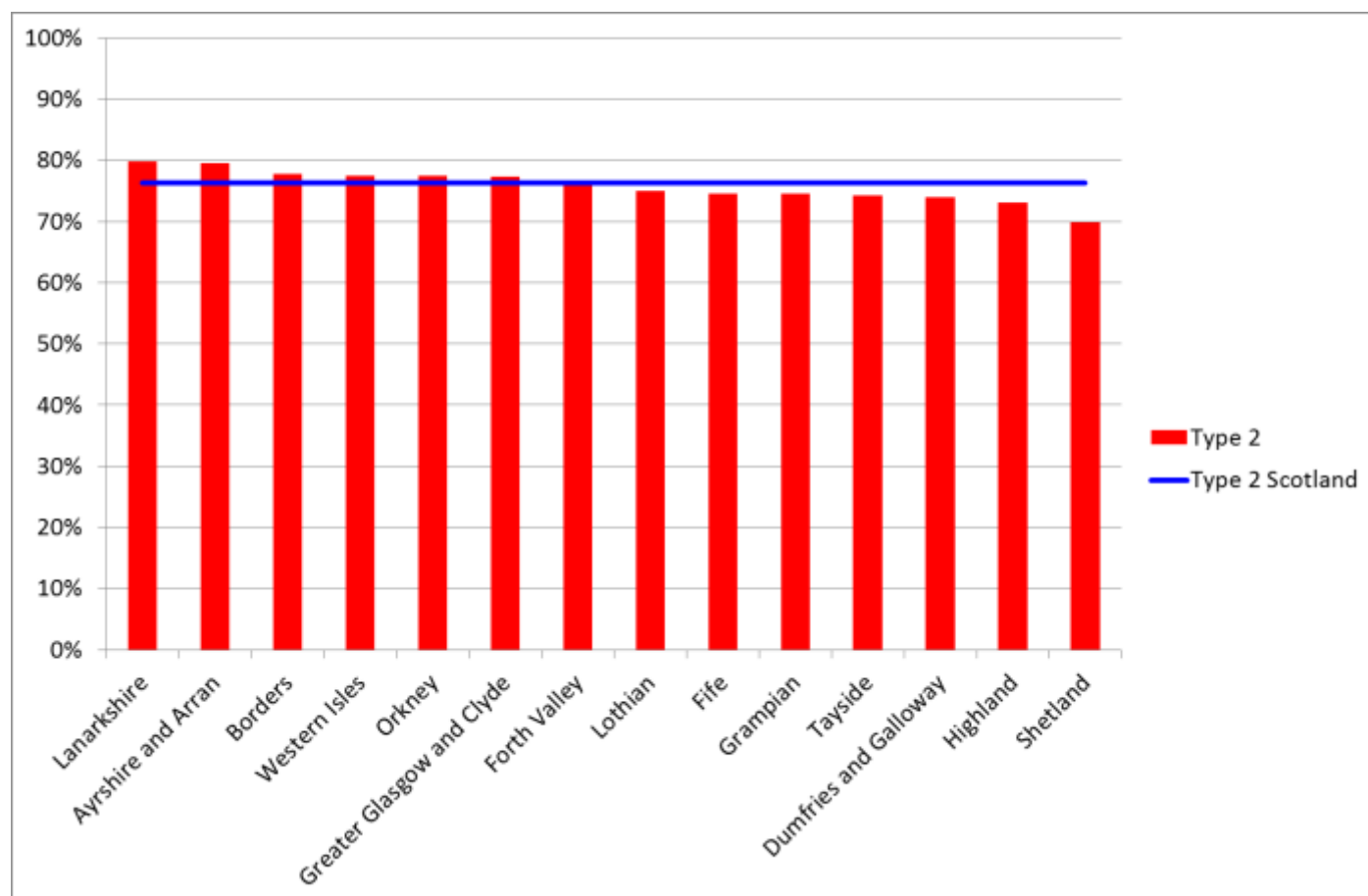
Note: Horizontal line indicates mean level for Scotland as a whole.

Figure 17. Type 1 diabetes: Percentage of people with most recent blood pressure in the last 15 months < 130 mmHg (systolic) and ≤ 80 mmHg (diastolic), by NHS Board.



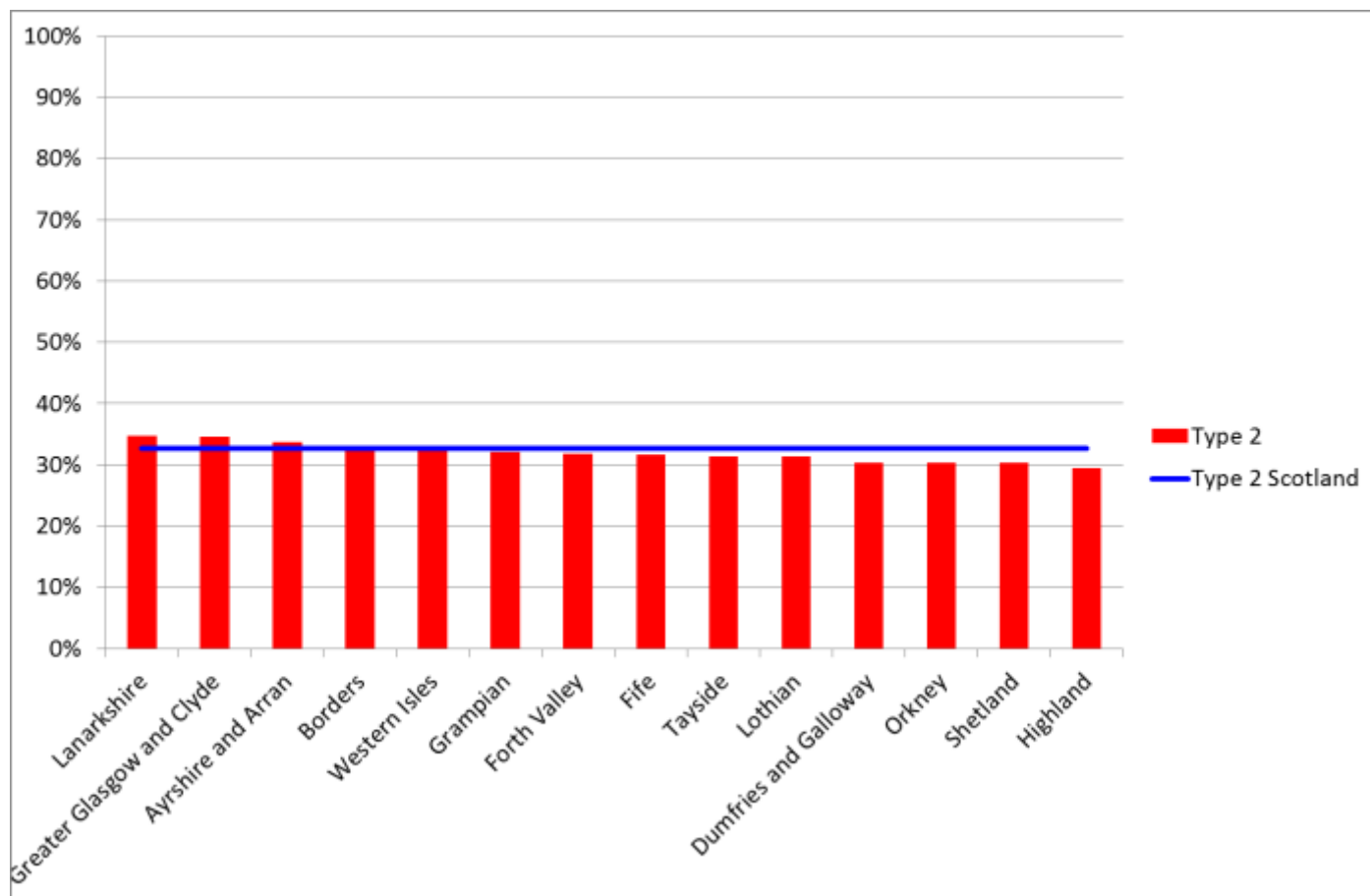
Note: Horizontal line indicates mean level for Sc Bill and Brian (figure 23) would like some comment around the drop in recording and the removal of QoF.otland as a whole.

Figure 18. Type 2 diabetes: Percentage of people with most recent systolic blood pressure (SBP) \leq 140 mmHg in the last 15 months by NHS Board.



Horizontal line indicates mean level for Scotland as a whole.

Figure 19. Type 2 diabetes: Percentage of people with most recent blood pressure in the last 15 months < 130 mmHg (systolic) and ≤ 80 mmHg (diastolic), by NHS Board.



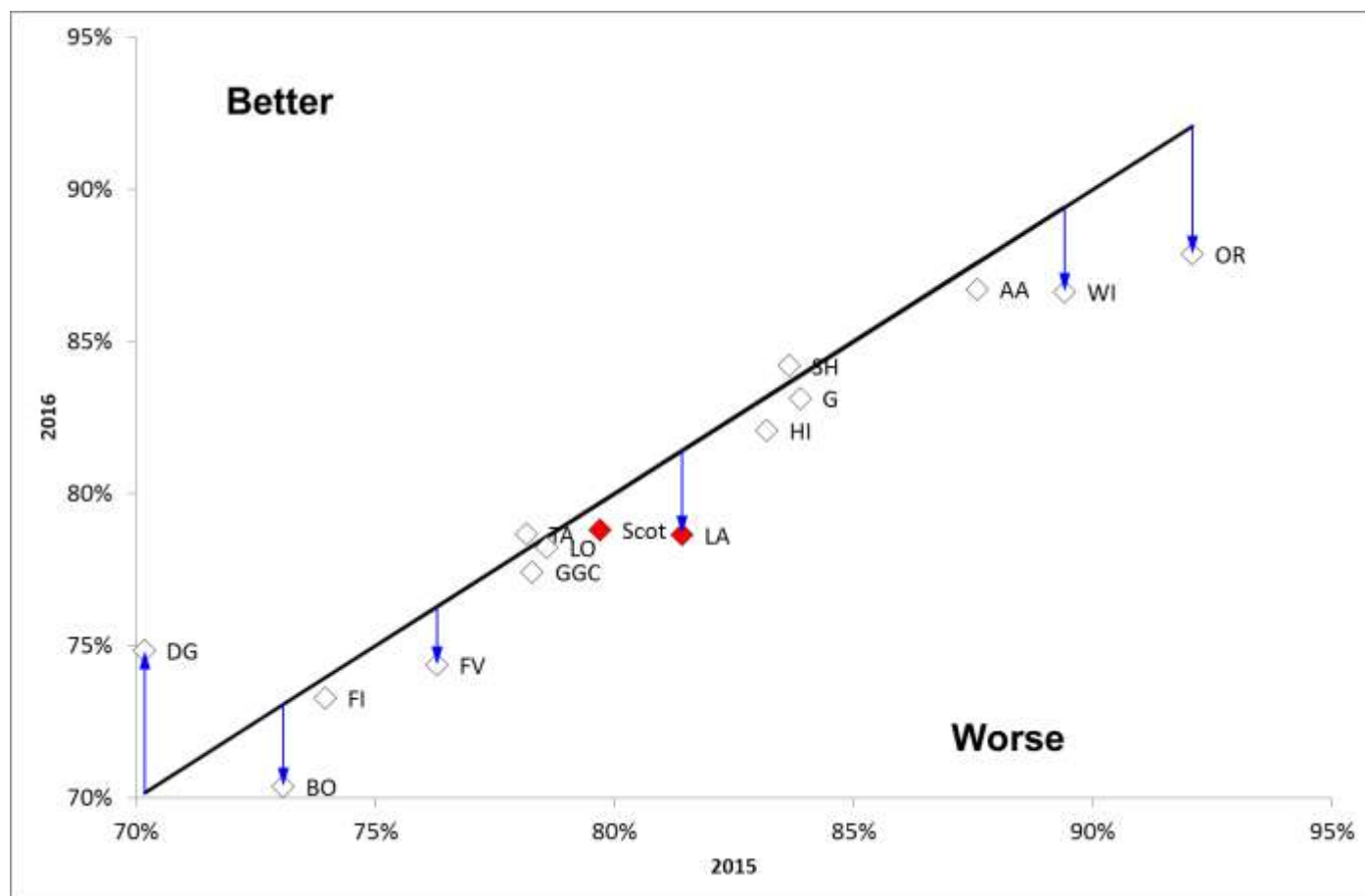
Note: Horizontal line indicates mean level for Scotland as a whole.

Table 38. Type 1 diabetes: Percentage of people with systolic blood pressure (SBP) ≤ 140 mmHg by NHS Board, ranked by percentage > 140 mmHg.

NHS Board	Systolic BP ≤ 140		Systolic BP > 140		Total recorded	Not recorded	
	n	%	n	%		n	%
Orkney	87	87.9	12	12.1	99	15	13.2
Ayrshire and Arran	1,618	86.7	248	13.3	1,866	405	17.8
Western Isles	149	86.6	23	13.4	172	22	11.3
Shetland	96	84.2	18	15.8	114	17	13.0
Grampian	2,394	83.1	486	16.9	2,880	524	15.4
Highland	1,374	82.1	300	17.9	1,674	321	16.1
Tayside	1,435	78.7	389	21.3	1,824	263	12.6
Lanarkshire	2,826	78.7	767	21.3	3,593	550	13.3
Lothian	3,058	78.2	851	21.8	3,909	800	17.0
Greater Glasgow and Clyde	4,167	77.4	1,215	22.6	5,382	905	14.4
Dumfries and Galloway	613	74.8	206	25.2	819	131	13.8
Forth Valley	1,132	74.4	390	25.6	1,522	295	16.2
Fife	1,314	73.3	479	26.7	1,793	311	14.8
Borders	423	70.4	178	29.6	601	92	13.3
Scotland	20,686	78.8	5,562	21.2	26,248	4,651	15.1

Note: Restricted to most recent value recorded in the previous 15 months – those with only older results are classed as missing (not recorded).

Figure 20. Type 1 diabetes: Percentage of people with SBP ≤ 140 mmHg from 2015 to 2016.



Note: Arrows showing the direction of change have been added for all boards with more than 2.5% change over that period. Points in red indicate statistically significant change. The diagonal line shows no change between 2015 and 2016.

Table 39. Type 1 diabetes: Percentage of people achieving a target of systolic blood pressure (SBP) <130 mmHg AND diastolic blood pressure (DBP) ≤80 mmHg, by NHS Board (denominator those with recording of SBP and DBP within the previous 15 months), ranked by percentage of those who failed to meet this target.

NHS Board	Met BP target		Did not meet BP target		Total recorded	Not recorded	
	n	%	n	%		n	%
Orkney	56	56.6	43	43.4	99	15	13.2
Ayrshire and Arran	1,037	55.6	829	44.4	1,866	405	17.8
Grampian	1,587	55.1	1,293	44.9	2,880	524	15.4
Western Isles	94	54.7	78	45.3	172	22	11.3
Highland	756	45.2	918	54.8	1,674	321	16.1
Lanarkshire	1,587	44.2	2,006	55.8	3,593	550	13.3
Greater Glasgow and Clyde	2,367	44.0	3,015	56.0	5,382	905	14.4
Shetland	50	43.9	64	56.1	114	17	13.0
Dumfries and Galloway	353	43.1	466	56.9	819	131	13.8
Tayside	780	42.8	1,044	57.2	1,824	263	12.6
Lothian	1,650	42.2	2,259	57.8	3,909	800	17.0
Forth Valley	618	40.6	904	59.4	1,522	295	16.2
Fife	659	36.8	1,134	63.2	1,793	311	14.8
Borders	214	35.6	387	64.4	601	92	13.3
Scotland	11,808	45.0	14,440	55.0	26,248	4,651	15.1

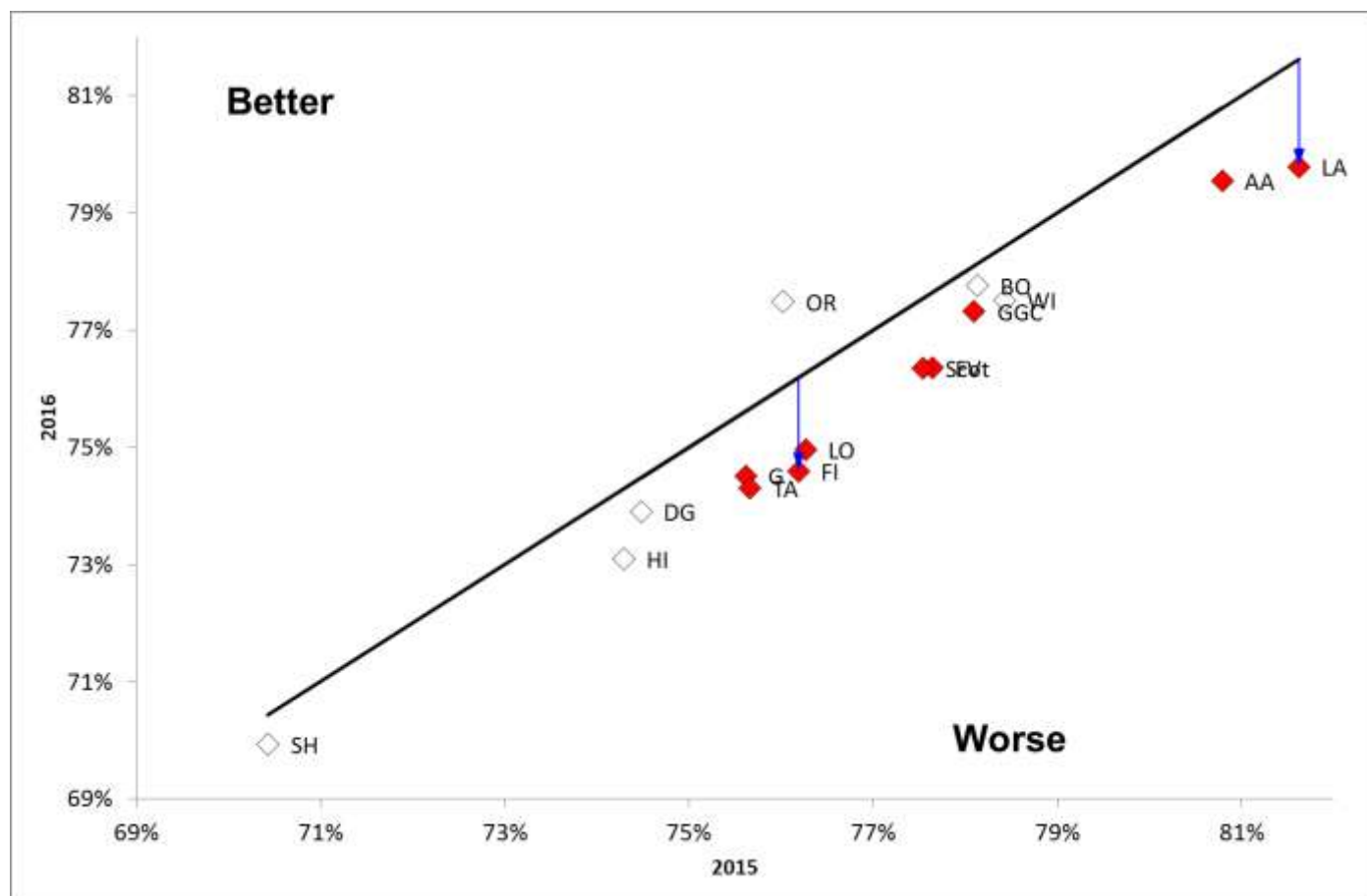
Note: Restricted to most recent value recorded in the previous 15 months – those with only older results are classed as missing (not recorded).

Table 40. Type 2 diabetes: Percentage of people with systolic blood pressure (SBP) \leq 140 mmHg by NHS Board, ranked by percentage $>$ 140 mmHg.

NHS Board	BP \leq 140		BP $>$ 140		Total recorded	Not recorded	
	n	%	n	%		n	%
Lanarkshire	24,682	79.8	6,254	20.2	30,936	3,133	9.2
Ayrshire and Arran	15,375	79.5	3,953	20.5	19,328	1,795	8.5
Borders	4,252	77.8	1,216	22.2	5,468	411	7.0
Western Isles	889	77.5	258	22.5	1,147	73	6.0
Orkney	771	77.5	224	22.5	995	53	5.1
Greater Glasgow and Clyde	39,198	77.3	11,497	22.7	50,695	5,143	9.2
Forth Valley	10,319	76.4	3,195	23.6	13,514	1,256	8.5
Lothian	23,882	75.0	7,978	25.0	31,860	2,888	8.3
Fife	13,123	74.6	4,470	25.4	17,593	1,526	8.0
Grampian	17,100	74.5	5,850	25.5	22,950	1,875	7.6
Tayside	14,676	74.3	5,075	25.7	19,751	1,212	5.8
Dumfries and Galloway	5,771	73.9	2,038	26.1	7,809	543	6.5
Highland	10,078	73.1	3,709	26.9	13,787	1,002	6.8
Shetland	621	69.9	267	30.1	888	98	9.9
Scotland	180,737	76.4	55,984	23.6	236,721	21,008	8.2

Note: Restricted to most recent value recorded in the previous 15 months – those with only older results are classed as missing (not recorded).

Figure 21. Type 2 diabetes: Percentage of people with SBP ≤ 140 mmHg from 2015 to 2016.



Note: Arrows showing the direction of change have been added for all boards with more than 2.5% change over that period. Points in red indicate statistically significant change. The diagonal line shows no change between 2015 and 2016.

Table 41. Type 2 diabetes: Percentage of people achieving a target of systolic blood pressure (SBP) <130 mmHg AND diastolic blood pressure (DBP) ≤80 mmHg, by NHS Board (denominator those with recording of SBP and DBP within the previous 15 months), ranked by percentage of those who failed to meet this target.

NHS Board	Met BP target		Did not meet BP target		Total recorded	Not recorded	
	n	%	n	%		n	%
Lanarkshire	10,742	34.7	20,194	65.3	30,936	3,133	9.2
Greater Glasgow and Clyde	17,499	34.5	33,196	65.5	50,695	5,143	9.2
Ayrshire and Arran	6,523	33.7	12,805	66.3	19,328	1,795	8.5
Borders	1,789	32.7	3,679	67.3	5,468	411	7.0
Western Isles	373	32.5	774	67.5	1,147	73	6.0
Grampian	7,368	32.1	15,582	67.9	22,950	1,875	7.6
Forth Valley	4,291	31.8	9,223	68.2	13,514	1,256	8.5
Fife	5,562	31.6	12,031	68.4	17,593	1,526	8.0
Tayside	6,202	31.4	13,549	68.6	19,751	1,212	5.8
Lothian	9,980	31.3	21,880	68.7	31,860	2,888	8.3
Dumfries and Galloway	2,373	30.4	5,436	69.6	7,809	543	6.5
Orkney	302	30.4	693	69.6	995	53	5.1
Shetland	269	30.3	619	69.7	888	98	9.9
Highland	4,066	29.5	9,721	70.5	13,787	1,002	6.8
Scotland	77,339	32.7	159,382	67.3	236,721	21,007	8.2

Note. Restricted to most recent value recorded in the previous 15 months – those with only older results are classed as missing (not recorded).

Table 42. Percentage of people with diabetes (Type 1 and Type 2 combined) with systolic blood pressure (SBP) \leq 140 mmHg.

Year	Total	Systolic BP \leq 140 (%)	Systolic BP $>$ 140 (%)	Not recorded (%)
2016	288,627	76.6	23.4%	8.9%
2015	281,237	77.8	22.2%	7.2%
2014	273,852	78.5	21.5%	6.2%
2013	256,866	78.6	21.4%	6.0%
2012	256,816	77.5	22.5%	6.4%
2011	228,948	76.0	24.0%	6.9%
2010	220,615	74.9	25.1%	6.6%
2009	212,857	75.1	24.9%	6.1%
2008	199,650	73.3	26.7%	9.2%
2007	204,166	73.0	27.0%	2.6%

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

Table 43. Type 1 diabetes: Mean BP (mmHg) recorded in previous 15 months in people aged $<$ 40 years, by NHS Board, ranked by mean systolic BP.

NHS Board	Mean systolic BP (mmHg)	Mean diastolic BP (mmHg)
Orkney	116	70
Ayrshire and Arran	118	71
Grampian	120	71
Western Isles	120	75
Dumfries and Galloway	122	76
Highland	122	74
Lothian	123	77
Greater Glasgow and Clyde	124	74
Lanarkshire	124	74
Shetland	124	74
Tayside	124	75
Forth Valley	126	76
Borders	127	73
Fife	127	76

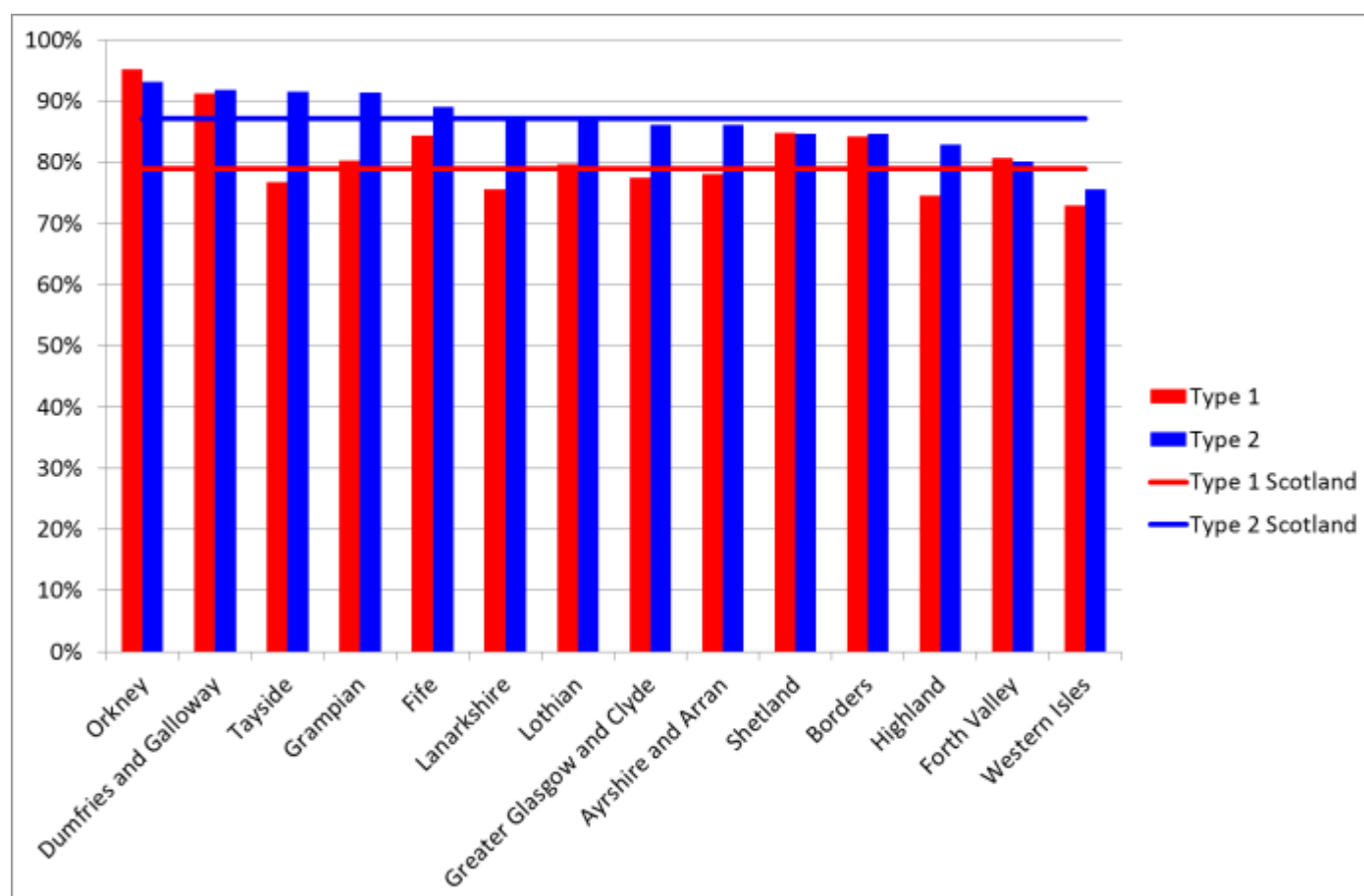
Table 44. Type 2 diabetes: Mean BP recorded in previous 15 months in people aged 50-59 years, by NHS Board, ranked by mean systolic BP.

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

Total Cholesterol

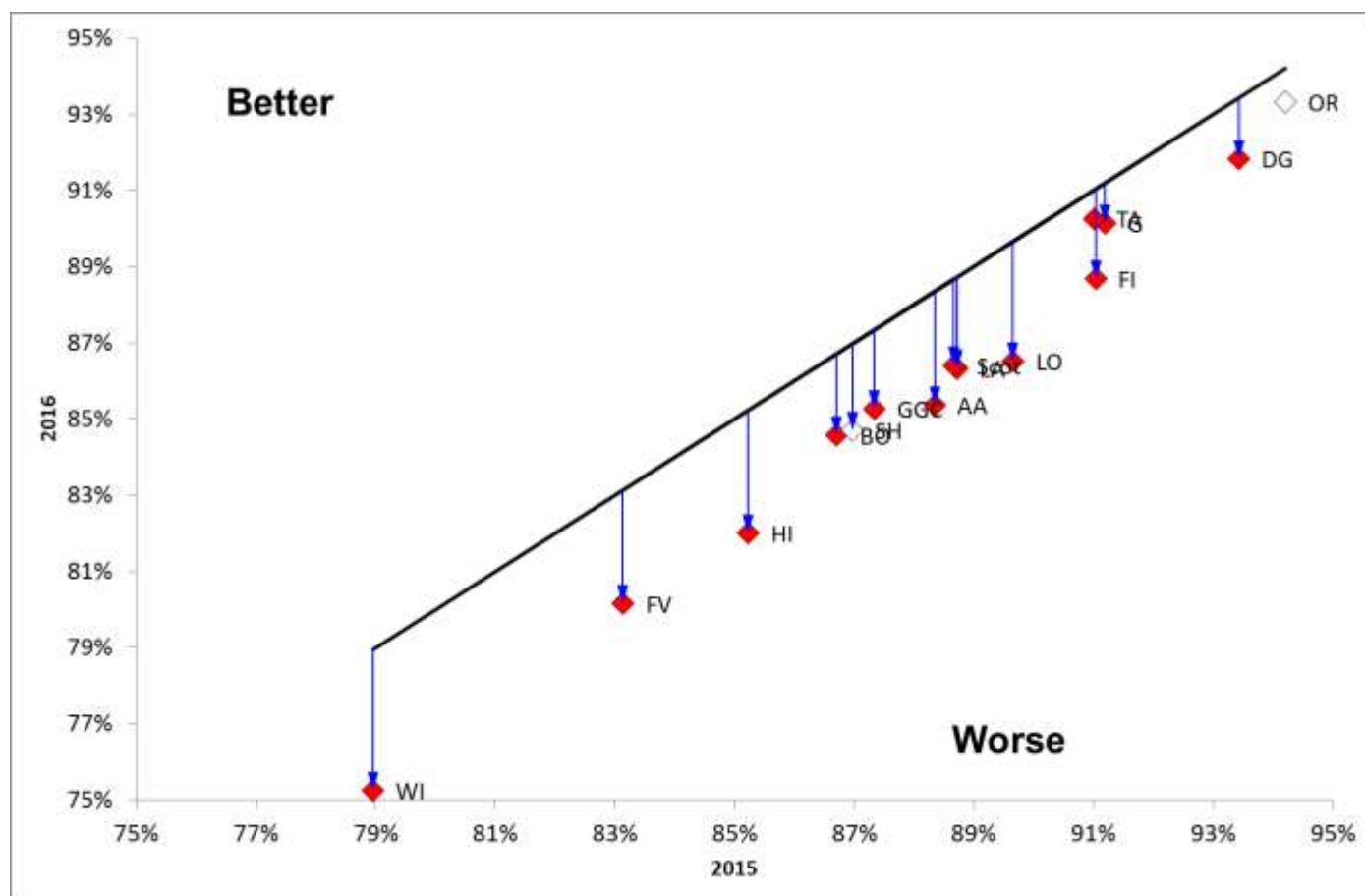
Cholesterol level was recorded in 86.4% of people with Type 1 or Type 2 diabetes within the previous 15 months (Table 45). Total cholesterol was less than or equal to 5.0mmol/l in 77.6% of patients with a recorded result (Tables 46 and 47).

Figure 22. Percentage of people with Type 1 or Type 2 diabetes with a record of cholesterol within the previous 15 months by diabetes type and NHS Board, ranked by the percentage of people with Type 2 diabetes with a record of cholesterol.



Note: Horizontal lines indicate figures for Scotland as a whole. Excludes children under 18 years or who have no recorded date of birth (Type1 n = 3040, Type 2 n = 130).

Figure 23. Percentage of people with diabetes (Type 1 and Type 2 combined) with a record of cholesterol within the previous 15 months from 2015 to 2016.



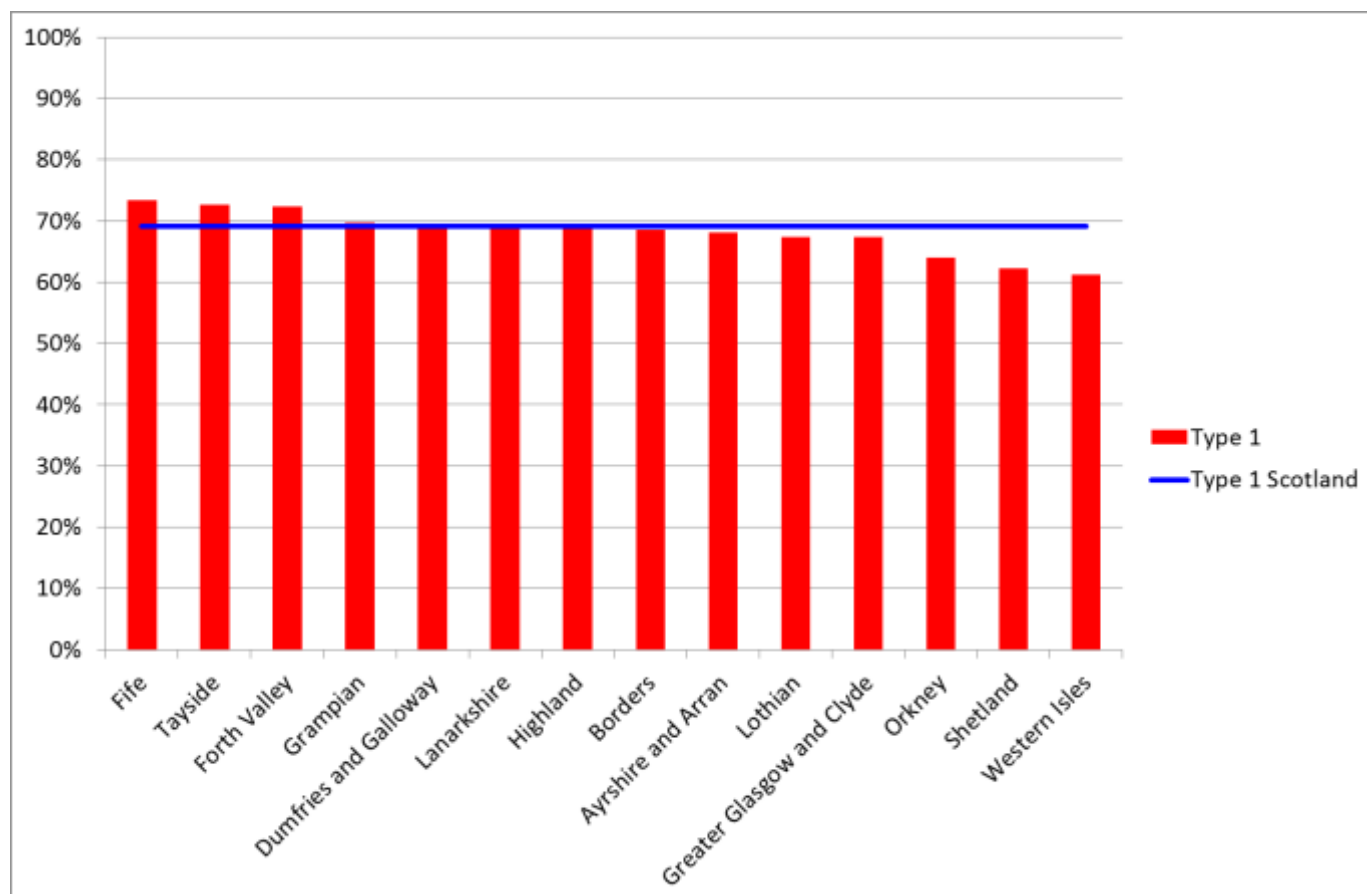
Note: Arrows showing the direction of change have been added for boards with more than 1% change over the period. Points in red indicate statistically significant change. The diagonal line shows no change between 2015 and 2016.

Table 45. Percentage of people with diabetes (Type 1 and Type 2 combined) with a record of cholesterol within the previous 15 months.

Year	Recorded within previous 15 months (%)
2016	86.4
2015	88.7
2014	90.7
2013	91.0
2012	90.6
2011	89.2
2010	89.6
2009	86.5
2008	90.1
2007	88.4

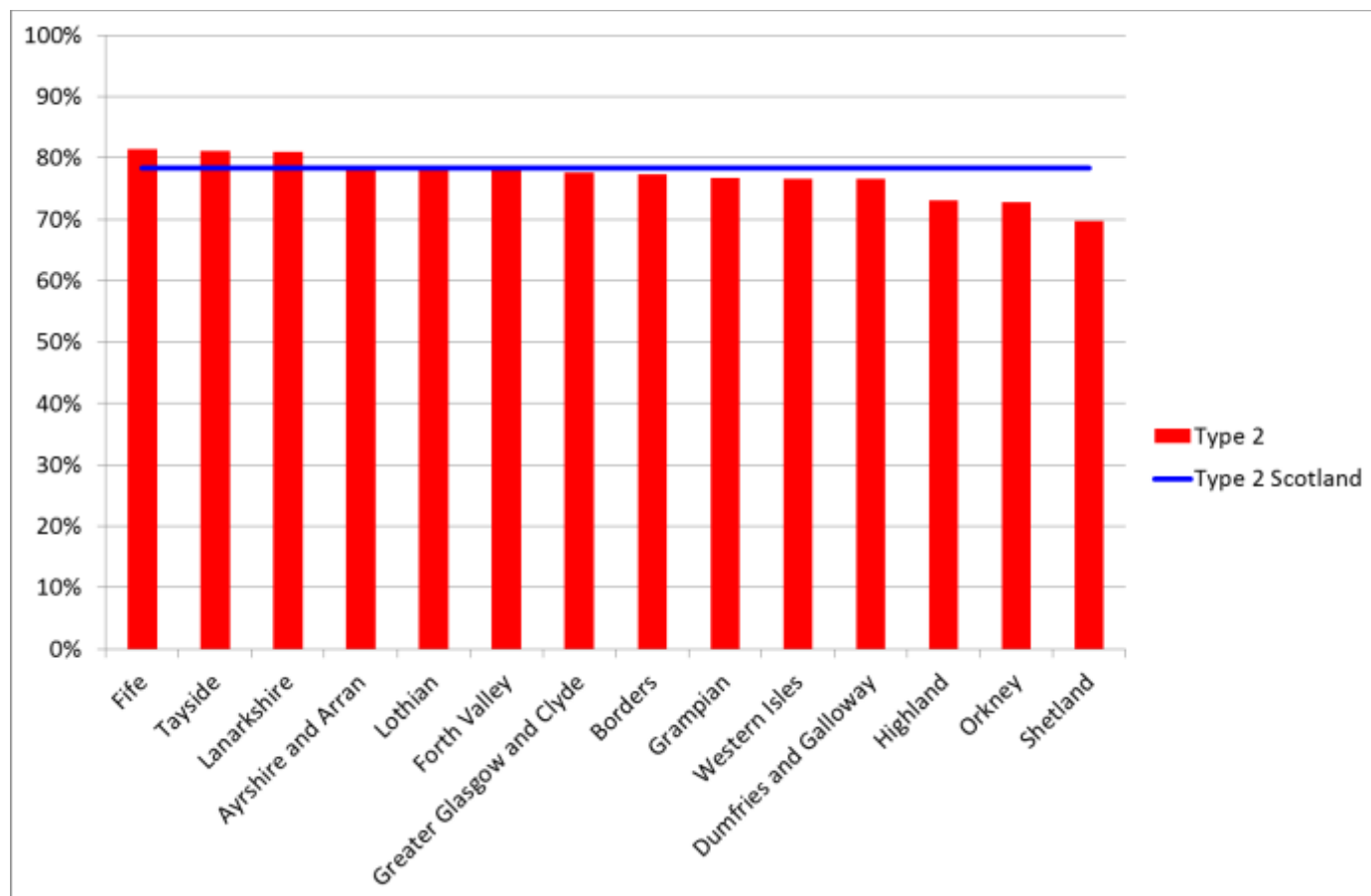
Note: Excludes children under 18 years or who have no recorded date of birth (type1 n = 3040, Type 2 n = 130).

Figure 24. Type 1 diabetes: Percentage of people with cholesterol $\leq 5\text{mmol/l}$, by NHS Board (denominator those with recording of cholesterol within the previous 15 months).



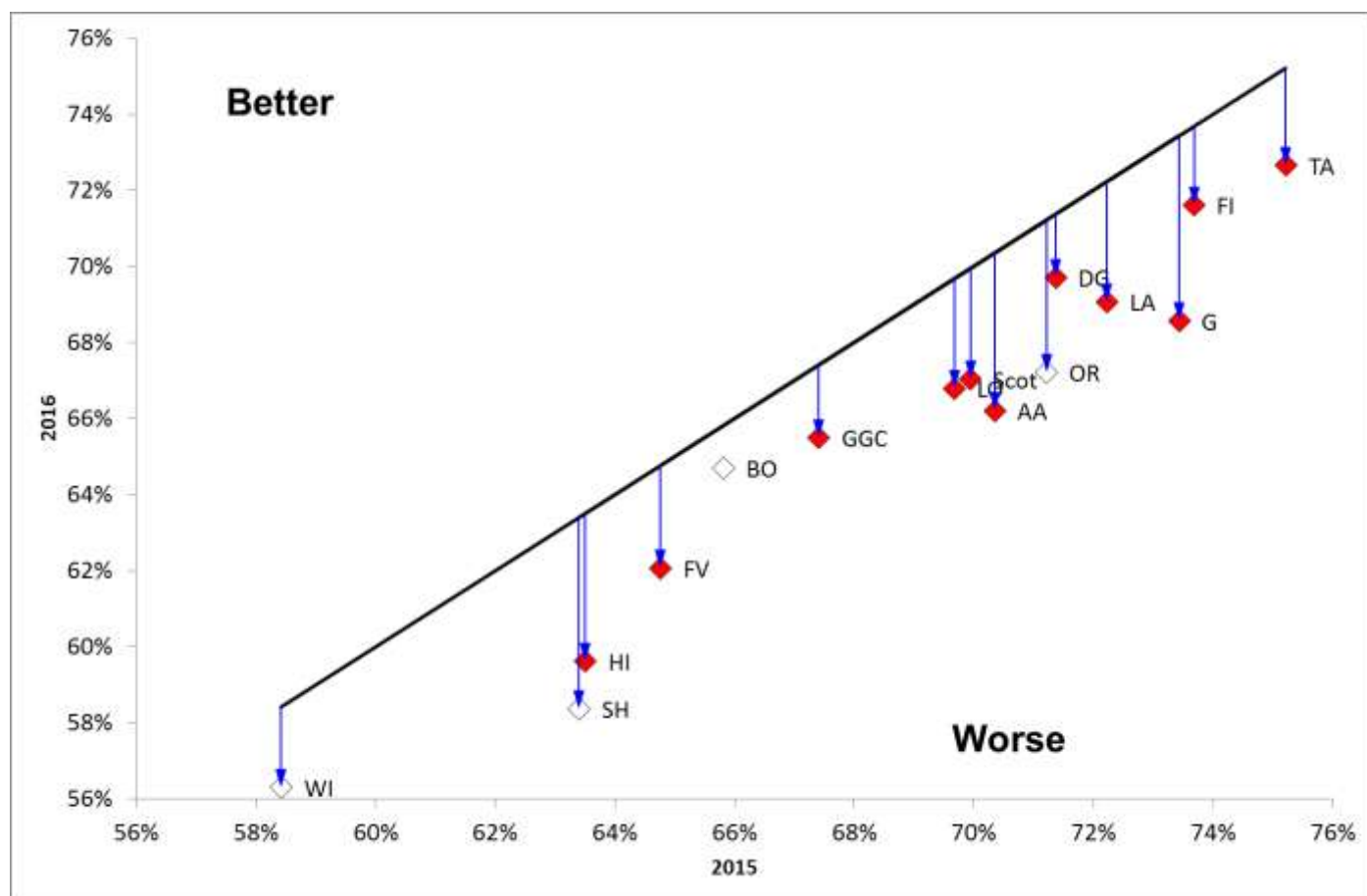
Note: Excludes children under 18 years (n=3013); Horizontal line indicates mean level for Scotland as a whole.

Figure 25. Type 2 diabetes: Percentage of people with cholesterol $\leq 5\text{mmol/l}$, by NHS Board (denominator those with recording of cholesterol within the previous 15 months).



Note: Excludes children under 18 years or who have no recorded date of birth (n= 130); Horizontal line indicates mean level for Scotland as a whole

Figure 26. Percentage of people with diabetes (Type 1 and Type 2 combined) with cholesterol ≤ 5 mmol/l within the previous 15 months from 2015 to 2016



Note: Arrows showing the direction of change have been added for all boards with more than 1.5% change over that period. Points in red indicate statistically significant change. The diagonal line shows no change between 2015 and 2016.

Table 46. Type 1 diabetes: Percentage of people with cholesterol ≤ 5 mmol/l, by NHS Board (denominator those with recording of cholesterol within the previous 15 months), ranked by percentage of people with cholesterol ≤ 5 mmol/l.

NHS Board	Total recorded	Total cholesterol ≤ 5 (%)	Not recorded (%)
Fife	1,612	73.3	15.6
Tayside	1,449	72.6	23.3
Forth Valley	1,312	72.4	19.4
Grampian	2,458	69.7	19.8
Dumfries and Galloway	781	69.4	8.8
Lanarkshire	2,772	69.3	24.4
Highland	1,326	69.1	25.4
Borders	529	68.6	15.8
Ayrshire and Arran	1,573	68.1	21.9
Lothian	3,435	67.4	20.3
Greater Glasgow and Clyde	4,429	67.3	22.6
Orkney	100	64.0	4.8
Shetland	101	62.3	15.1
Western Isles	127	61.3	27.0
Scotland	22,004	69.1	21.0

Note: Excludes patients under 18 years of age and patients whose date of birth has not been recorded (n = 3040).

Table 47. Type 2 diabetes: Percentage of people with cholesterol ≤ 5 mmol/l, by NHS Board (denominator those with recording of cholesterol within the previous 15 months), ranked by percentage of people with cholesterol ≤ 5 mmol/l.

NHS Board	Total recorded	Total cholesterol ≤ 5 (%)	Not recorded (%)
Fife	17,030	81.4	10.9
Tayside	19,173	81.1	8.5
Lanarkshire	29,741	81.0	12.5
Ayrshire and Arran	18,178	78.4	13.9
Lothian	30,343	78.3	12.6
Forth Valley	11,827	78.0	19.9
Greater Glasgow and Clyde	48,046	77.7	13.9
Borders	4,972	77.3	15.4
Grampian	22,679	76.8	8.6
Western Isles	922	76.7	24.4
Dumfries and Galloway	7,669	76.6	8.1
Highland	12,257	73.1	17.1
Orkney	976	72.8	6.9
Shetland	835	69.7	15.3
Scotland	224,648	78.4	12.8

Note: Excludes patients under 18 years of age and patients whose date of birth has not been recorded (n = 130).

Table 48. Percentage of people with diabetes (Type 1 and Type 2 combined) with cholesterol \leq 5mmol/l, by year (denominator those with recording of cholesterol within the previous 15 months).

Year	Cholesterol \leq 5		Cholesterol $>$ 5		Not recorded		Total
	Number	%	Number	%	Number	%	
2016	191,365	77.6	55,287	22.4	38,805	13.6	285,457
2015	194,520	78.9	52,093	21.1	31,512	11.3	278,125
2014	196,091	79.8	49,502	20.2	25,132	9.3	270,725
2013	191,130	79.9	47,970	20.1	23,654	9.0	262,754
2012	182,643	79.5	47,145	20.5	23,895	9.4	253,683
2011	174,832	79.8	44,364	20.2	25,604	10.4	245,786
2010	169,367	80.4	41,391	19.6	24,440	10.4	235,198
2009	157,434	80.7	37,650	19.3	30,551	13.5	225,635
2008	157,938	80.1	39,107	19.9	21,858	10.0	218,903
2007	159,843	79.8	40,552	20.2	8,257	4.0	208,652

Note: From 2008 onwards, there was a requirement that cholesterol should be in previous 15 months. In 2007, older results could be included if there was no recent result. Excludes patients under 18 years of age and patients whose date of birth has not been recorded (n = 3170).

Table 49. Type 2 diabetes: Mean total cholesterol recorded in previous 15 months in people aged 50-59 years, by NHS Board, ranked by mean cholesterol.

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

Smoking Status

Smoking status was recorded for 78.2% of the diabetic population (Table 52). Tables 50 and 51 show those with a recorded smoking status in the last 15 months. Overall, 17.7% reported that they currently smoke (22.9% Type 1 and 17.2% Type 2). Figure 27 and Figure 28 graphically show the percentages of the smoking status, including those without a recording, using the diabetic population as the denominator.

Note: Data from people of all ages are included in these smoking figures.

Figure 27. Type 1 diabetes: Smoking status as a percentage of all those with Type 1 diabetes, by NHS Health Board.

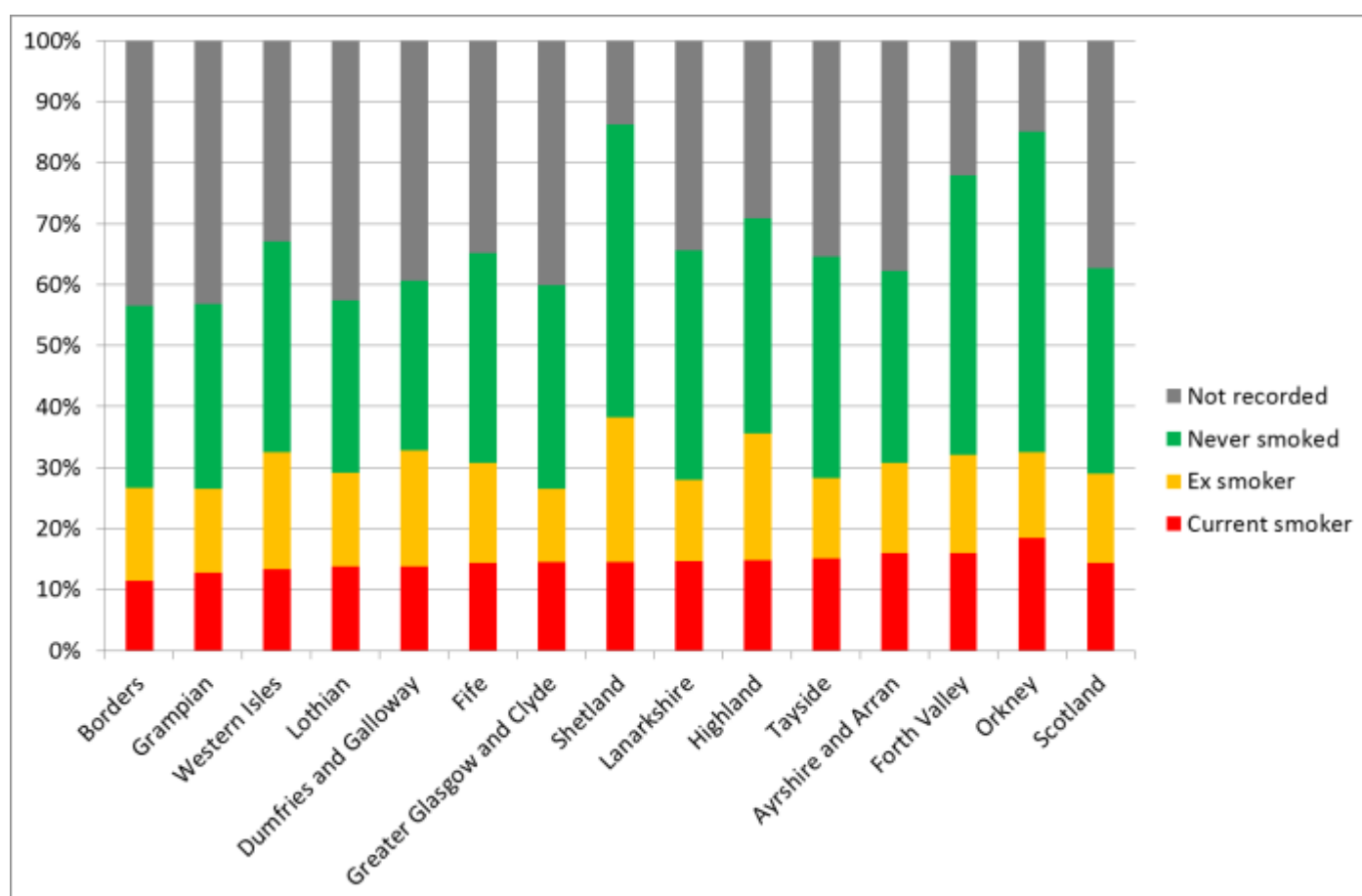


Figure 28. Type 2 diabetes: Smoking status as a percentage of all those with Type 2 diabetes, by NHS Health Board.

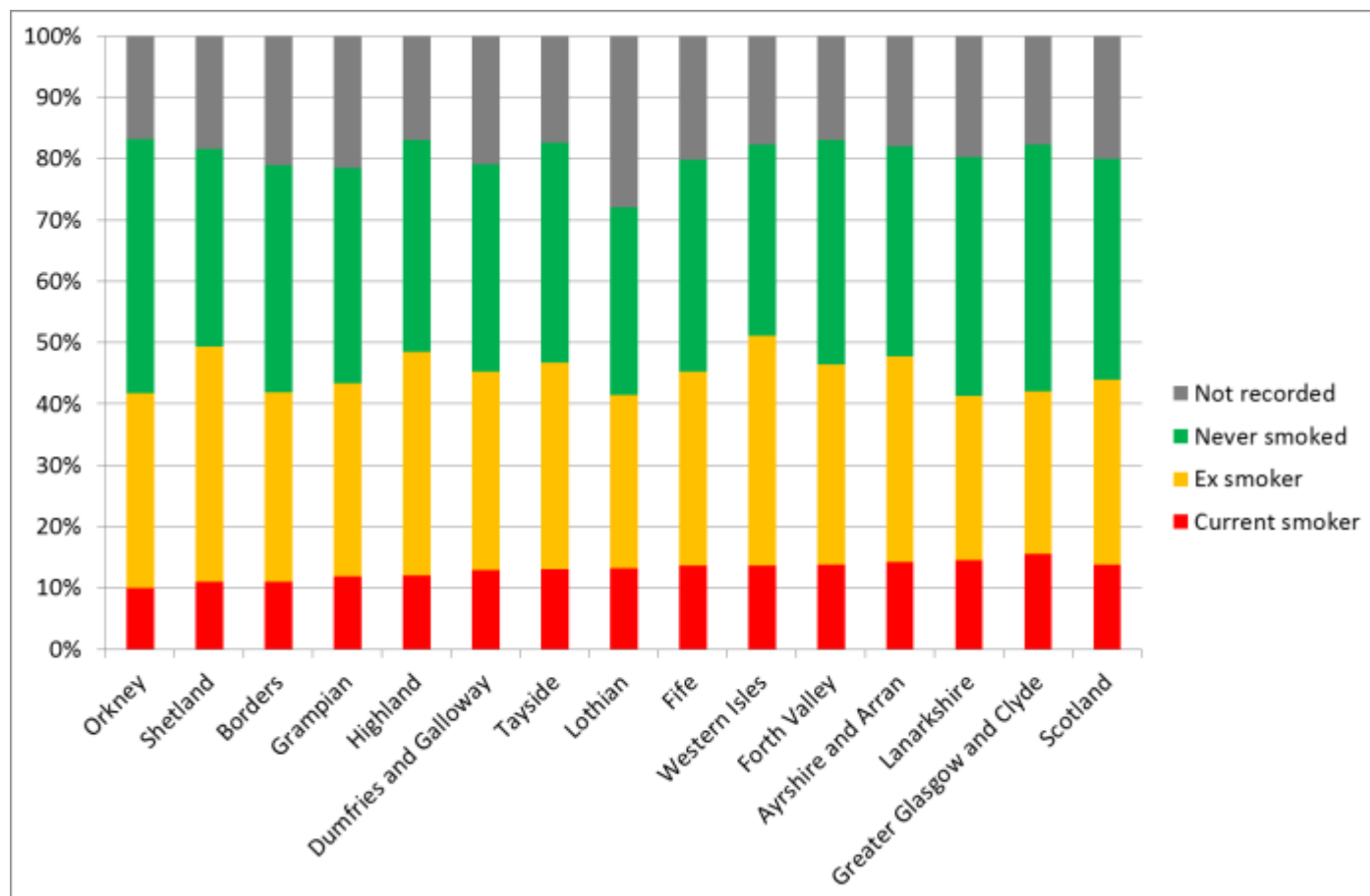


Table 50. Type 1 diabetes: Percentage of people who were recorded as current, ex- or never-smokers, by NHS Board (denominator those with recording of smoking status); ranked by percentage who are current smokers.

NHS Board	No. with known status	Current smoker (%)	Ex-smoker (%)	Never smoked (%)	Recorded (%)
Shetland	113	16.8	27.4	55.8	86.3
Western Isles	130	20.0	28.5	51.5	67.0
Borders	392	20.2	27.0	52.8	56.6
Forth Valley	1,415	20.5	20.8	58.7	77.9
Highland	1,415	20.9	29.2	49.9	70.9
Orkney	97	21.6	16.5	61.9	85.1
Fife	1,370	22.0	25.1	52.8	65.1
Lanarkshire	2,720	22.4	20.1	57.4	65.7
Grampian	1,932	22.6	24.2	53.2	56.8
Dumfries and Galloway	576	22.7	31.4	45.8	60.6
Tayside	1,348	23.4	20.3	56.2	64.6
Lothian	2,701	24.0	27.0	49.1	57.4
Greater Glasgow and Clyde	3,767	24.1	20.1	55.8	59.9
Ayrshire and Arran	1,413	25.5	23.9	50.5	62.2
Scotland	19,389	22.9	23.4	53.7	62.7

Table 51. Type 2 diabetes: Percentage of people who were recorded as current, ex- or never-smokers, by NHS Board (denominator those with recording of smoking status); ranked by percentage who are current smokers.

NHS Board	No. with known status	Current smoker (%)	Ex smoker (%)	Never smoked (%)	Recorded (%)
Orkney	872	11.9	38.2	49.9	83.2
Shetland	804	13.4	47.0	39.6	81.5
Borders	4,639	14.0	39.1	46.9	78.9
Highland	12,281	14.6	43.8	41.7	83.0
Grampian	19,497	15.1	40.1	44.8	78.5
Tayside	17,304	15.8	40.8	43.4	82.5
Dumfries and Galloway	6,611	16.3	40.8	42.9	79.2
Forth Valley	12,262	16.6	39.4	44.0	83.0
Western Isles	1,005	16.6	45.4	38.0	82.4
Fife	15,263	17.1	39.6	43.3	79.8
Ayrshire and Arran	17,313	17.3	40.9	41.7	82.0
Lanarkshire	27,366	18.0	33.4	48.6	80.3
Lothian	25,053	18.2	39.3	42.4	72.1
Greater Glasgow and Clyde	45,930	19.0	32.2	48.8	82.3
Scotland	206,200	17.2	37.7	45.2	80.0

Table 52. Percentage of people with diabetes (Type 1 and Type 2 combined) who were recorded as current, ex- or never-smokers (denominator those with record of smoking status).

Year	Current smoker (%)	Ex-smoker (%)	Never smoked (%)	Not recorded (%)
2016	17.7	36.4	45.9	21.8
2015	18.1	36.6	45.4	18.8
2014	18.8	36.3	45.0	15.4
2013 (a)	18.7	34.9	46.5	1.5
2012	19.3	35.2	45.5	4.7
2011 (b)	19.3	34.4	46.4	0.8
2010	19.3	35.1	45.7	1.0
2009	19.5	35.5	45.0	1.1
2008	19.6	35.6	44.8	1.8
2007	20.0	35.2	44.9	3.3

Note: (a) Data for years prior to 2014 are calculated based on whether smoking status has ever been recorded, whereas data from 2014 onwards is calculated based on whether smoking status was recorded in the last 15 months. (b) Data for years prior to 2012 are calculated as a percentage of all registered patients with recorded smoking status.

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 people of working age;

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

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

Myocardial Infarction

26,044 (9.0%) of registered patients have a record of a previous MI (Table 53). Others will have had an MI but not survived. There have been improvements in recording, increased use of procedures and better survival following an MI in recent years.

Table 53. Percentage of people with Type 1 or Type 2 diabetes recorded as having had a previous myocardial infarction (MI), by diabetes type and NHS board, ranked from low to high by percentage among people with Type 2 diabetes.

NHS Board	Recorded as having had an MI			
	Type 1		Type 2	
	Number	%	Number	%
Shetland	5	3.8	72	7.3
Orkney	5	4.4	88	8.4
Western Isles	5	2.6	107	8.8
Dumfries and Galloway	42	4.4	734	8.8
Grampian	112	3.3	2,231	9.0
Borders	34	4.9	540	9.2
Fife	75	3.6	1,778	9.3
Lothian	141	3.0	3,278	9.4
Forth Valley	53	2.9	1,411	9.6
Tayside	64	3.1	2,042	9.7
Ayrshire and Arran	91	4.0	2,094	9.9
Lanarkshire	155	3.7	3,426	10.1
Highland	69	3.5	1,501	10.1
Greater Glasgow and Clyde	216	3.4	5,675	10.2
Scotland	1,067	3.5	24,977	9.7

Table 54. Percentage of people with diabetes (Type 1 and Type 2 combined) who are recorded as having had a previous myocardial infarction (MI).

Year	Myocardial infarction (%)
2016	9.0
2015	9.1
2014	9.2
2013	9.3
2012	9.4
2011	9.5
2010	9.1
2009	9.5
2008	9.5
2007	9.5

Note: This table shows the percentage of people with diabetes who have ever had a record of a heart attack and survived.

Cardiac Revascularisation

20,032 (6.9%) people included in the survey have a record of having undergone cardiac revascularisation (Table 55), including coronary artery bypass graft (CABG) and percutaneous transluminal coronary angioplasty (PTCA).

Table 55. Percentage of people with Type 1 or Type 2 diabetes who have a record of cardiac revascularisation by NHS Board and diabetes type, ranked from low to high by percentage among people with Type 2 diabetes.

NHS Board	Recorded as having undergone cardiac revascularisation			
	Type 1		Type 2	
	Number	%	Number	%
Shetland	4	3.1	56	5.7
Fife	45	2.1	1,177	6.2
Dumfries and Galloway	34	3.6	560	6.7
Forth Valley	37	2.0	992	6.7
Western Isles	5	2.6	84	6.9
Orkney	4	3.5	73	7.0
Ayrshire and Arran	54	2.4	1,528	7.2
Tayside	53	2.5	1,518	7.2
Borders	21	3.0	432	7.3
Lanarkshire	132	3.2	2,563	7.5
Lothian	119	2.5	2,685	7.7
Greater Glasgow and Clyde	152	2.4	4,357	7.8
Highland	56	2.8	1,179	8.0
Grampian	100	2.9	2,012	8.1
Scotland	816	2.6	19,216	7.5

Table 56. Percentage of people with Type 1 or Type 2 diabetes (combined) recorded as having ever had cardiac revascularisation.

Year	Cardiac Revascularisation (%)
2016	6.9
2015	6.9
2014	6.9
2013	6.8
2012	6.7
2011	6.6
2010	6.4
2009	6.3
2008	6.1
2007	5.9

Stroke

14,352 (5.0%) people with diabetes were recorded as having ever had a cerebrovascular accident (stroke), an increase in numbers, but a similar percentage to that in previous surveys (5.0% in 2015, 4.9% in 2014, 5.0% in 2013, 4.9% in 2012 and 2011, 5.0% in 2010 and 5.1% in each year between 2006 and 2011).

Table 57. Percentage of people with Type 1 or Type 2 diabetes who were recorded as ever having had a stroke, by NHS Board and diabetes type, ranked from low to high by percentage among people with Type 2 diabetes.

NHS Board	Recorded as having had a stroke			
	Type 1 diabetes		Type 2 diabetes	
	Number	%	Number	%
Orkney	2	1.8	29	2.8
Western Isles	8	4.1	50	4.1
Shetland	1	0.8	45	4.6
Grampian	55	1.6	1,137	4.6
Dumfries and Galloway	19	2.0	398	4.8
Lanarkshire	80	1.9	1,718	5.0
Forth Valley	33	1.8	757	5.1
Tayside	46	2.2	1,076	5.1
Highland	40	2.0	760	5.1
Fife	46	2.2	1,035	5.4
Ayrshire and Arran	62	2.7	1,175	5.6
Greater Glasgow and Clyde	137	2.2	3,141	5.6
Lothian	100	2.1	2,003	5.8
Borders	22	3.2	377	6.4
Scotland	651	2.1	13,701	5.3

Kidney Function and Disease

Serum Creatinine

Serum creatinine was recorded in the previous 15 months for 93.1% (267,452) of patients aged over 11 years of age (Table 58).

Table 58. Percentage of people with Type 1 or Type 2 diabetes who have a record of serum creatinine within the previous 15 months, by NHS board and diabetes type, ranked from low to high by percentage among people with Type 2 diabetes.

NHS Board	Recorded within previous 15 months				Total
	Type 1 diabetes		Type 2 diabetes		
	Number	%	Number	%	
Orkney	109	97.3	1,026	97.9	1,135
Dumfries and Galloway	845	92.5	8,087	96.9	8,932
Borders	620	92.7	5,645	96.1	6,265
Western Isles	156	84.3	1,172	96.1	1,328
Grampian	2,860	87.6	23,700	95.5	26,560
Tayside	1,767	87.3	20,008	95.4	21,775
Fife	1,826	90.3	18,085	94.6	19,911
Greater Glasgow and Clyde	5,336	87.8	52,664	94.3	58,000
Lanarkshire	3,390	86.0	32,065	94.3	35,455
Lothian	3,974	87.4	32,746	94.3	36,720
Shetland	114	91.2	925	93.8	1,039
Forth Valley	1,556	89.6	13,817	93.6	15,373
Ayrshire and Arran	1,752	80.8	19,198	90.9	20,950
Highland	1,396	72.7	12,613	85.3	14,009
Scotland	25,701	86.5	241,751	93.8	267,452

Note: Excludes children under 12 years of age or patients who have no date of birth recorded (type1 n = 1189, Type 2 n = 102).

Table 59. Percentage of people with diabetes (Type 1 and Type 2 combined) who had a record of serum creatinine within the previous 15 months.

Year	Recorded within previous 15 months (%)	Total eligible population
2016	93.1	287,336
2015	94.1	280,003
2014	94.4	272,651
2013	93.3	264,695
2012	92.6	255,640
2011	91.2	244,800
2010	90.8	235,198
2009	90.0	225,635
2008	90.3	218,903
2007	88.6	208,652

Note: Excludes children under 12 years of age or patients who have no date of birth recorded (n=1292). Figures prior to 2009 reported on those with all types of diabetes mellitus. The figures for 2009 and onwards report only on those with Type 1 and Type 2 diabetes.

Urinary Microalbuminuria

Table 60 shows information on the recording of microalbuminuria.

Table 60. Number and percentage of people with Type 1 or Type 2 diabetes who have a record of estimated urinary microalbumin value available on SCI-DC within the previous 15 months, by NHS board and diabetes type, ranked from high to low by percentage among people with Type 2 diabetes.

NHS Board	Recorded within previous 15 months				Total
	Type 1 diabetes		Type 2 diabetes		
	Number	%	Number	%	
Tayside	1,367	67.5	16,904	80.6	18,271
Orkney	77	68.8	830	79.2	907
Grampian	2,205	67.6	18,867	76.0	21,072
Lothian	3,371	74.1	25,484	73.4	28,855
Western Isles	104	56.2	893	73.2	997
Dumfries and Galloway	628	68.7	6,101	73.1	6,729
Fife	1,496	73.9	13,772	72.1	15,268
Ayrshire and Arran	1,175	54.2	15,128	71.6	16,303
Forth Valley	1,161	66.9	10,502	71.1	11,663
Highland	1,108	57.7	10,385	70.2	11,493
Greater Glasgow and Clyde	3,680	60.6	38,477	68.9	42,157
Shetland	96	76.8	646	65.5	742
Lanarkshire	2,103	53.3	22,191	65.3	24,294
Borders	244	36.5	317	5.4	561
Scotland	18,815	63.3	180,497	70.1	199,312

Note: Excludes children under 12 years of age or patients who have no date of birth recorded (type1 n = 1189, Type 2 n = 102). In some cases, urinary microalbumin was estimated from albumin/creatinine ratio (ACR).

Table 61. Number and percentage of people with Type 1 or Type 2 diabetes who have a record of estimated glomerular filtration rate (eGFR) available on SCI-Diabetes within the previous 15 months, by NHS board and diabetes type, ranked by decreasing percentage of people with Type 2 diabetes.

NHS Board	Recorded within previous 15 months				Total
	Type 1 diabetes		Type 2 diabetes		
	Number	%	Number	%	
Dumfries and Galloway	809	94.5	8,085	96.9	8,894
Orkney	98	93.3	1,008	96.2	1,106
Grampian	2,728	89.0	23,694	95.5	26,422
Tayside	1,642	86.9	20,002	95.4	21,644
Western Isles	141	81.0	1,161	95.2	1,302
Greater Glasgow and Clyde	5,037	88.1	52,654	94.3	57,691
Fife	1,710	89.5	18,009	94.2	19,719
Shetland	109	91.6	925	93.8	1,034
Forth Valley	1,457	89.6	13,813	93.6	15,270
Lothian	3,789	88.0	32,272	92.9	36,061
Highland	1,492	84.0	13,696	92.6	15,188
Lanarkshire	3,145	85.8	31,482	92.6	34,627
Borders	533	84.9	5,212	88.7	5,745
Ayrshire and Arran	1,432	71.1	16,081	76.1	17,513
Scotland	24,122	86.6	238,094	92.4	262,216

End Stage Renal Failure

End stage renal failure implies a need for renal dialysis or transplantation and may occur as a consequence of diabetic nephropathy or from other causes of kidney disease.

Table 62. Percentage of people with Type 1 or Type 2 diabetes recorded as having end stage renal failure, by NHS board and diabetes type, ranked by percentage of people with Type 2 diabetes.

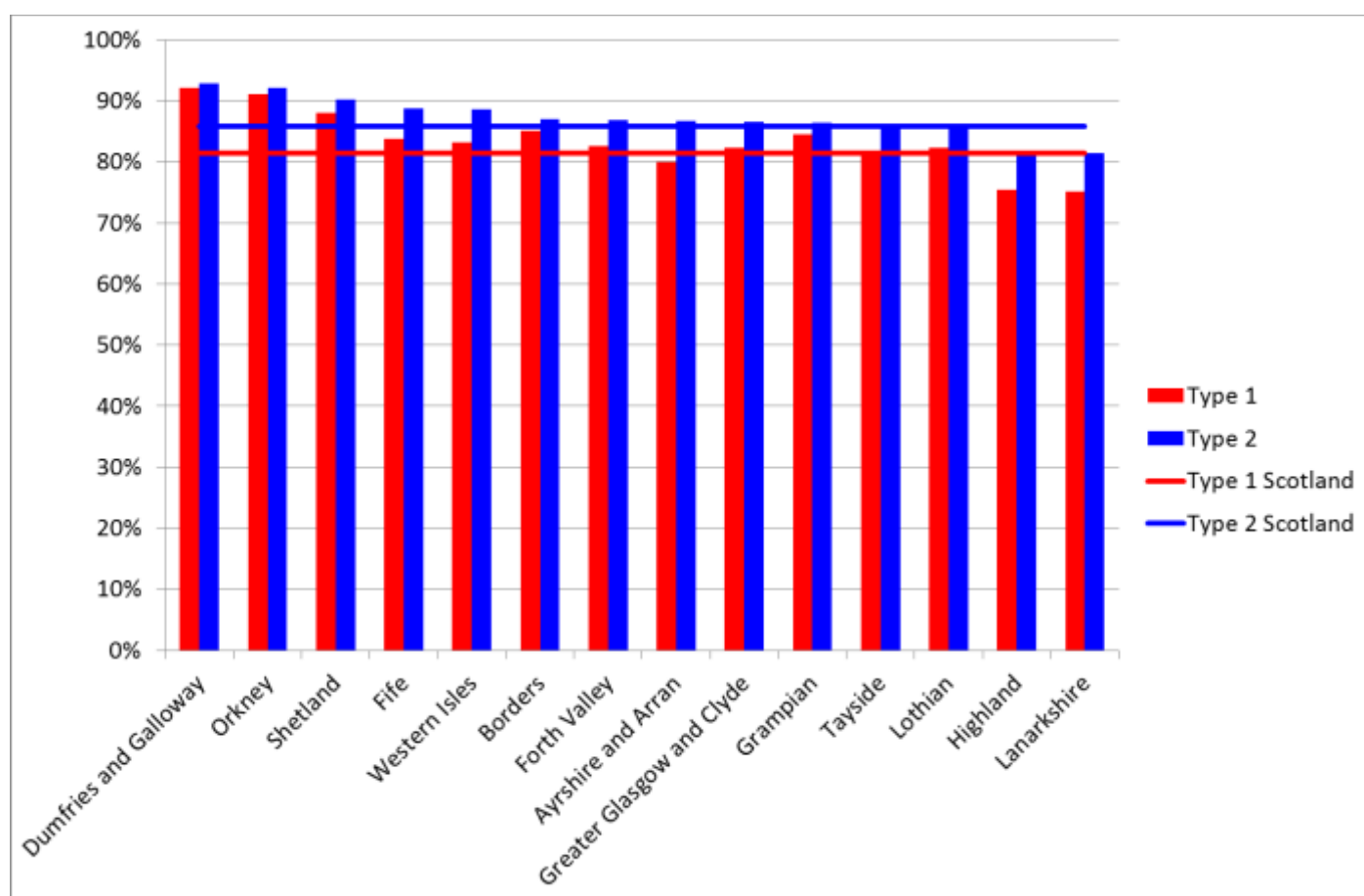
NHS Board	Recorded as having end stage renal failure			
	Type 1 diabetes		Type 2 diabetes	
	Number	%	Number	%
Orkney	2	1.8	3	0.3
Ayrshire and Arran	36	1.6	80	0.4
Shetland	1	0.8	4	0.4
Highland	26	1.3	70	0.5
Lanarkshire	62	1.5	167	0.5
Forth Valley	28	1.5	73	0.5
Fife	21	1.0	97	0.5
Borders	13	1.9	30	0.5
Dumfries and Galloway	16	1.7	48	0.6
Grampian	56	1.6	145	0.6
Tayside	33	1.6	131	0.6
Lothian	48	1.0	229	0.7
Greater Glasgow and Clyde	92	1.5	384	0.7
Western Isles	3	1.5	11	0.9
Scotland	437	1.4	1,472	0.6

Diabetic Eye Screening and Disease

Diabetic Retinal Screening

84.1% of patients eligible for screening had a record of eye screening through the retinal screening service recorded on SCI-Diabetes in the previous 15 months, including those attending ophthalmology services (Table 64).

Figure 29. Percentage of people with Type 1 or Type 2 diabetes with a record of diabetic retinopathy screening within the previous 15 months through retinal screening service, including those attending ophthalmology clinics and those suspended, by NHS Board and diabetes type, ranked from high to low by percentage among people with Type 2 diabetes.



Note: Excludes patients under 18 years of age and patients whose date of birth has not been recorded (type1 n = 3040, Type 2 n = 130).

Table 63 shows the number and proportion of patients of appropriate age (≥ 12 years) who were either screened, were getting eye-care via specialist services or were deliberately (for clinical or social reasons) suspended from screening as a proportion of the total number of patients who had a record of date of birth and were over 12 years of age.

Table 63. Number and percentage of people with Type 1 and Type 2 diabetes of appropriate age (≥ 12 years) who were either recorded as having had diabetic retinopathy screening within the previous 15 months, were attending specialist ophthalmology clinics or were appropriately suspended from screening as a proportion of the total number of patients who had a record of date of birth and were over 12 years of age; by NHS Board and diabetes type, ranked by decreasing percentage of people with Type 2 diabetes.

NHS Board	Type 1 diabetes		Type 2 diabetes		All (Type 1 and Type 2)		Not recorded
	Number	%	Number	%	Number	%	
Dumfries and Galloway	842	92.1	7,753	92.9	8,595	92.8	666
Orkney	102	91.1	965	92.1	1,067	92.0	93
Shetland	110	88.0	889	90.2	999	89.9	112
Fife	1,696	83.8	16,974	88.8	18,670	88.3	2,465
Western Isles	154	83.2	1,081	88.6	1,235	87.9	170
Borders	569	85.1	5,116	87.1	5,685	86.9	860
Forth Valley	1,433	82.5	12,823	86.8	14,256	86.4	2,247
Ayrshire and Arran	1,734	80.0	18,328	86.8	20,062	86.1	3,229
Greater Glasgow and Clyde	5,002	82.3	48,315	86.5	53,317	86.1	8,587
Grampian	2,760	84.6	21,457	86.4	24,217	86.2	3,872
Tayside	1,646	81.3	17,920	85.5	19,566	85.1	3,422
Lothian	3,745	82.3	29,677	85.4	33,422	85.1	5,870
Highland	1,449	75.5	12,072	81.6	13,521	80.9	3,185
Lanarkshire	2,965	75.2	27,683	81.4	30,648	80.8	7,298
Scotland	24,207	81.5	221,053	85.8	245,260	85.4	42,076

Note: Excludes children under 12 years of age or patients who have no date of birth recorded (Type 1 n = 1189, Type 2 n = 102)

Table 64. Numbers of patients eligible for retinopathy screening, numbers screened and percentages of those who had a record of screening (Type 1 and Type 2 combined), ranked from high to low by percentage of screened patients.

NHS Board	Eligible for screening	Screened (n)	Screened (%)
Dumfries and Galloway	8,352	7,686	92.0
Orkney	1,071	978	91.3
Shetland	1,032	920	89.1
Fife	19,169	16,704	87.1
Western Isles	1,250	1,080	86.4
Forth Valley	15,885	13,638	85.9
Grampian	26,716	22,844	85.5
Ayrshire and Arran	21,705	18,476	85.1
Borders	5,728	4,868	85.0
Greater Glasgow and Clyde	56,810	48,223	84.9
Lothian	36,348	30,478	83.9
Tayside	21,113	17,691	83.8
Highland	15,402	12,217	79.3
Lanarkshire	34,388	27,090	78.8
Scotland	264,969	222,893	84.1

Table 65 Number (and prevalence per 10,000 people with Type 1 diabetes) who are recorded as blind, ranked from low to high by prevalence of blindness caused by diabetes.

NHS Board	Diabetic cause		Non-diabetic cause		Not specified		Total		Total on register
	n	Prevalence	n	Prevalence	n	Prevalence	n	Prevalence	
Borders	0	0.00	0	0.00	2	28.86	2	28.86	693
Grampian	0	0.00	0	0.00	19	55.82	19	55.82	3,404
Highland	0	0.00	0	0.00	8	40.10	8	40.10	1,995
Lothian	0	0.00	0	0.00	16	33.98	16	33.98	4,709
Orkney	0	0.00	0	0.00	0	0.00	0	0.00	114
Shetland	0	0.00	0	0.00	0	0.00	0	0.00	131
Western Isles	0	0.00	0	0.00	0	0.00	0	0.00	194
Lanarkshire	1	2.41	0	0.00	32	77.24	33	79.65	4,143
Ayrshire and Arran	1	4.40	0	0.00	13	57.24	14	61.65	2,271
Forth Valley	1	5.50	0	0.00	7	38.53	8	44.03	1,817
Greater Glasgow and Clyde	4	6.36	0	0.00	25	39.76	29	46.13	6,287
Dumfries and Galloway	1	10.53	0	0.00	5	52.63	6	63.16	950
Tayside	4	19.17	0	0.00	11	52.71	15	71.87	2,087
Fife	5	23.76	0	0.00	6	28.52	11	52.28	2,104
Scotland	17	5.50	0	0.00	144	46.60	161	52.11	30,899

Table 66 Number (and prevalence per 10,000 people with Type 2 diabetes) who are recorded as blind, ranked by diabetic cause prevalence.

NHS Board	Diabetic cause		Non-diabetic cause		Not specified		Total		Total on register
	n	Prevalence	n	Prevalence	n	Prevalence	n	Prevalence	
Borders	0	0.00	0	0.00	30	51.04	30	51.04	5,878
Dumfries and Galloway	0	0.00	0	0.00	46	55.08	46	55.08	8,352
Grampian	0	0.00	1	0.40	205	82.58	206	82.98	24,825
Lanarkshire	0	0.00	0	0.00	260	76.32	260	76.32	34,069
Lothian	0	0.00	0	0.00	228	65.62	228	65.62	34,748
Orkney	0	0.00	0	0.00	6	57.25	6	57.25	1,048
Shetland	0	0.00	0	0.00	7	70.99	7	70.99	986
Western Isles	0	0.00	0	0.00	3	24.59	3	24.59	1,220
Ayrshire and Arran	1	0.47	1	0.47	106	50.18	108	51.13	21,123
Greater Glasgow and Clyde	3	0.54	8	1.43	321	57.49	332	59.46	55,838
Highland	1	0.68	0	0.00	108	73.03	109	73.70	14,789
Forth Valley	1	0.68	4	2.71	65	44.01	70	47.39	14,770
Tayside	2	0.95	9	4.29	114	54.38	125	59.63	20,963
Fife	3	1.57	0	0.00	131	68.52	134	70.09	19,119
Scotland	11	0.43	23	0.89	1,630	63.24	1,664	64.56	257,728

Table 67. Percentage of people with diabetes (Type 1 and Type 2 combined) who were recorded as having had eye-screening, ophthalmology care or an appropriate suspension from screening (depending on methodology at the time of the report).

Year	Recorded within previous 15 months (%)
2016	85.4
2015	85.8
2014	86.5
2013	86.8
2012	86.1
2011	85.6
2010	85.1
2009	80.6
2008	71.9
2007	83.6

Note: Excludes children under 12 years or patients who have no date of birth recorded (Type 1 n = 1189, Type 2 n = 102). 2008 data is taken only from digital imaging via Diabetes Retinopathy Screening. In 2007, data from any form of screening was acceptable.

Foot Complications

Table 68. Type 1 diabetes: Percentage of people with active foot disease, high, moderate or low foot risk score recorded in the previous 15 months, by NHS board, ranked by decreasing percentage foot risk score recorded.

NHS Board	Recorded as having active foot disease		Recorded as having high foot risk score		Recorded as having moderate foot risk score		Recorded as having low foot risk score		Foot risk score recorded	
	n	%	n	%	n	%	n	%	n	%
Shetland	1	0.9	3	2.8	6	5.6	98	90.7	108	82.4
Dumfries and Galloway	26	3.9	47	7.0	62	9.2	537	79.9	672	70.7
Western Isles	2	1.5	18	13.4	30	22.4	84	62.7	134	69.1
Forth Valley	37	3.0	80	6.5	116	9.4	1,004	81.2	1,237	68.1
Orkney	0	0.0	1	1.3	15	19.5	61	79.2	77	67.5
Highland	21	1.6	97	7.2	120	8.9	1,105	82.3	1,343	67.3
Tayside	31	2.3	107	8.1	131	9.9	1,053	79.7	1,322	63.3
Ayrshire and Arran	25	1.8	60	4.4	88	6.4	1,199	87.4	1,372	60.4
Borders	2	0.5	44	10.8	45	11.1	315	77.6	406	58.6
Greater Glasgow and Clyde	119	3.3	281	7.8	334	9.3	2,859	79.6	3,593	57.1
Grampian	20	1.0	102	5.3	148	7.6	1,666	86.1	1,936	56.9
Lanarkshire	74	3.1	159	6.8	222	9.4	1,896	80.6	2,351	56.7
Lothian	39	1.5	168	6.4	221	8.4	2,188	83.6	2,616	55.6
Fife	22	2.0	90	8.3	179	16.5	791	73.1	1,082	51.4
Scotland	419	2.3	1,257	6.9	1,717	9.4	14,856	81.4	18,249	59.1

Table 69. Type 2 diabetes: Percentage of people with active foot disease, high, moderate or low foot risk score recorded in the previous 15 months, by NHS board, ranked by decreasing percentage foot risk score recorded.

NHS Board	Recorded as having active foot disease		Recorded as having high foot risk score		Recorded as having moderate foot risk score		Recorded as having low foot risk score		Foot risk score recorded	
	n	%	n	%	n	%	n	%	n	%
Shetland	7	0.8	34	4.0	102	11.9	712	83.3	855	86.7
Tayside	194	1.1	1,123	6.5	3,307	19.2	12,636	73.2	17,260	82.3
Western Isles	19	1.9	202	20.7	310	31.8	444	45.5	975	79.9
Orkney	5	0.6	93	11.3	213	25.9	512	62.2	823	78.5
Highland	125	1.1	817	7.1	1,739	15.0	8,888	76.8	11,569	78.2
Dumfries and Galloway	78	1.2	315	4.9	910	14.0	5,187	79.9	6,490	77.7
Grampian	102	0.5	623	3.3	2,906	15.5	15,158	80.7	18,789	75.7
Ayrshire and Arran	100	0.6	458	2.9	1,469	9.3	13,793	87.2	15,820	74.9
Forth Valley	65	0.6	392	3.6	1,867	17.1	8,612	78.7	10,936	74.0
Lothian	209	0.8	1,352	5.3	4,087	16.1	19,811	77.8	25,459	73.3
Borders	21	0.5	257	6.0	482	11.2	3,525	82.3	4,285	72.9
Greater Glasgow and Clyde	700	1.7	2,333	5.8	6,613	16.4	30,587	76.0	40,233	72.1
Fife	172	1.3	985	7.5	3,294	25.1	8,673	66.1	13,124	68.6
Lanarkshire	390	1.8	1,080	4.9	2,999	13.6	17,641	79.8	22,110	64.9
Scotland	2,187	1.2	10,064	5.3	30,298	16.1	146,179	77.5	188,728	73.2

Foot Ulceration

13,497 (4.7%) people with Type 1 or Type 2 diabetes were reported to have had a foot ulcer (Table 70).

Table 70. Percentage of people with diabetes with a record of ever having had a foot ulcer, by NHS board and diabetes type, ranked by ascending percentage of people with Type 2 diabetes.

NHS Board	Recorded as ever having had a foot ulcer			
	Type 1 diabetes		Type 2 diabetes	
	Number	%	Number	%
Grampian	120	3.5	418	1.7
Ayrshire and Arran	117	5.2	463	2.2
Borders	47	6.8	147	2.5
Orkney	3	2.6	31	3.0
Shetland	3	2.3	30	3.0
Forth Valley	181	10.0	455	3.1
Dumfries and Galloway	66	6.9	260	3.1
Tayside	144	6.9	704	3.4
Highland	113	5.7	575	3.9
Fife	132	6.3	751	3.9
Greater Glasgow and Clyde	560	8.9	2,635	4.7
Lothian	331	7.0	1,742	5.0
Western Isles	10	5.2	72	5.9
Lanarkshire	710	17.1	2,677	7.9
Scotland	2,537	8.2	10,960	4.3

Table 71. Percentage of people with diabetes (Type 1 and Type 2 combined) who had a record of ever having had a foot ulcer.

Year	Recorded as ever having had a foot ulcer (%)
2016	4.7
2015	4.8
2014	4.9
2013	5.2
2012(a)	5.1
2011	4.3
2010	4.4
2009	4.3
2008	4.6
2007	4.7

Note: (a) The increase in recorded foot ulcers between 2011 and 2012 is likely to be due to better recording rather than a real increase in the number of foot ulcers.

Lower Limb Amputation

There were 2,055 (0.7%) patients recorded as having a major lower limb amputation (Table 72).

Table 72. Percentage of people with Type 1 or Type 2 diabetes with a record of ever having had a major lower limb amputation, by NHS board and diabetes type, ranked by ascending percentage of people with Type 2 diabetes.

NHS Board	Recorded as ever having had a lower limb amputation			
	Type 1 diabetes		Type 2 diabetes	
	Number	%	Number	%
Borders	8	1.2	26	0.4
Lothian	31	0.7	184	0.5
Lanarkshire	38	0.9	186	0.5
Orkney	1	0.9	6	0.6
Forth Valley	21	1.2	90	0.6
Grampian	38	1.1	160	0.6
Ayrshire and Arran	30	1.3	138	0.7
Tayside	28	1.3	147	0.7
Greater Glasgow and Clyde	69	1.1	398	0.7
Highland	33	1.7	115	0.8
Fife	25	1.2	155	0.8
Dumfries and Galloway	26	2.7	77	0.9
Shetland	1	0.8	10	1.0
Western Isles	1	0.5	13	1.1
Scotland	350	1.1	1,705	0.7

Table 73. Number and percentage of people with diabetes (Type 1 and Type 2 combined) who had a record of ever having had a major lower limb amputation.

Year	Lower limb amputation	
	Number	%
2016	2,055	0.7
2015	2,092	0.7
2014	2,111	0.8
2013	2,064	0.8
2012	1,854	0.7
2011	1,359	0.6
2010	1,250	0.5
2009	1,132	0.5
2008	1,051	0.5
2007	950	0.5

Other Statistics

My Diabetes My Way

“My Diabetes My Way” (www.mydiabetesmyway.scot.nhs.uk) is the NHS Scotland interactive diabetes website that helps to support people who have diabetes and their carers. The table below shows the number of people who had registered to access their own clinical information using the website by the end of 2016. Records access is a key objective of the Scottish Diabetes Improvement Plan.

Table 74. Numbers of people with Type 1 and Type 2 diabetes registered to access their clinical information using the “My Diabetes My Way” website by NHS Board ordered by decreasing total percentage of registered users.

NHS Board	Type 1			Type 2			Total		
	n	Pop.	%	n	Pop.	%	n	Pop.	%
Lothian	1,855	4,709	39.4	2,688	34,748	7.7	4,543	39457	11.5
Shetland	35	131	26.7	85	986	8.6	120	1117	10.7
Forth Valley	768	1,817	42.3	928	14,770	6.3	1,696	16587	10.2
Tayside	444	2,087	21.3	1,864	20,963	8.9	2,308	23050	10.0
Greater Glasgow and Clyde	2,021	6,287	32.1	4,071	55,838	7.3	6,092	62125	9.8
Western Isles	38	194	19.6	89	1,220	7.3	127	1414	9.0
Lanarkshire	1,361	4,143	32.9	1,844	34,069	5.4	3,205	38212	8.4
Fife	441	2,104	21.0	1,228	19,119	6.4	1,669	21223	7.9
Dumfries and Galloway	182	950	19.2	409	8,352	4.9	591	9302	6.4
Ayrshire and Arran	421	2,271	18.5	1,039	21,123	4.9	1,460	23394	6.2
Borders	118	693	17.0	287	5,878	4.9	405	6571	6.2
Highland	371	1,995	18.6	580	14,789	3.9	951	16784	5.7
Orkney	34	114	29.8	29	1,048	2.8	63	1162	5.4
Grampian	481	3,404	14.1	544	24,825	2.2	1,025	28229	3.6
Scotland	8,570	30,899	27.7	15,685	257,728	6.1	24,255	288,627	8.4

Note: The above figures show the number of patients who had registered to access their diabetes data at the end of 2016. Registration may be initiated by the patient via the My Diabetes My Way website, or by a clinician using SCI-Diabetes. Following registration, a patient must provide their consent to proceed and verify their email address. At this stage, a username and password are emailed to the patient.

At the end of 2016, 11,840 patients had accessed their results using “My Diabetes My Way”. During the final 3 months of 2016, a total of 4,750 (40.1% of active users) had logged in,

showing good levels of continued engagement. Healthcare providers across NHS Scotland are encouraged to raise awareness of My Diabetes My Way services amongst their patient cohorts.

My Diabetes My Way are currently offering to complete a mailout on behalf of GP Surgeries in order to make unregistered patients aware of the service. This mailout will be completed at no cost to the practice on verification of a patient list, provided by SCI-Diabetes.

Further information and awareness materials may be requested by emailing the My Diabetes My Way project team on mydiabetesmyway@nhs.net.

Table 75. Numbers of people with Type 1 and Type 2 diabetes registered to access and actively accessing their clinical information using the “My Diabetes My Way” website by year.

Year	Type 1	Type 2	Total	Yearly Change in registered users (%)	Active users	Yearly change in active users (%)
2016	8,570	15,685	24,255	43.2	11,840	58.6
2015	6,456	10,478	16,934	68.6	7,463	101.8
2014	2,722	7,383	10,105	55.0	3,699	92.4
2013	2,195	4,325	6,520	N/A	1,923	N/A

Note: N/A (not available) figures for change in 2013 are due to Scottish Diabetes Survey reporting on My Diabetes My Way commencing in that year.

Scottish Diabetes Research Network (SDRN) Research Register

The SDRN research register allows people with diabetes to indicate their interest in taking part in research on diabetes in Scotland, including clinical trials. The table below shows the numbers who had joined the register by the end of 2016. It should be noted that many other people with diabetes who are not necessarily on this registry also take part in research.

Table 76. Numbers of people with Type 1 and Type 2 diabetes who had joined the SDRN diabetes research register by the end of 2016, by NHS Board, Scotland.

NHS Board	Type 1	Type 2	Total
Ayrshire and Arran	13	21	34
Borders	9	19	28
Dumfries and Galloway	136	593	729
Fife	174	301	475
Forth Valley	74	147	221
Grampian	155	604	759
Greater Glasgow and Clyde	473	837	1,310
Highland	474	837	1,311
Lanarkshire	175	580	755
Lothian	883	1,630	2,513
Orkney	0	0	0
Shetland	5	1	6
Tayside	346	1,576	1,922
Western Isles	5	0	5
Scotland	2,922	7,146	10,068

Care Processes

Quarterly reports of 9 processes and outcomes of care are now being reported back to each NHS board. There are 12 measures within this. The report at the end of 2016 is described below.

The processes and outcomes described in this report represent work in progress and need to be considered as such.

Table 77. Applicability of Care Processes

Diagnosis and Age category	Care processes applicable
Type 1 and Other Age 0-11	Processes 1 and 2
Type 1 and Other Age 12-17	Processes 1 to 6
Type 1 Age 18+, Type 2 and Other Age 18+	All 9 Processes

Other = any other frank diabetes type not included elsewhere.

Measure 1

Percentage of people with diabetes who received all 9 processes of care measurements for diabetes in the prior 15 months – adjusted for and presented in defined age ranges.

Methodology

Included population = all patients of any age with diabetes are included.

List of Care processes

1. HbA1c
2. Weight (BMI)
3. Blood Pressure
4. Smoking Status
5. Retinopathy Screening*
6. Urinary Albumin Test**
7. Creatinine
8. Total Cholesterol
9. Foot risk

*Retinopathy Screening = Latest DRS Screening Status is "Attended - Successfully Screened" or "Attended - Unsuccessfully Screened". Note – if the patient has been suspended from eye screening this is counted as having received this "process of care".

**Urinary Albumin test = any of the following: Albumin-Creatinine Ratio (ACR), Microalbumin Concentration, Protein-Creatinine Ratio (PCR) or Total Urinary Protein.

Notes

Where no data is shown in the bar-chart, this could indicate that no patients were found that met the inclusion criteria or it could indicate that of those that did meet the criteria, none had the required number of processes.

Figure 30. Measure 1 Type 1 and Other Age 0-11 by NHS Board

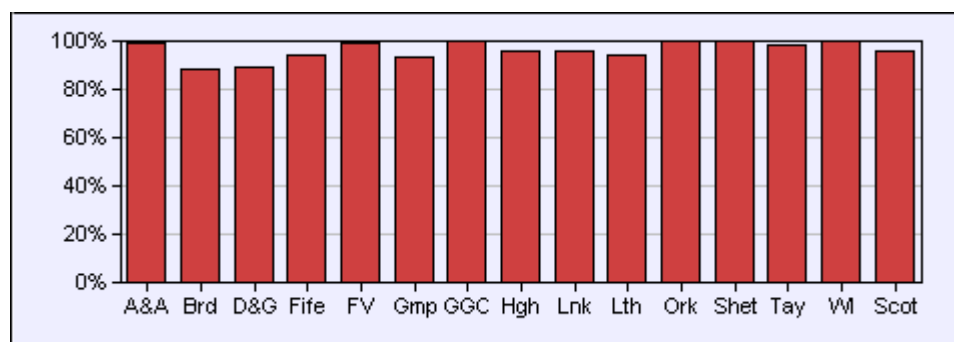


Figure 31. Measure 1 Type 1 and Other Age 12-17 by NHS Board

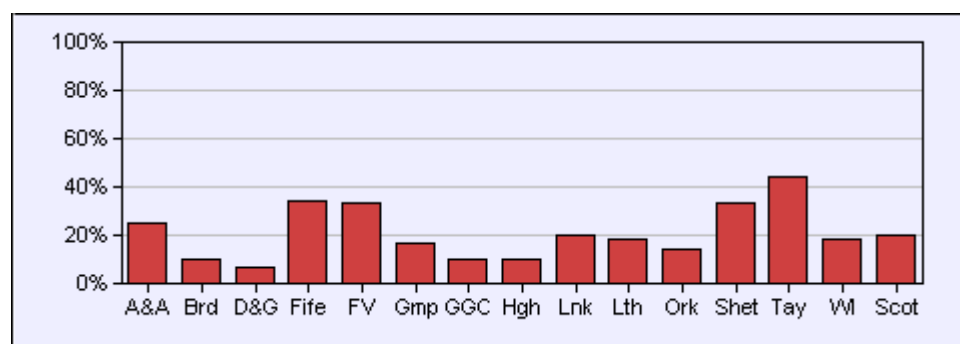


Figure 32. Measure 1 Type 1 Age 18+ by NHS Board

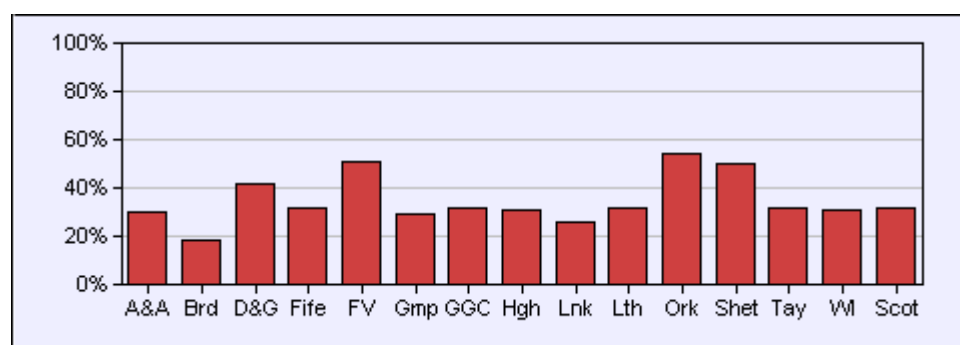
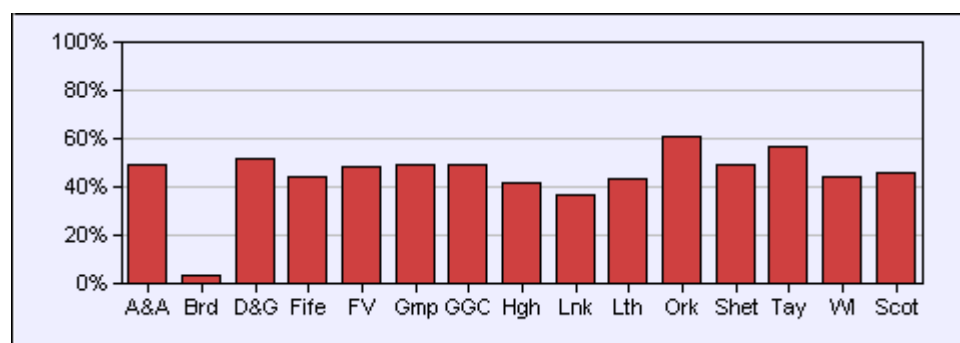


Figure 33. Measure 1 Type 2 and Other Age 18+ by NHS Board



Measure 2

Percentage of people with diabetes with an HbA1c <58 mmol/mol at 1 year post diagnosis - presented in defined age ranges.

Methodology

Included population = patients with a duration of diabetes between 1 and 2 years on the date of the quarterly report, and a recording of HbA1c within (+/-) 90 days of their 1st anniversary of diagnosis.

Numerator = number of patients in each age/type cohort whose latest HbA1c was <58 mmol/mol.

Denominator = the total number of patients (who had an anniversary HbA1c) in each age/type cohort.

Notes

Where no data is shown in the bar-chart, this could indicate that no patients were found that met the inclusion criteria or that none of those who did meet the inclusion criteria had an anniversary HbA1c <58 mmol/mol.

Figure 34. Measure 2 Type 1 and Other Age 0-5 by NHS Board

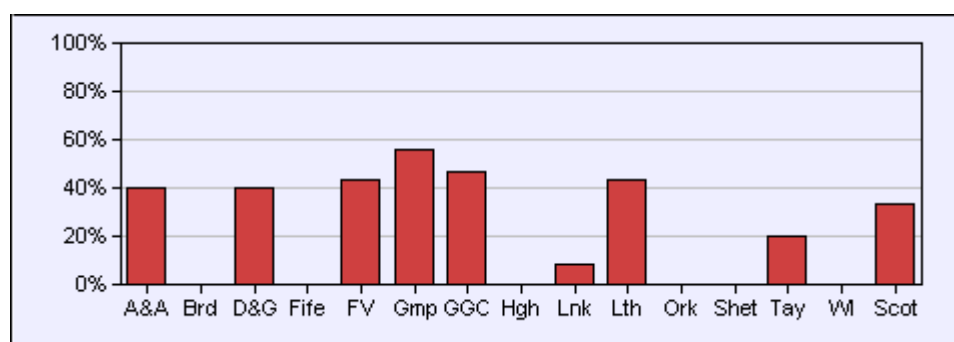


Figure 35. Measure 2 Type 1 and Other Age 6-11 by NHS Board

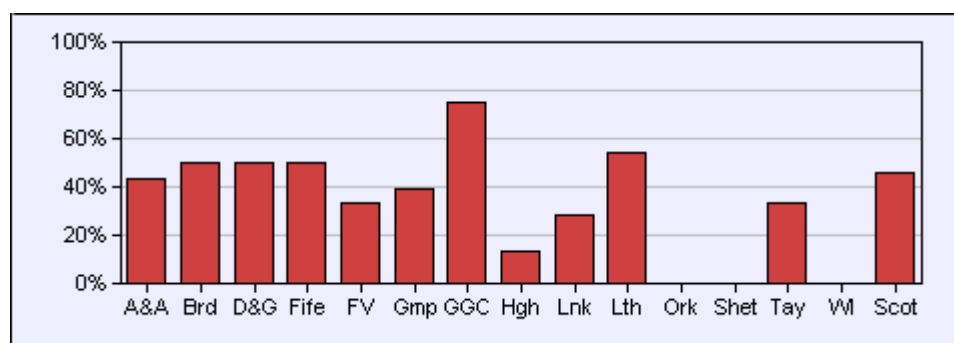


Figure 36. Measure 2 Type 1 and Other Age 12-17 by NHS Board

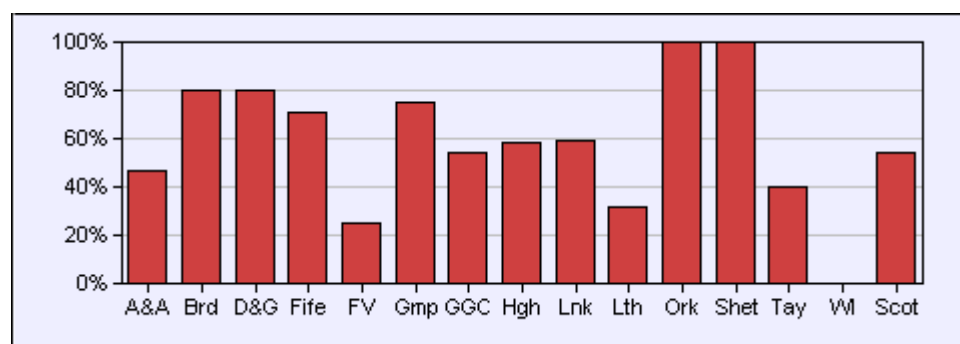


Figure 37. Measure 2 Type 1 Age 18+ by NHS Board

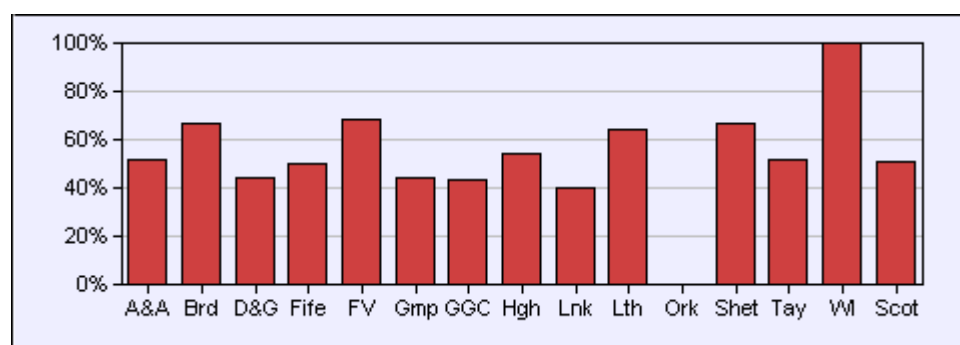
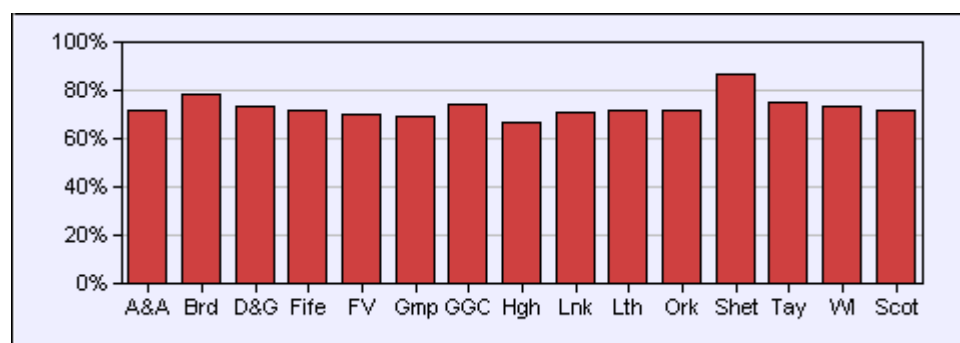


Figure 38. Measure 2 Type 2 and Other Age 18+ by NHS Board



Measure 3

Percentage of people with diabetes with good and poor control (HbA1c <58 mmol/mol and >75 mmol/mol) - presented in defined age ranges.

Methodology

Included population = all patients of any age with diabetes are included.

Numerator 1 = patients in each age/type cohort whose latest HbA1c in the prior 15 months was <58 mmol/mol or >75 mmol/mol

Denominator 1 = the number of tested patients in each age/type cohort – those with an HbA1c result in the prior 15 months.

Numerator 2 = “Not Recorded” patients – those who have no HbA1c recorded in the prior 15 months

Denominator 2 = the total number of patients in each age/type cohort (both tested and untested).

Notes

Where no data is shown in the bar-chart, this could indicate that no patients were found in that age-range or that the latest HbA1c of those who were found was neither <58 nor >75 (i.e. was in the 58-75 range).

Figure 39. Measure 3 Type 1 and Other Age 0-5 by NHS Board

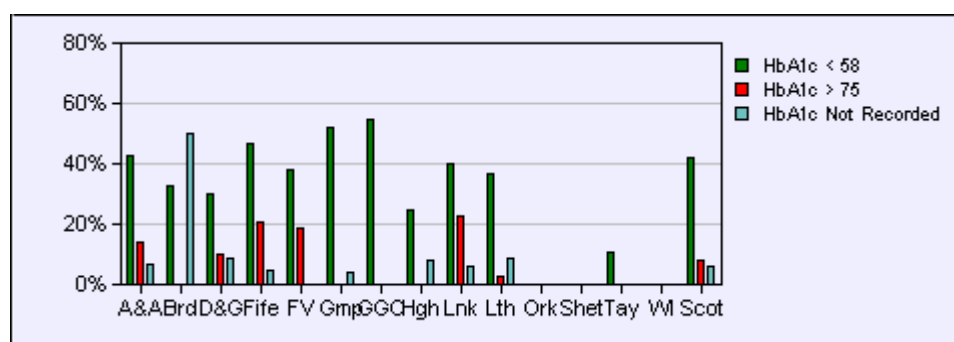


Figure 40. Measure 3 Type 1 and Other Age 6-11 by NHS Board

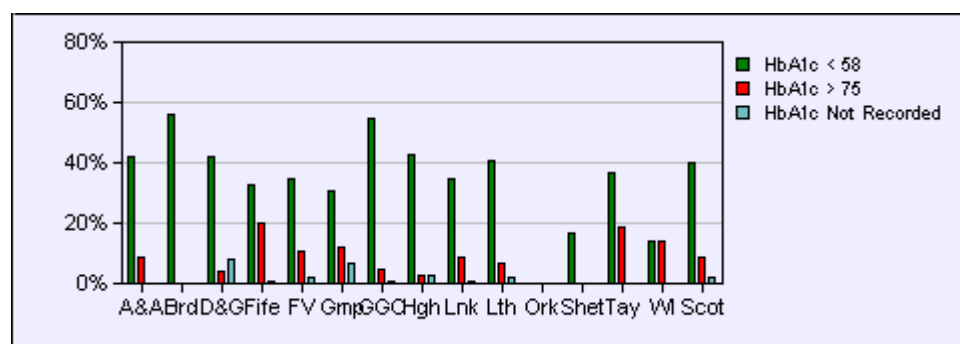


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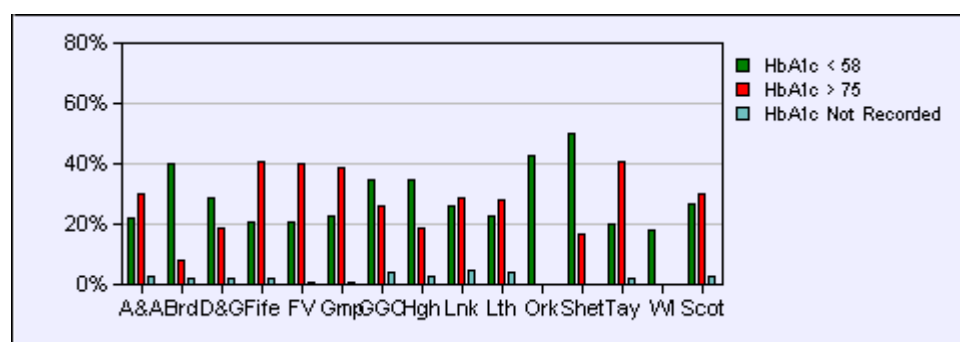


Figure 42. Measure 3 Type 1 Age 18+ by NHS Board

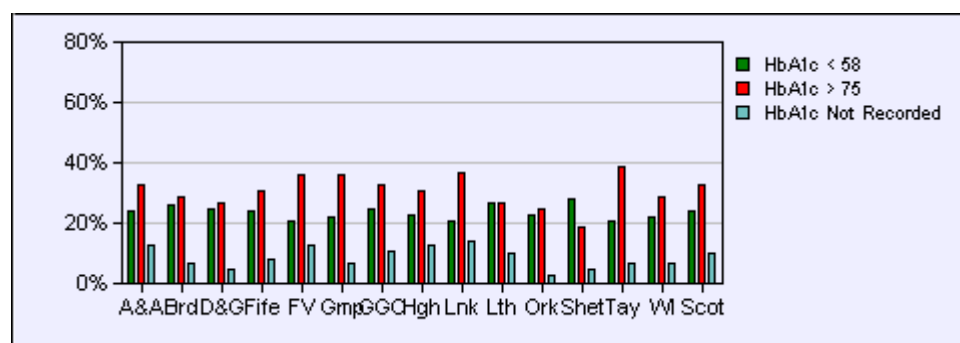
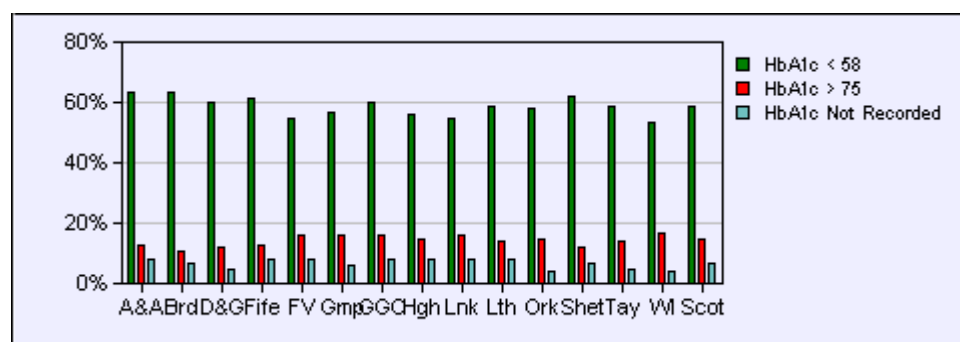


Figure 43. Measure 3 Type 2 and Other Age 18+ by NHS Board



Measure 4

Percentage of people with diabetes who have a smoking status of “Current Smoker” recorded in the prior 15 months - presented in defined age ranges.

Methodology

Included population = patients aged 12 or over are included.

Numerator = patients in each age/type cohort whose latest smoking status in the prior 15 months was “Current Smoker”

Denominator = the total number of patients in each age/type cohort who had a smoking status recorded in the prior 15 months.

Notes

Where no data is shown in the bar-chart, this could indicate that no patients were found in that age-range or that no patients in that age-range were recorded as “Current Smokers” in the prior 15 months.

Figure 44. Measure 4 Type 1 and Other Age 12-17 by NHS Board

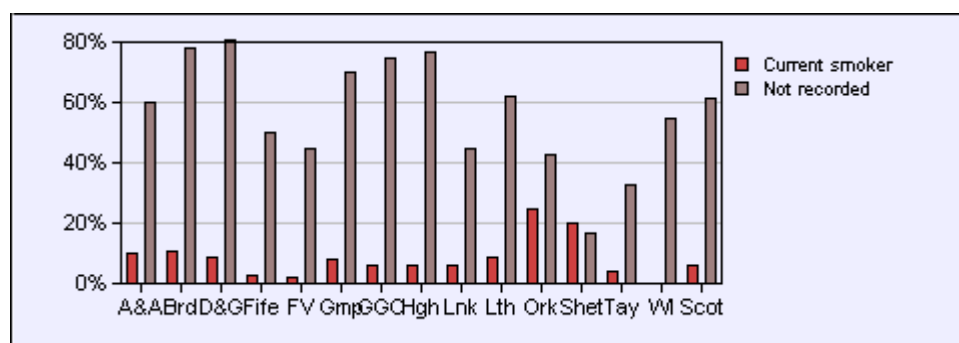


Figure 45. Measure 4 Type 1 Age 18+ by NHS Board

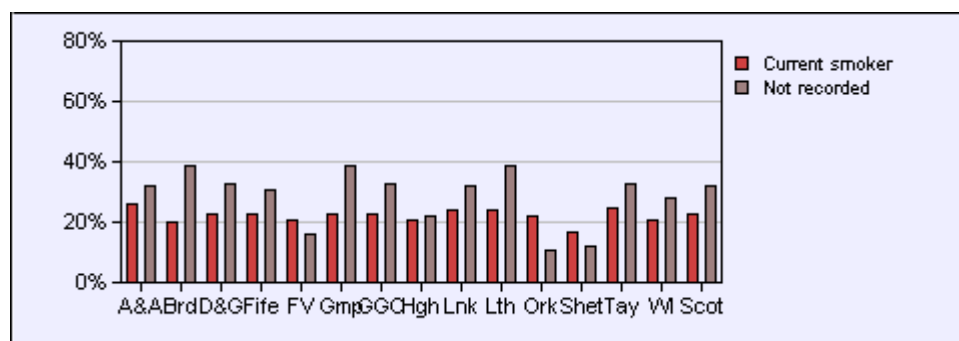
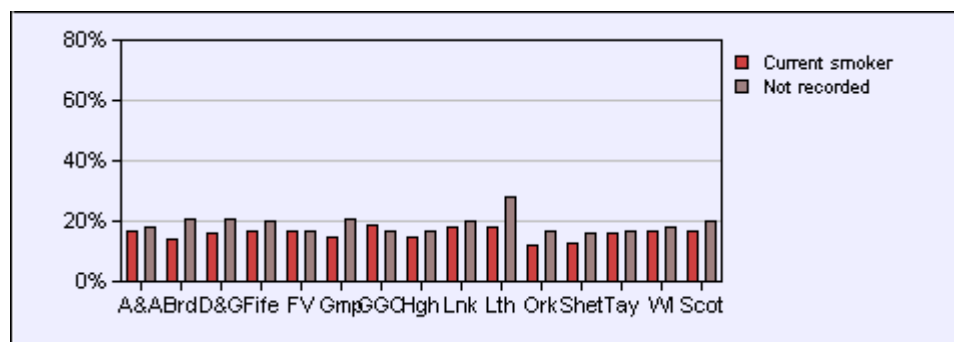


Figure 46. Measure 4 Type 2 and Other Age 18+ by NHS Board



Measure 5

Percentage of people with diabetes aged 50 to 70 with a total cholesterol <5mmol/l AND a systolic blood pressure <140 mmHg in the prior 15 months

Methodology

Included population = all patients aged ≥ 50 and < 70 years are included.

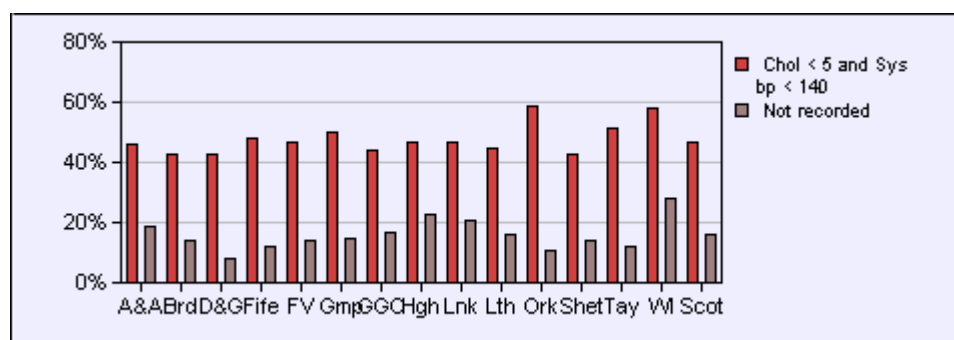
Numerator 1 = the number of patients aged 50-70 years whose latest cholesterol was <5mmol AND whose latest SBP was <140

Denominator 1 = the total number of patients aged 50-70 years who had both a cholesterol value and a SBP result recorded in the prior 15 months.

Numerator 2 = "Not Recorded" - the number of patients aged 50-70 years who did NOT have both a cholesterol AND a SBP result recorded in the prior 15 months.

Denominator 2 = the total cohort of patients with diabetes aged 50-70 years.

Figure 47. Measure 5 Age 50-70 by NHS Board



Measure 6

Percentage of people with diabetes and a record of new foot ulcers (recorded in the prior year) - presented in defined age ranges.

Methodology

Included population = all patients of any age with diabetes are included.

Numerator = number of patients in each age/type cohort with a new foot ulcer recorded on the SCI-Diabetes Ulcer Management screen

Denominator = the total number of patients in each age/type cohort.

Notes

Results are limited to patients with a new foot ulcer (within 12 months prior to the audit report date) recorded via the Ulcer Management screens and thus may not be a truly comprehensive representation of foot ulcer incidence.

Figure 48. Measure 6 Type 1 and Other Age 0-17 by NHS Board

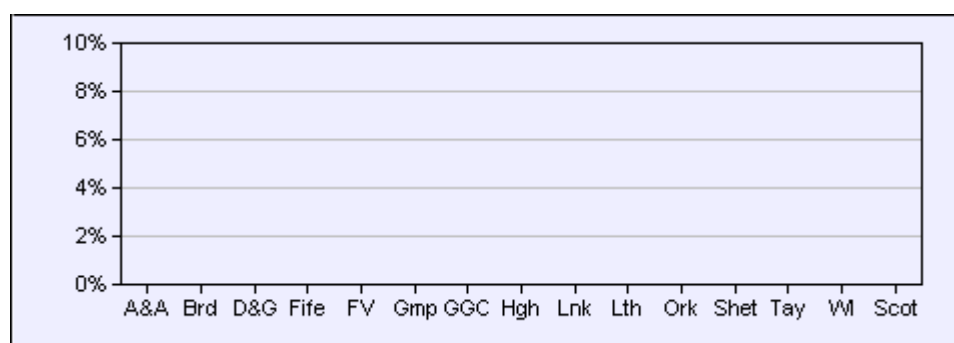


Figure 49. Measure 6 Type 1 Age 18+ by NHS Board

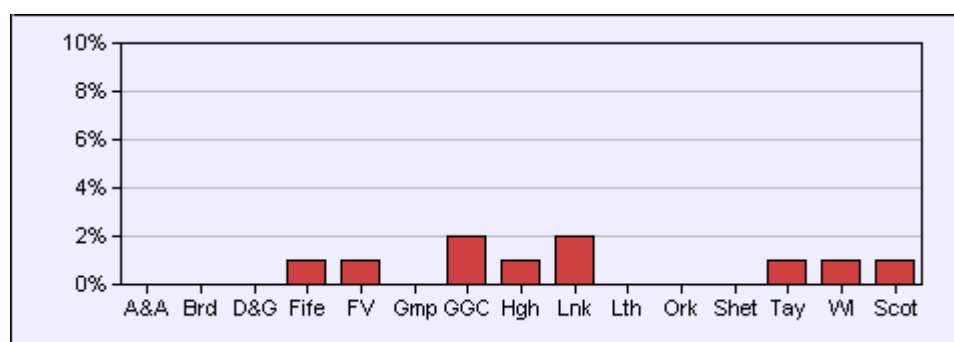
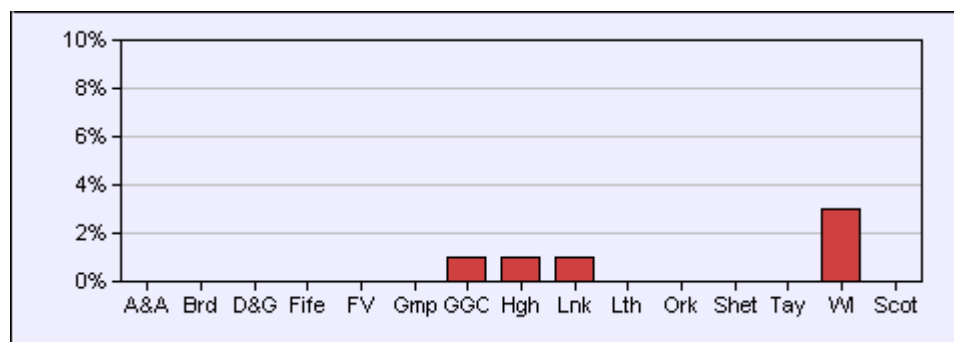


Figure 50. Measure 6 Type 2 and Other Age 18+ by NHS Board



Measure 7

Percentage of people with diabetes eligible for diabetic retinopathy screening (DRS) who were screened within last 15 months - presented in defined age ranges.

Methodology

Included population = all patients aged 12 or over who have not been suspended from eye-screening. Those flagged as "Temporarily Unavailable" are still considered eligible and included in denominator.

Numerator = number of eligible patients in each age/type cohort who had a DRS screening attendance recorded in the prior 15 months

Denominator = the total number of DRS eligible patients in each age/type cohort

Notes

DRS attendance = "Attended - Successfully Screened" or "Attended - Unsuccessfully Screened". Both are considered actual screenings.

Figure 51. Measure 7 Type 1 and Other Age 12-17 by NHS Board

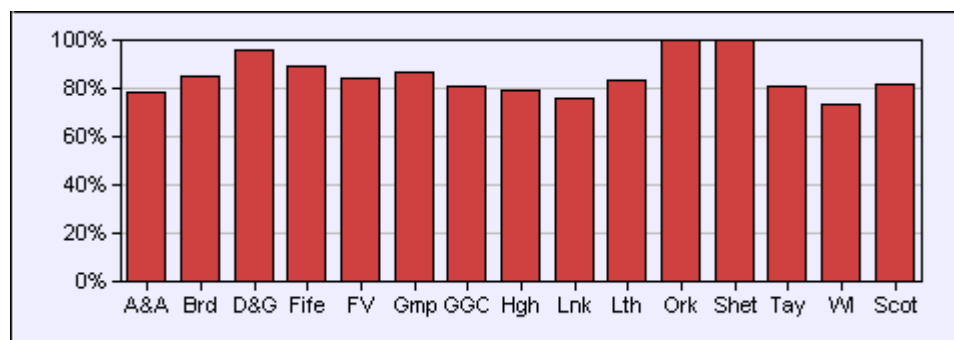


Figure 52. Measure 7 Type 1 Age 18+ by NHS Board

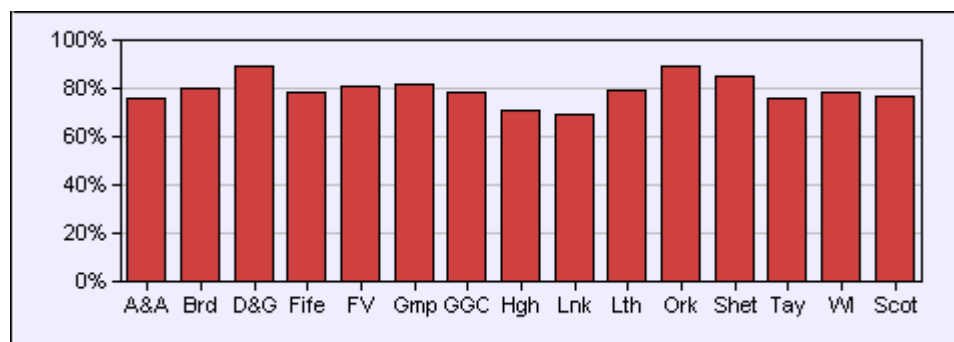
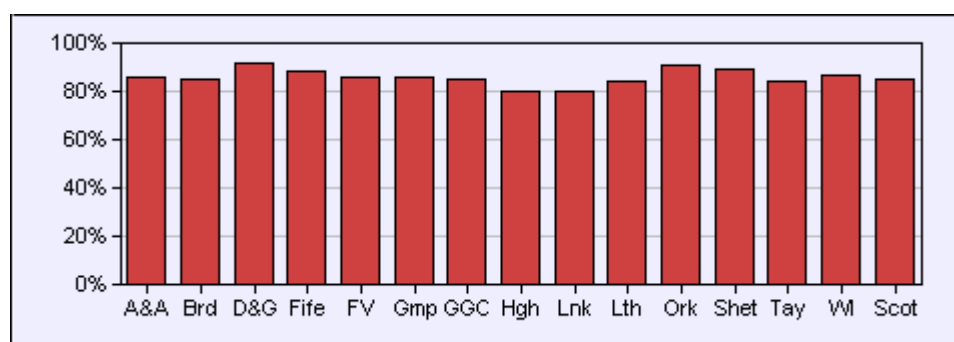


Figure 53. Measure 7 Type 2 and Other Age 18+ by NHS Board



Measure 8

Percentage of people with diabetes who have end stage renal disease (ESRD) or requiring renal replacement therapy (RRT) - presented in defined age ranges.

Methodology

Included population = all patients of any age with diabetes are included.

Numerator = number of patients in each age/type cohort identified as having ESRD or requiring RRT

Denominator = the total number of patients in each age/type cohort.

Notes

ESRD/RRT is where any of the following is true:

- Data item "End Stage Renal Failure Date" is populated with any value
- Data item "Renal Replacement Therapy" is populated with any value
- Either serum creatinine was chronically greater than 500 $\mu\text{mol/l}$ or eGFR was less than 15 (stage 5 chronic kidney disease) on two occasions at least three months (93 days) apart within the previous 15 months (method from Scottish Diabetes Survey).

Figure 54. Measure 8 Type 1 and Other Age 0-17 by NHS Board

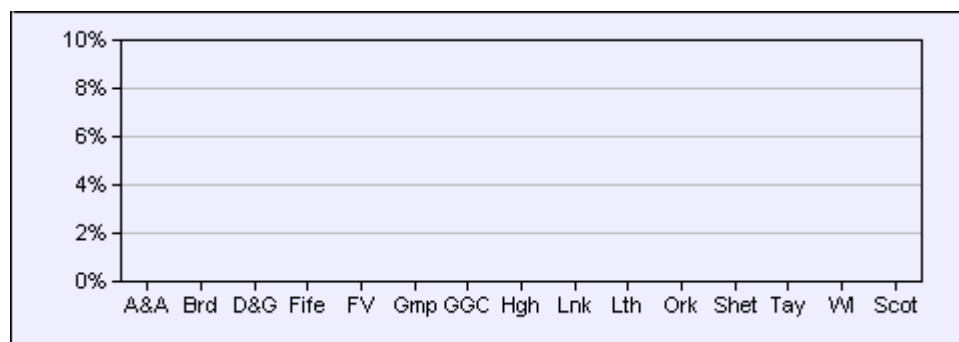


Figure 55. Measure 8 Type 1 Age 18+ by NHS Board

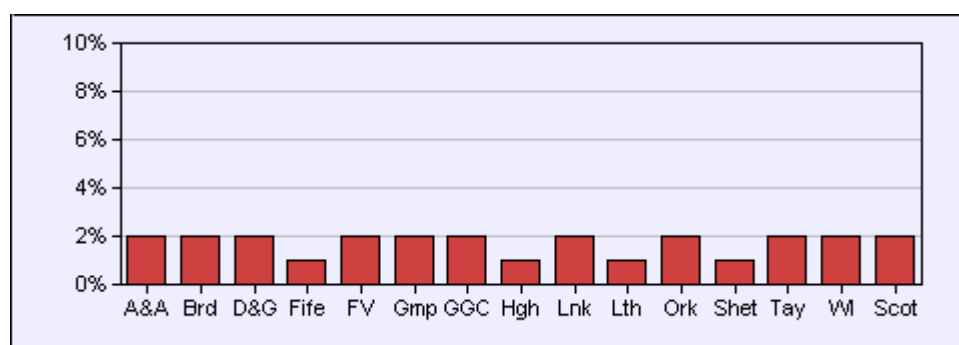
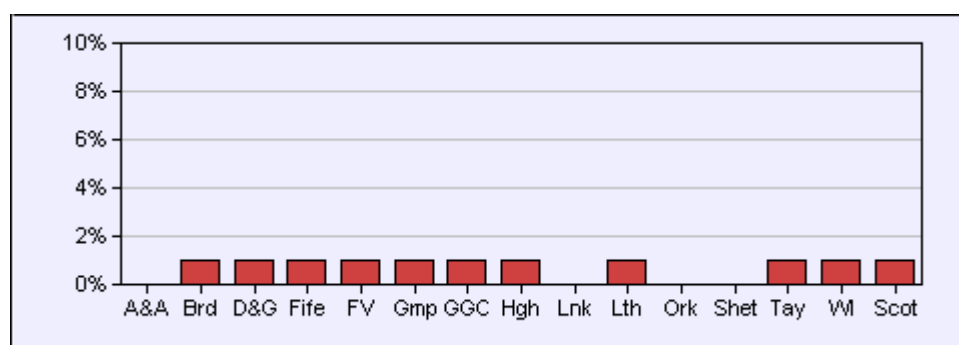


Figure 56. Measure 8 Type 2 and Other Age 18+ by NHS Board



Measure 9

Percentage of people with diabetes using CSII (Insulin Pump) therapy - presented in defined age ranges.

Methodology

Included population = all patients of any age with Type 1 diabetes are included.

Numerator = number of Type 1 patients in each age cohort identified as "Using an Insulin Pump Therapy Device"

Denominator = the total number of Type 1 patients in each age cohort.

Figure 57. Measure 9 Type 1 Age 0-17 by NHS Board

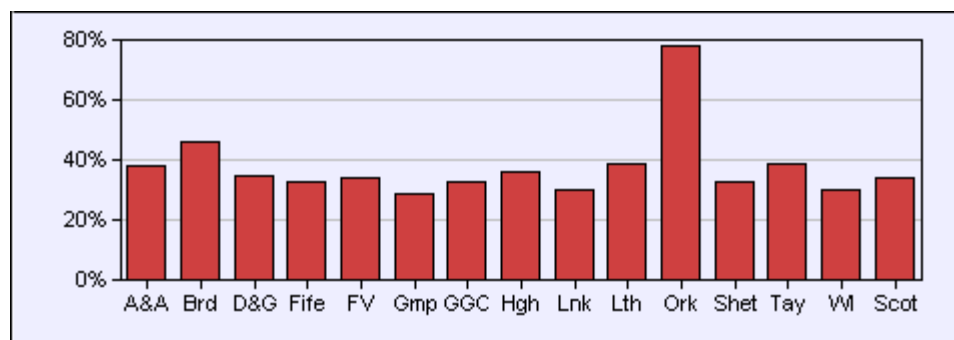
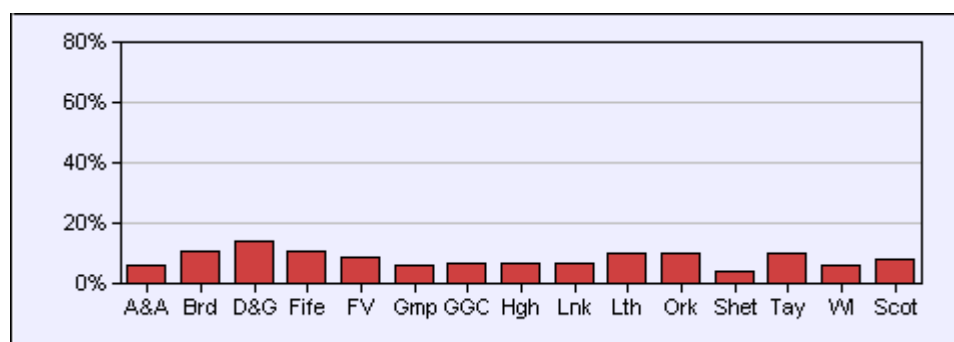


Figure 58. Measure 9 Type 1 Age 18+ by NHS Board



Measure 10

Percentage of people with diabetes with a BMI ≥ 30 who have lost $\geq 5\%$ body weight in the last year - presented in defined age ranges.

Methodology

Included population = patients who had a BMI ≥ 30 recorded any time in the prior 15 months who also have a weight that precedes their latest weight (which must be recorded in the prior year) by 12 months (± 90 days) are included.

Numerator = number of patients in each age/type cohort whose latest weight shows a $\geq 5\%$ reduction since their weight a year ago.

Denominator = the total number of patients in each age/type cohort who meet the required inclusion criteria (see above).

Notes

Patients where their weight has reduced by 5% or more in the last year as determined by:

- Weight "now" is current weight recorded any time within the last year.
- Weight "one year ago" is the weight record closest to Weight "now" - 12 months within the time window of ± 90 days (3 months).
- Patient meets the criteria if Weight "now" \leq (Weight "one year ago" - 5%).
- Only if both values can be determined will the calculation take place.

Figure 59. Measure 10 Type 1 and Other Age 0-17 by NHS Board

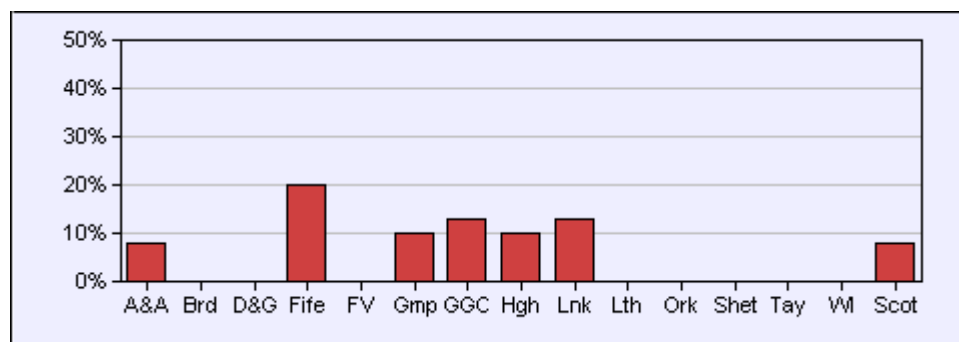


Figure 60. Measure 10 Type 1 Age 18+ by NHS Board

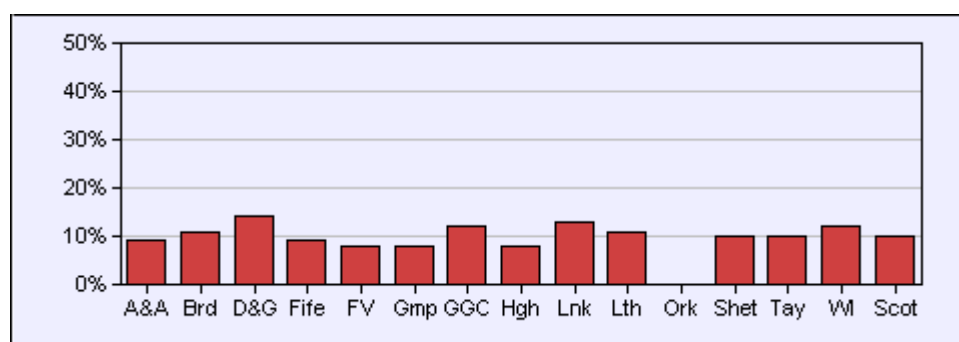
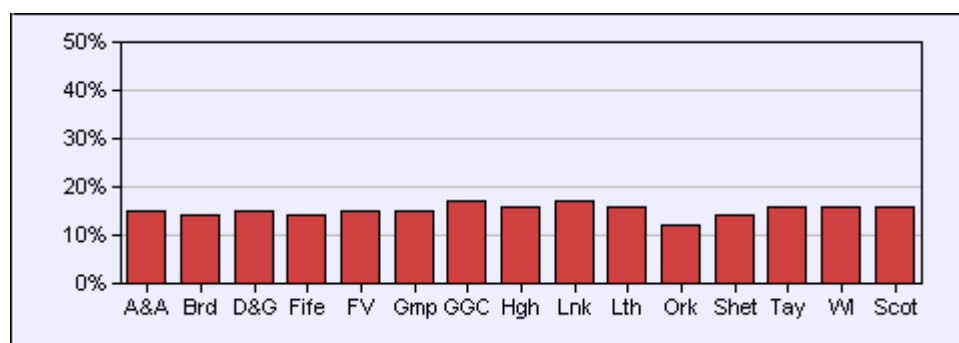


Figure 61. Measure 10 Type 2 and Other Age 18+ by NHS Board



Measure 11

Percentage of people with diabetes who have ever attended Level 3 structured education - presented in defined age ranges.

Methodology

Included population = all patients of any age with diabetes are included.

Numerator = number of patients in each age/type cohort who have at least one "Level 3" education record with "Education Status" = "Participated". The record may have been recorded at any time.

Denominator = the total number of patients in each age/type cohort.

Notes

An "Education Status" of "Participated" can only be recorded manually in SCI-Diabetes.

Figure 62. Measure 11 Type 1 and Other Age 0-17 by NHS Board

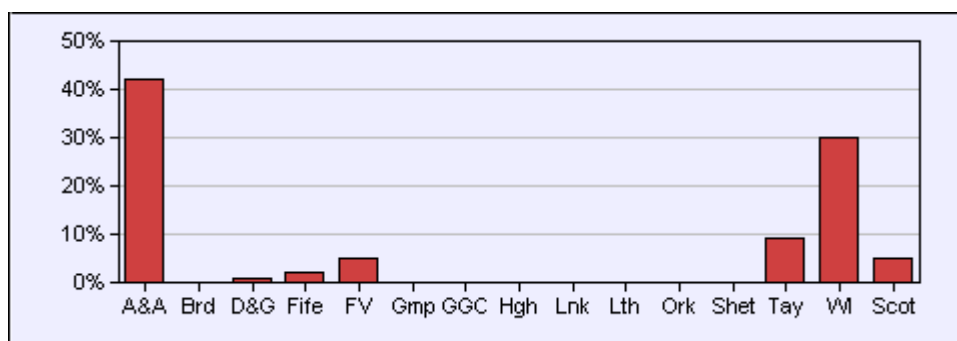


Figure 63. Measure 11 Type 1 Age 18+ by NHS Board

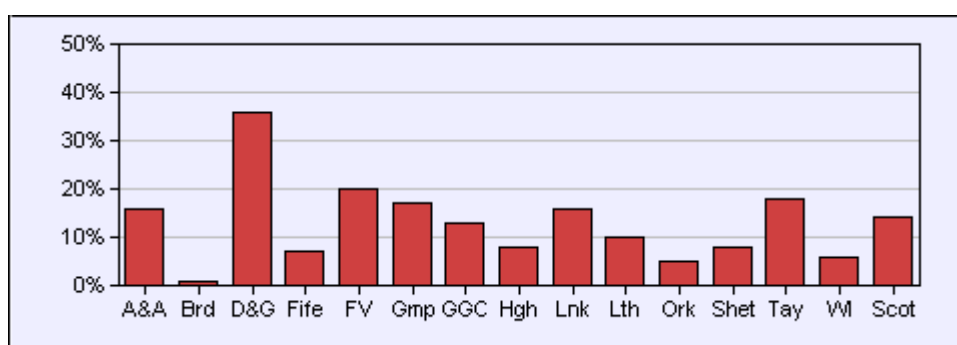
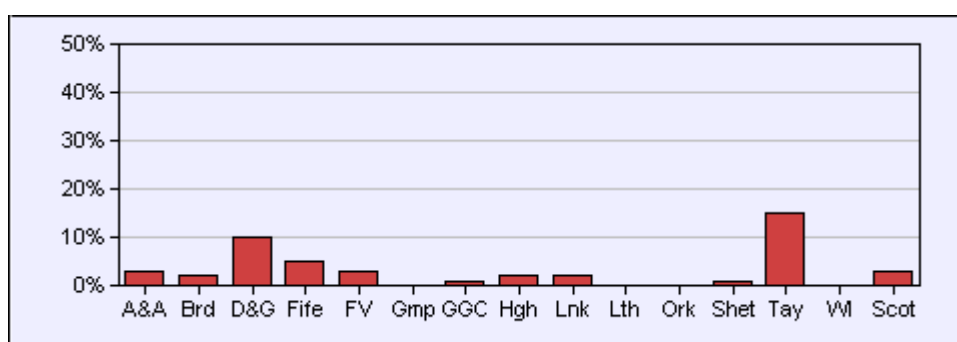


Figure 64. Measure 11 Type 2 and Other Age 18+ by NHS Board



Measure 12

Percentage of people with diabetes who are disengaged from diabetes care, i.e. no HbA1c and no retinal screening in the preceding 15 months - presented in defined age ranges.

Methodology

Included population = patients with diabetes aged 12 or over who have a duration of diabetes ≥ 1 year are included.

Numerator = the total number of patients in each age/type cohort who have no record of HbA1c and no record of retinal screening in the prior 15 months.

Denominator = the total number of patients in each age/type cohort who have a duration of diabetes ≥ 1 year

Notes

Patients currently suspended from eye-screening or who are under the care of Ophthalmology are considered to be "engaged" with service.

Figure 65. Measure 12 Type 1 and Other Age 12-17 by NHS Board

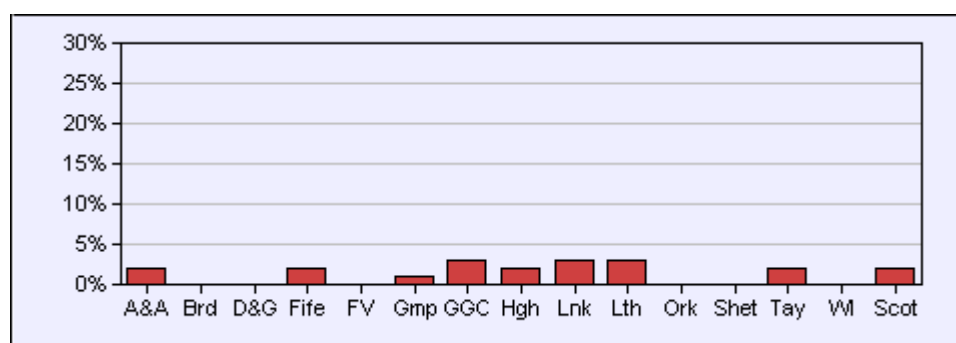


Figure 66. Measure 12 Type 1 Age 18-26 by NHS Board

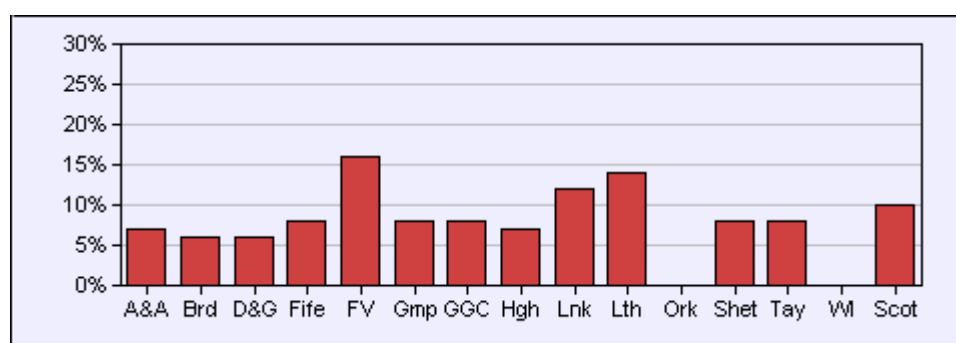


Figure 67. Measure 12 Type 1 Age 26+ by NHS Board

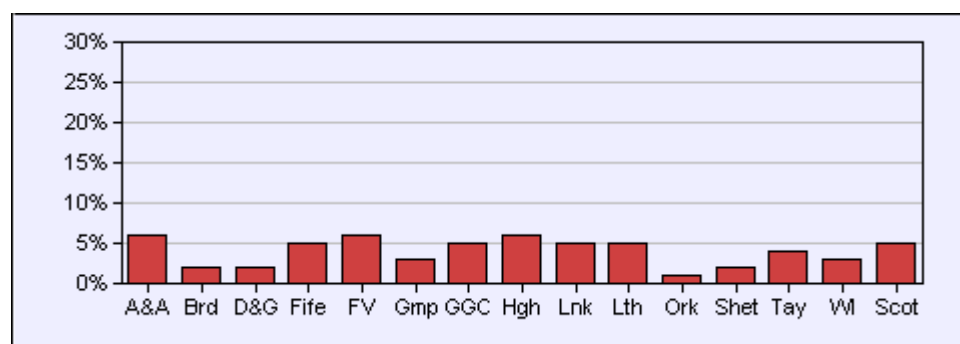


Figure 68. Measure 12 Type 2 and Other Age 18-25 by NHS Board

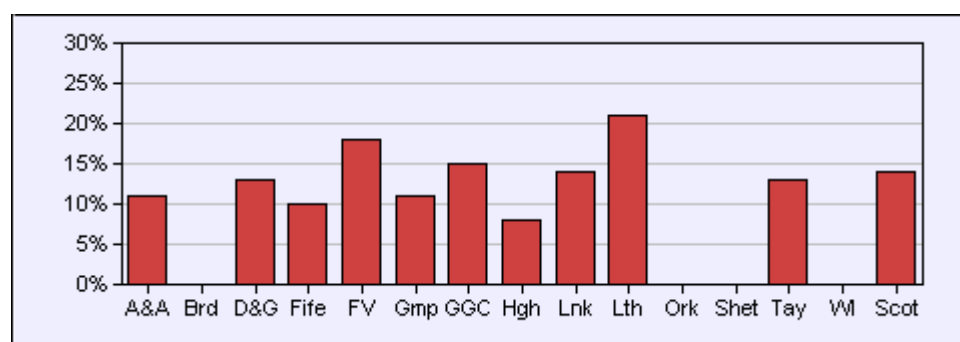
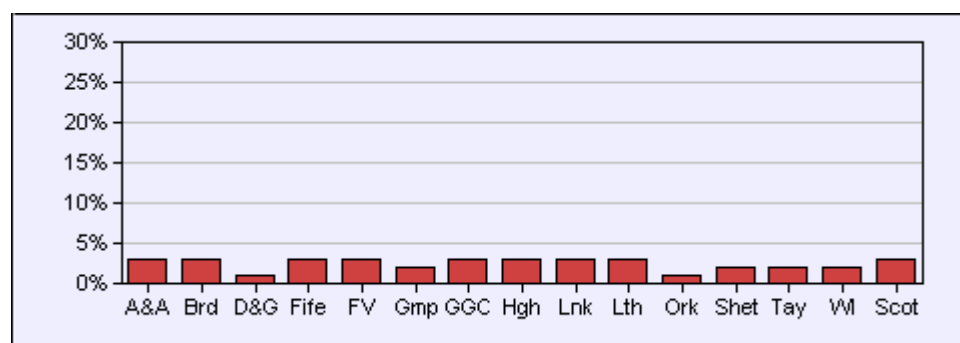


Figure 69. Measure 12 Type 2 and Other Age 26+ by NHS Board



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- Prof John McKnight (Chair)
- Dr Louise Bath
- Mr Mike Black
- Mr Michael Bluett
- Prof Helen Colhoun
- Dr Scott Cunningham
- Dr Fraser Gibb
- Dr Brian Kennon
- Dr Sam Philip
- Dr Stuart Ritchie
- Dr Kenneth J Robertson
- Dr William Simpson
- Diane Smith
- Prof Sarah Wild
- Dr Nicola Zammitt

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Figure 53. Measure 7 Type 2 and Other Age 18+ by NHS Board

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Figure 55. Measure 8 Type 1 Age 18+ by NHS Board

Figure 56. Measure 8 Type 2 and Other Age 18+ by NHS Board

Figure 57. Measure 9 Type 1 Age 0-17 by NHS Board

Figure 58. Measure 9 Type 1 Age 18+ by NHS Board

Figure 59. Measure 10 Type 1 and Other Age 0-17 by NHS Board

Figure 60. Measure 10 Type 1 Age 18+ by NHS Board

Figure 61. Measure 10 Type 2 and Other Age 18+ by NHS Board

Figure 62. Measure 11 Type 1 and Other Age 0-17 by NHS Board

Figure 63. Measure 11 Type 1 Age 18+ by NHS Board

Figure 64. Measure 11 Type 2 and Other Age 18+ by NHS Board

Figure 65. Measure 12 Type 1 and Other Age 12-17 by NHS Board

Figure 66. Measure 12 Type 1 Age 18-26 by NHS Board

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Figure 69. Measure 12 Type 2 and Other Age 26+ by NHS Board

Appendix 1: SCI-Diabetes Data Sources

SCI-Diabetes is NHS Scotland's diabetes patient management system. It is used in all fourteen health boards and holds data on all people with diabetes living in Scotland. Its purpose is to ensure that patients receive the best possible care for their diabetes by providing authorised members of the healthcare team with the information they require to effectively manage their patients.

Security and Confidentiality

SCI-Diabetes is available to members of the NHS Scotland healthcare team within the confines of the NHS intranet. SCI-Diabetes can only be accessed via a secure connection and data are never shared with any unauthorised third-parties. Diabetes Managed Clinical Networks have been set up in all NHS Scotland health boards and they have the responsibility for managing access to SCI-Diabetes.

Data Sources

SCI-Diabetes is used directly by many professionals, but it also receives data from a variety of data sources in order to maintain its shared electronic record for diabetes. A breakdown of the main sources at February 2017 is as follows:

- Community Health Index (master patient index)
- All ~1,000 general practices across Scotland (EMIS, Vision)
- 42 hospitals (direct data entry on SCI-Diabetes)
- 13/14 NHS boards linking to local laboratory data (SCI Store – see below)
- National Diabetic Retinopathy Screening (DRS) System (Soarian – migrating to Vector in March 2017)
- Inpatient Management: 5 NHS boards linking to local patient administration system for admission, discharge and transfer data (TOPAS, TrakCare)
- Connected Ward Meters: 1 NHS board linking ward-based blood glucose measurements. Priority implementation area for national diabetes inpatient management programme

Registration onto the system can be initiated via the primary and secondary care feeds, registration onto the DRS system or web patient administration forms. As part of the DRS registration process, primary care users are expected to review their SCI-Diabetes lists periodically to ensure that all patients eligible for screening are held.

The current SCI-Store (laboratory data) and Inpatient Management Implementation matrices are shown below.

Table 78. Progress towards links from SCI Store to SCI-Diabetes.

NHS Board	Implementation Requested	Status	Comments
Ayrshire and Arran	Yes	Live	
Borders	Yes	Live	
Dumfries and Galloway	Yes	Live	
Fife	Yes	Live	
Fife/Tayside	Yes	Live	
Forth Valley	Yes	Live	
Grampian	Yes	Live	
Greater Glasgow and Clyde	Yes	Live	
Highland	Yes	Not scheduled	Argyll & Bute data obtained from GG&C SCI-Store. Awaiting Highland SCI-Store upgrade
Lanarkshire	Yes	Live	
Lothian	Yes	Live	
Orkney	Yes	Live	
Shetland	Yes	Live	
Tayside	Yes	Live	
Western Isles	Yes	Live	

Table 79. Progress towards links from Patient Administration Systems to SCI-Diabetes.

NHS Board	Implementation Requested	Status	Comments
Ayrshire and Arran	Yes	In test	TrakCare
Borders	Yes	Not scheduled	TrakCare
Dumfries and Galloway	Yes	Not scheduled	TOPAS
Fife	Yes	Live	eOasis/Tiara – migrating to TrakCare 2017
Forth Valley	No	Not scheduled	eWard
Grampian	Yes	Live	TrakCare
Greater Glasgow and Clyde	Yes	Scheduled	TrakCare
Highland	Yes	Live	TrakCare
Lanarkshire	Yes	Live	TrakCare
Lothian	Yes	Awaiting upgrade	TrakCare
Orkney	No	Not scheduled	
Shetland	No	Not scheduled	
Tayside	Yes	Live	TOPAS – migrating to TrakCare 2017
Western Isles	No	Not scheduled	Cortix

SCI-Diabetes is supporting a national Healthcare Improvement Programme focusing on inpatient diabetes. To provide accurate reporting it is essential that SCI-Diabetes receives data from all hospital patient administration systems and, where relevant, connected ward-based blood glucose meters from systems supplied by Roche and Abbott. At present, NHS Tayside is the only area providing full support for diabetes inpatient management.

In addition to incoming feeds, SCI-Diabetes data are also transferred to external systems:

- National Diabetic Retinopathy Screening: to maintain the call-recall system
- My Diabetes My Way: patients accessing their own information
- SCI-Diabetes Audit Server: for regional and national reporting
- Back-Population of over 95% of GP systems: in support of a single-point of data entry

The SCI-Diabetes team are currently addressing several strategic objectives, of which will begin implementation in 2017. These include the enhanced management and collaborations with:

- Scottish Ambulance Service (due mid-2017)
- WinScribe: supporting letter management
- Electronic Document Transfer Systems: supporting paperless working
- Clinical Portals: allowing access to diabetes data for wider clinical teams

More information about the SCI-DC programme and SCI-Diabetes is available at <http://www.sci-diabetes.scot.nhs.uk/>

Appendix 2: Comparison with England/Wales

This section provides a comparison of the results of this survey with the 2015-16 National Diabetes Audit (NDA) in England and Wales¹. Please note that the definitions and cut-off values for blood pressure are not exactly the same so the figures may not be directly comparable.

1 2015-2016 National Diabetes Audit for England and Wales is available from <http://www.content.digital.nhs.uk/catalogue/PUB23241>

Diabetes Prevalence

The 2016 Scottish Diabetes Survey (Table 1) reports that 5.4% of the whole population had diabetes (291,981 people), compared to 6.4% (approximately 2.7 million people) identified from 82% of general practices and specialist services in England and Wales that participated in the NDA).

Table 80. Comparison of distribution of key risk factors between Scotland and England/Wales (E&W) by type of diabetes.

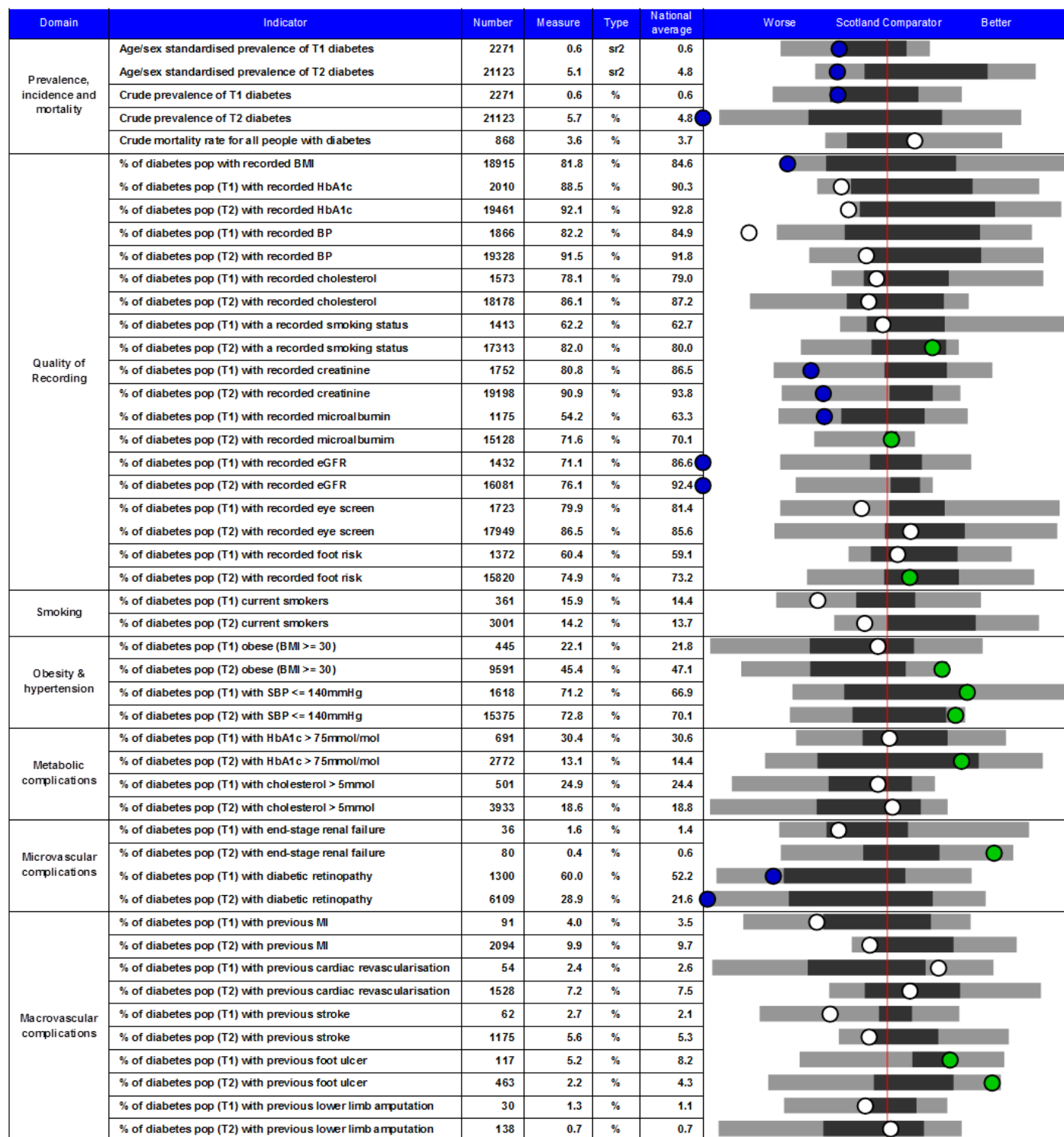
Risk Factor	Range	Type 1		Type 2	
		Scotland (%)	E&W (%)	Scotland (%)	E&W (%)
HbA1c	< 58mmol/mol	23.4		61.4	
	≤ 58mmol/mol		29.2		65.7
BP	<130/80 mmHg	45.0		32.7	
	≤140/80 mmHg		74.2		73.6
Cholesterol	≤ 5 mmol/l	69.1		78.4	
	< 5 mmol/l		70.8		77.1

Appendix 3: Variability of HbA1c

In Scotland laboratory services are provided by 14 separately funded Health Boards from multiple sites. A range of technologies are used in those various sites, including ion exchange, affinity chromatography and immunoassay, and historically these assays had not shown good agreement, even after 2011 when all systems were calibrated against IFCC standards,. This could give the appearance of significant differences in glycaemic control between boards. Considerable effort has been made across Scotland, in collaboration with technology companies, to reduce these discrepancies, and during the course of 2015 methods-specific bias (consistent deviation from all-method mean values) observed in the UK National External Quality Assurance Scheme (NEQAS) improved considerably, and although 2015 data will still be influenced, data from 2016 onwards should be broadly comparable across Scottish laboratories

Appendix 4: Health Board Performance

Diabetes Health Board Spine Chart (Ayrshire and Arran) 2016

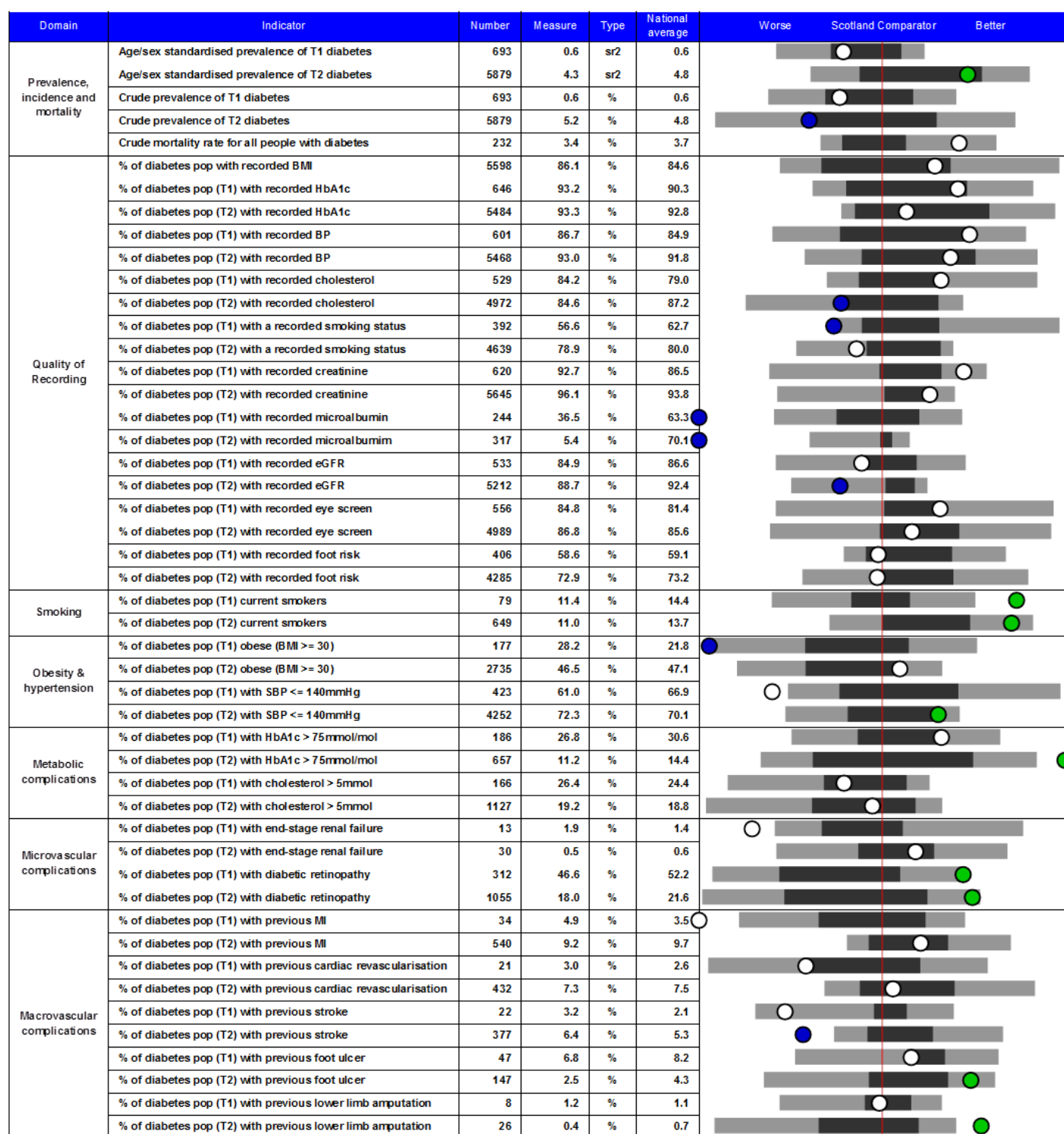


Spine chart key: % percent
sr2=age-sex standardised rate per 100 population

Spine chart key: ● Statistically significantly 'worse' than National average
○ Statistically not significantly different from National average
● Statistically significantly 'better' than National average

'Worse' Area ← Scotland Average → 'Better' Area
5th percentile 25th percentile 75th percentile 95th percentile

Diabetes Health Board Spine Chart (Borders) 2016

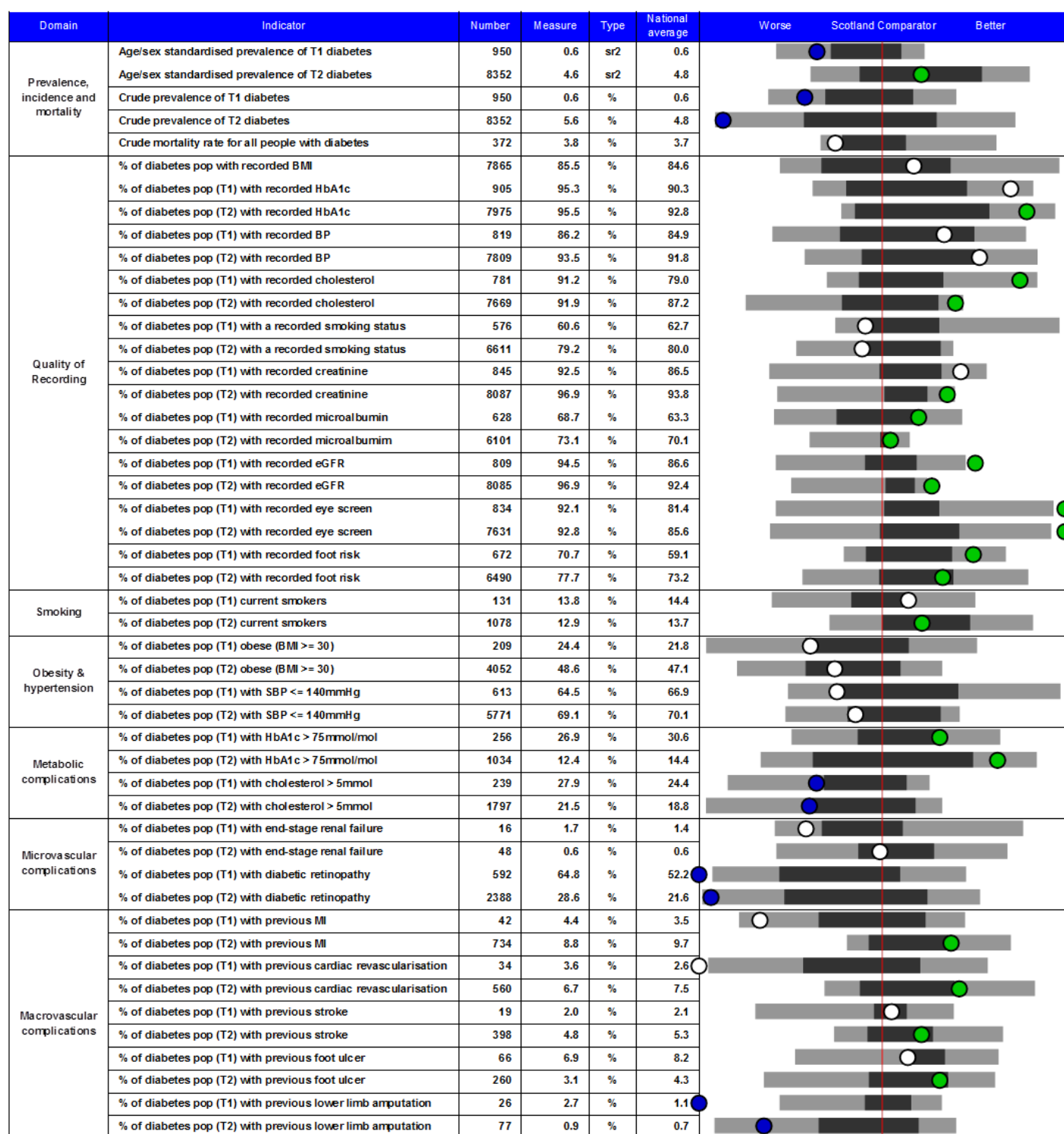


Spine chart key: % percent
sr2=age-sex standardised rate per 100 population

Spine chart key: ● Statistically significantly 'worse' than National average
○ Statistically not significantly different from National average
● Statistically significantly 'better' than National average

'Worse' Area ← Scotland Average → 'Better' Area
5th percentile 25th percentile 75th percentile 95th percentile

Diabetes Health Board Spine Chart (Dumfries and Galloway) 2016

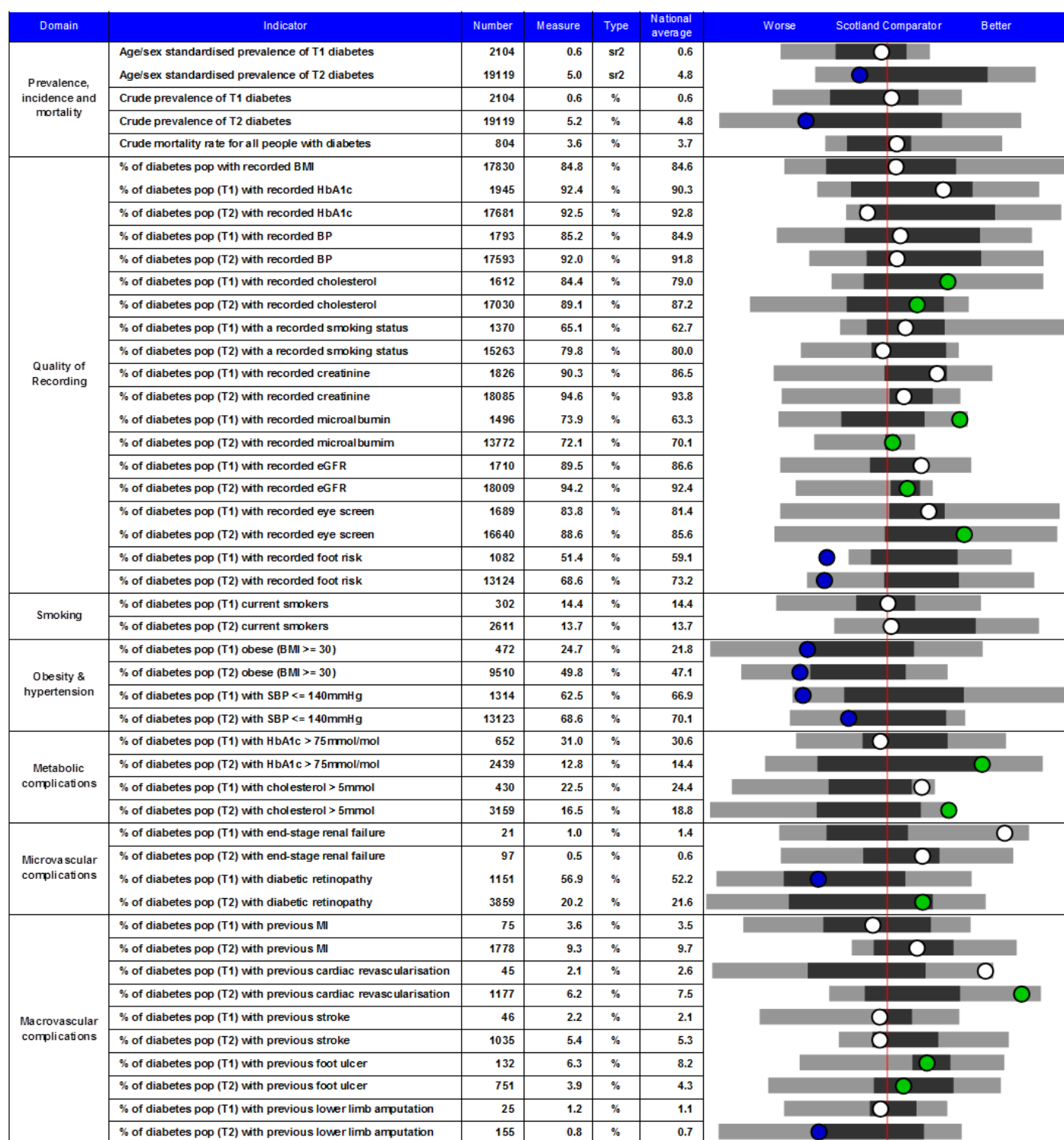


Spine chart key: % percent
sr2=age-sex standardised rate per 100 population

Spine chart key: ● Statistically significantly 'worse' than National average
○ Statistically not significantly different from National average
● Statistically significantly 'better' than National average

'Worse' Area ← Scotland Average → 'Better' Area
5th percentile 25th percentile 75th percentile 95th percentile

Diabetes Health Board Spine Chart (Fife) 2016

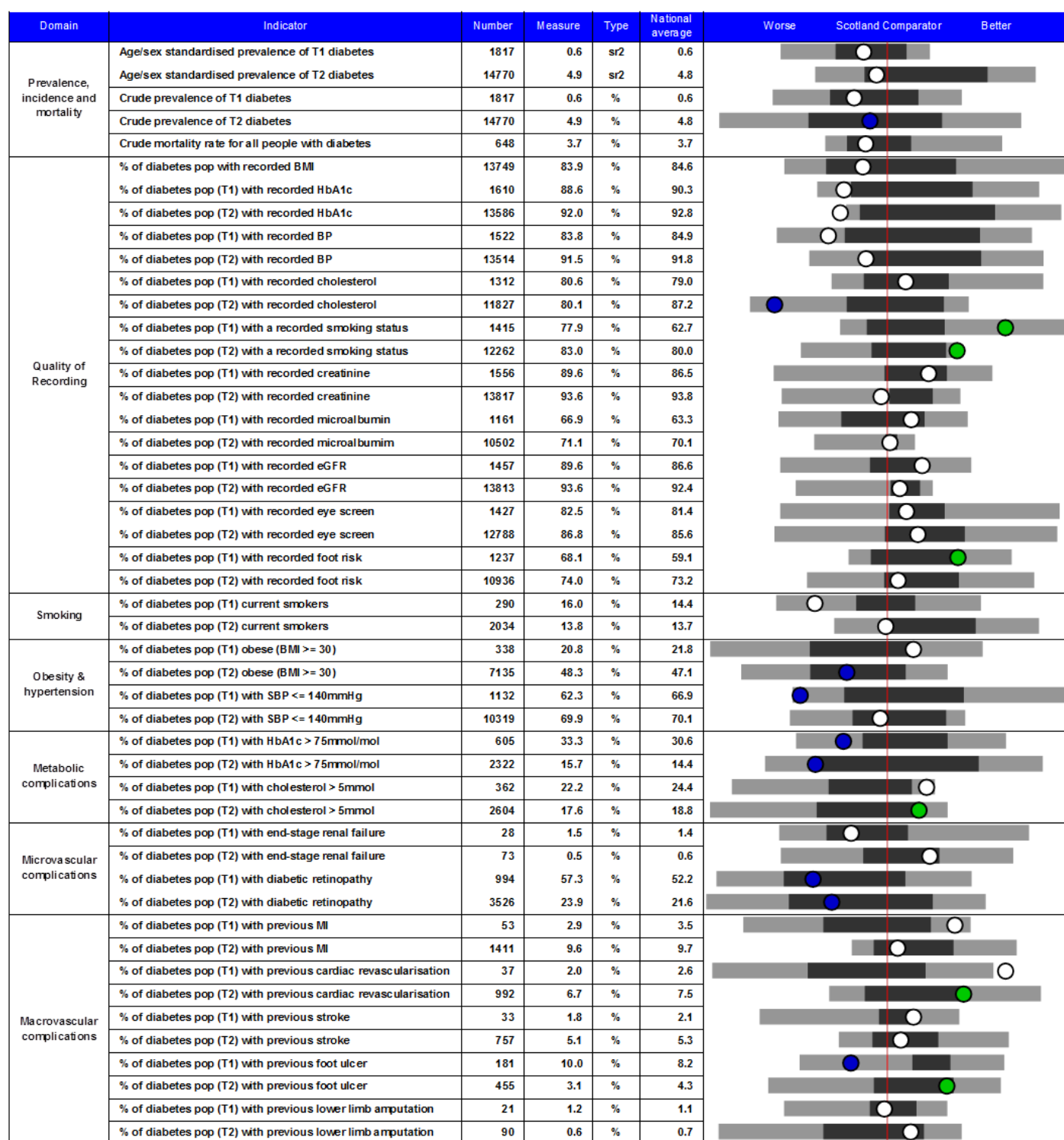


Spine chart key: % percent
sr2=age-sex standardised rate per 100 population

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○ Statistically not significantly different from National average
● Statistically significantly 'better' than National average

'Worse' Area ← Scotland Average → 'Better' Area
5th percentile 25th percentile 75th percentile 95th percentile

Diabetes Health Board Spine Chart (Forth Valley) 2016

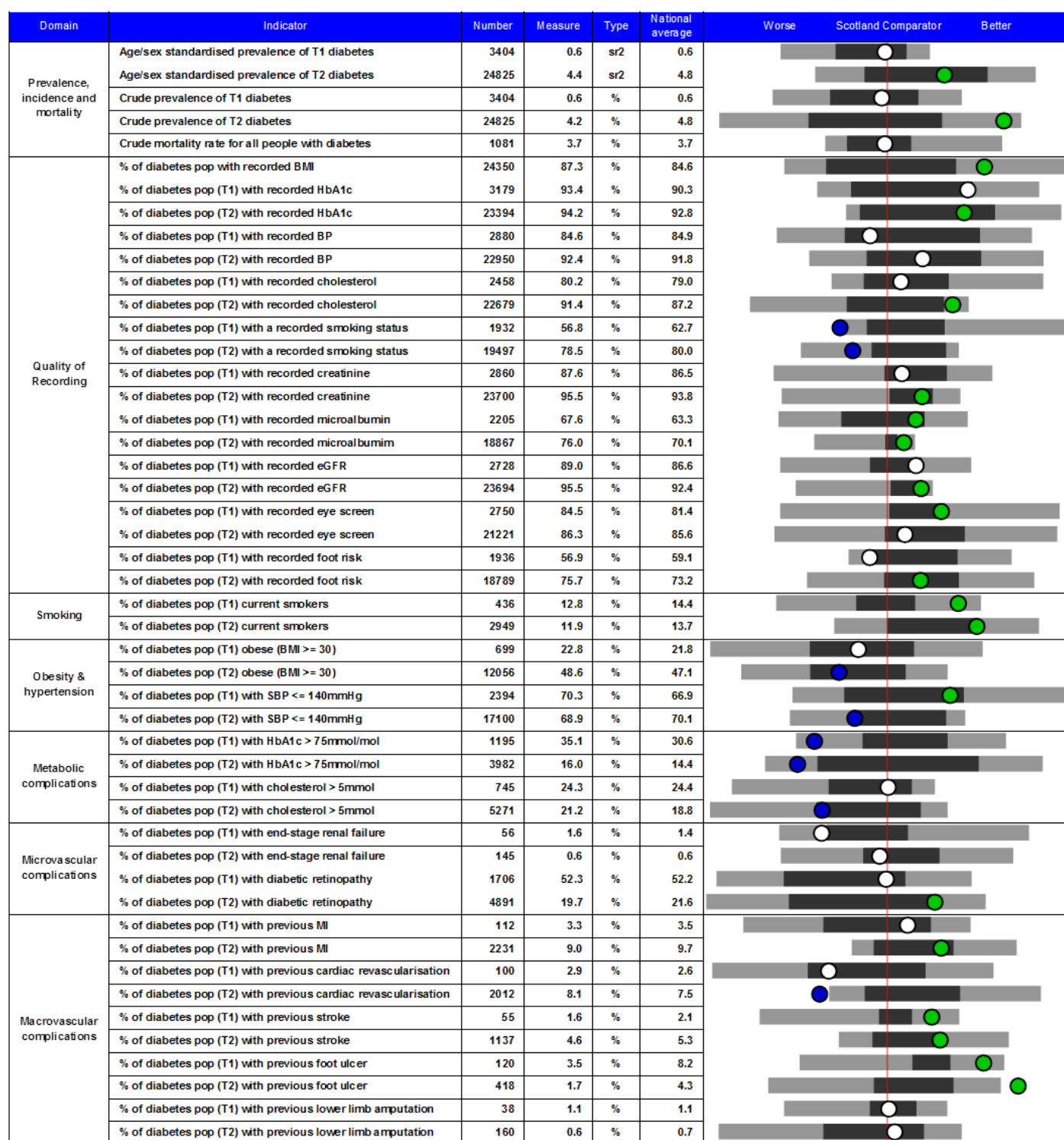


Spine chart key: % percent
sr2=age-sex standardised rate per 100 population

Spine chart key: ● Statistically significantly 'worse' than National average
○ Statistically not significantly different from National average
● Statistically significantly 'better' than National average

'Worse' Area ← Scotland Average → 'Better' Area
5th percentile 25th percentile 75th percentile 95th percentile

Diabetes Health Board Spine Chart (Grampian) 2016

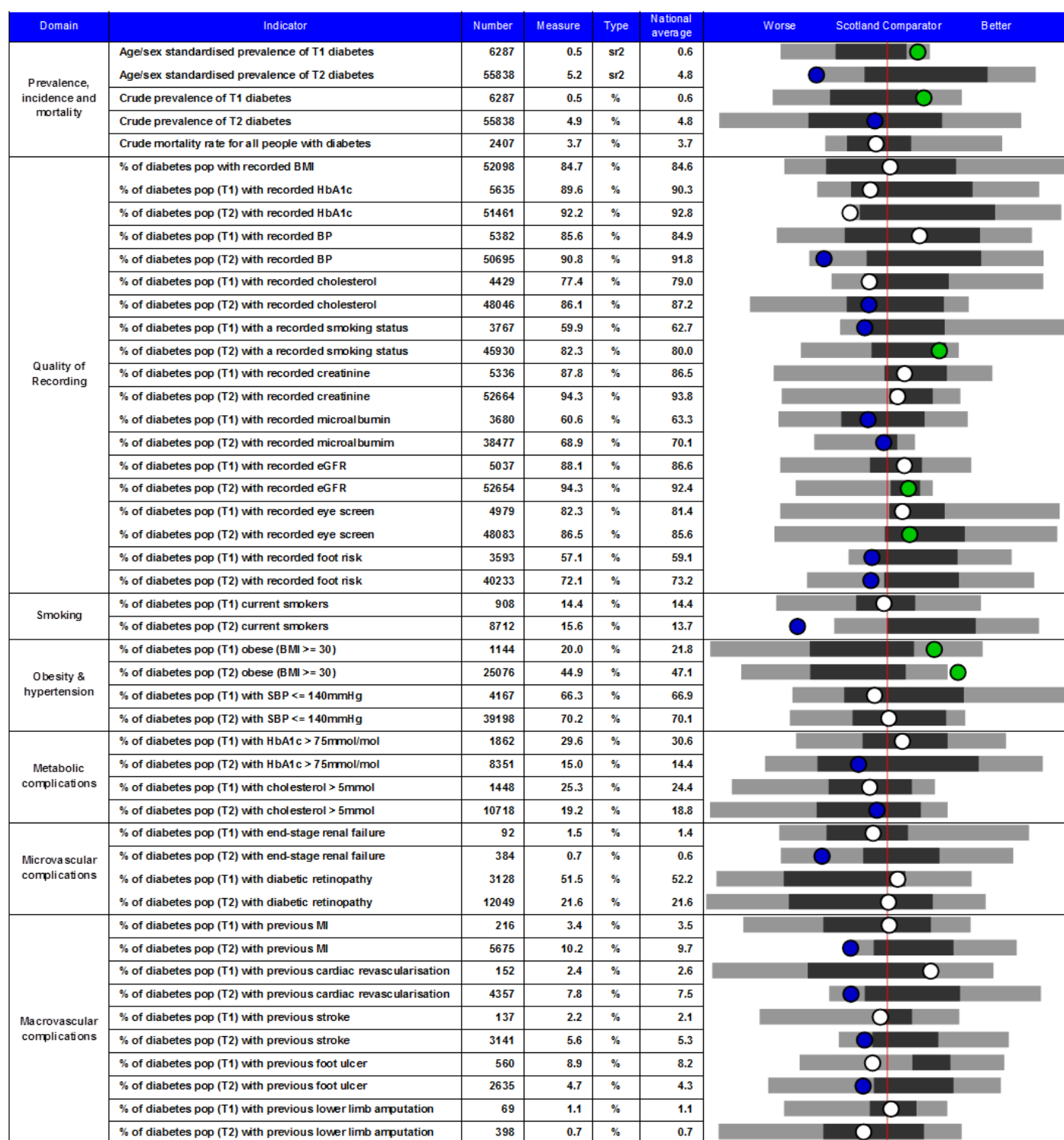


Spine chart key: % percent
sr2=age-sex standardised rate per 100 population

Spine chart key: ● Statistically significantly 'worse' than National average
○ Statistically not significantly different from National average
● Statistically significantly 'better' than National average

'Worse' Area ← Scotland Average → 'Better' Area
5th percentile 25th percentile 75th percentile 95th percentile

Diabetes Health Board Spine Chart (Greater Glasgow and Clyde) 2016

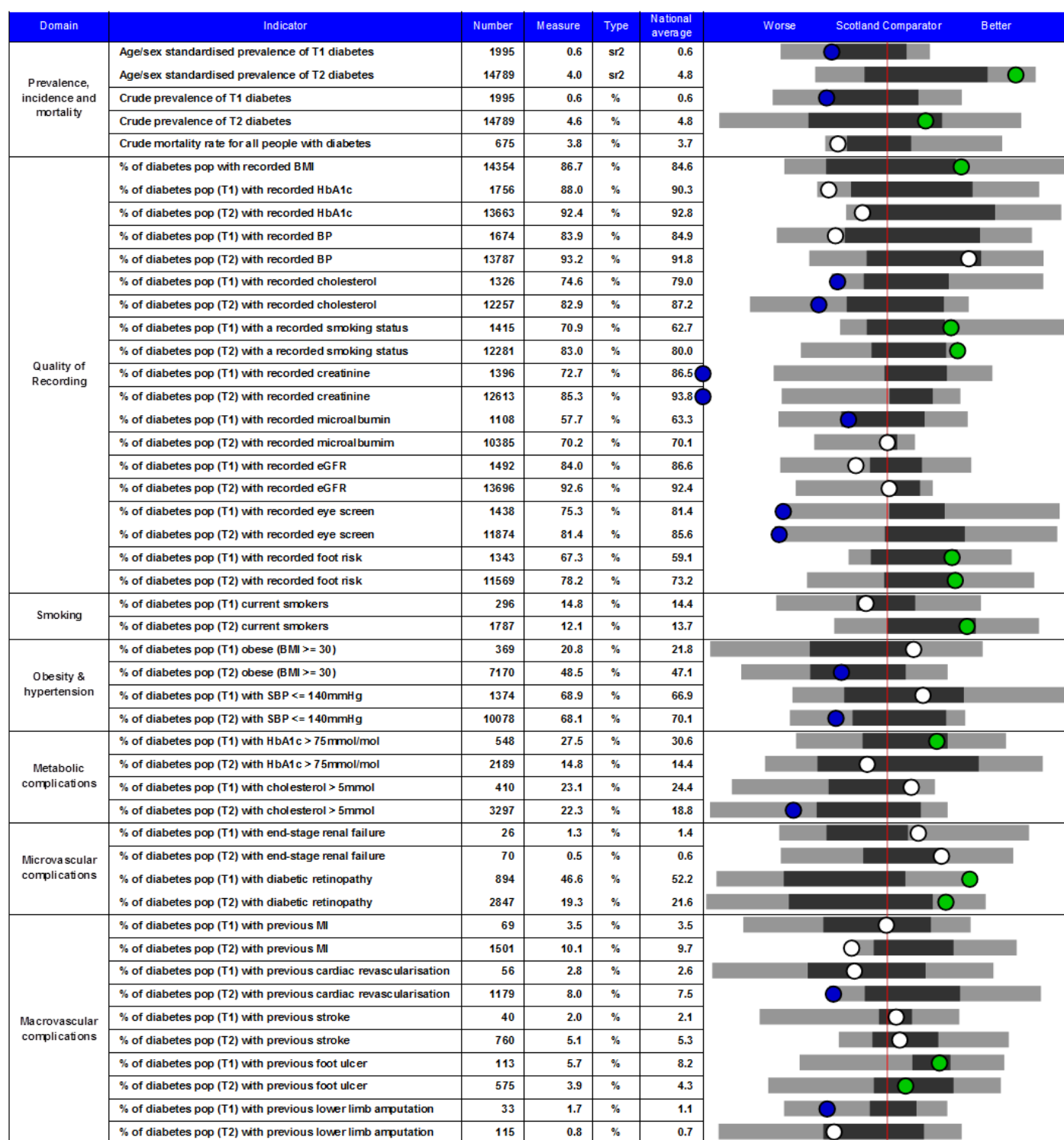


Spine chart key: % percent
sr2=age-sex standardised rate per 100 population

Spine chart key:
● Statistically significantly 'worse' than National average
○ Statistically not significantly different from National average
● Statistically significantly 'better' than National average

'Worse' Area ← Scotland Average → 'Better' Area
5th percentile 25th percentile 75th percentile 95th percentile

Diabetes Health Board Spine Chart (Highland) 2016

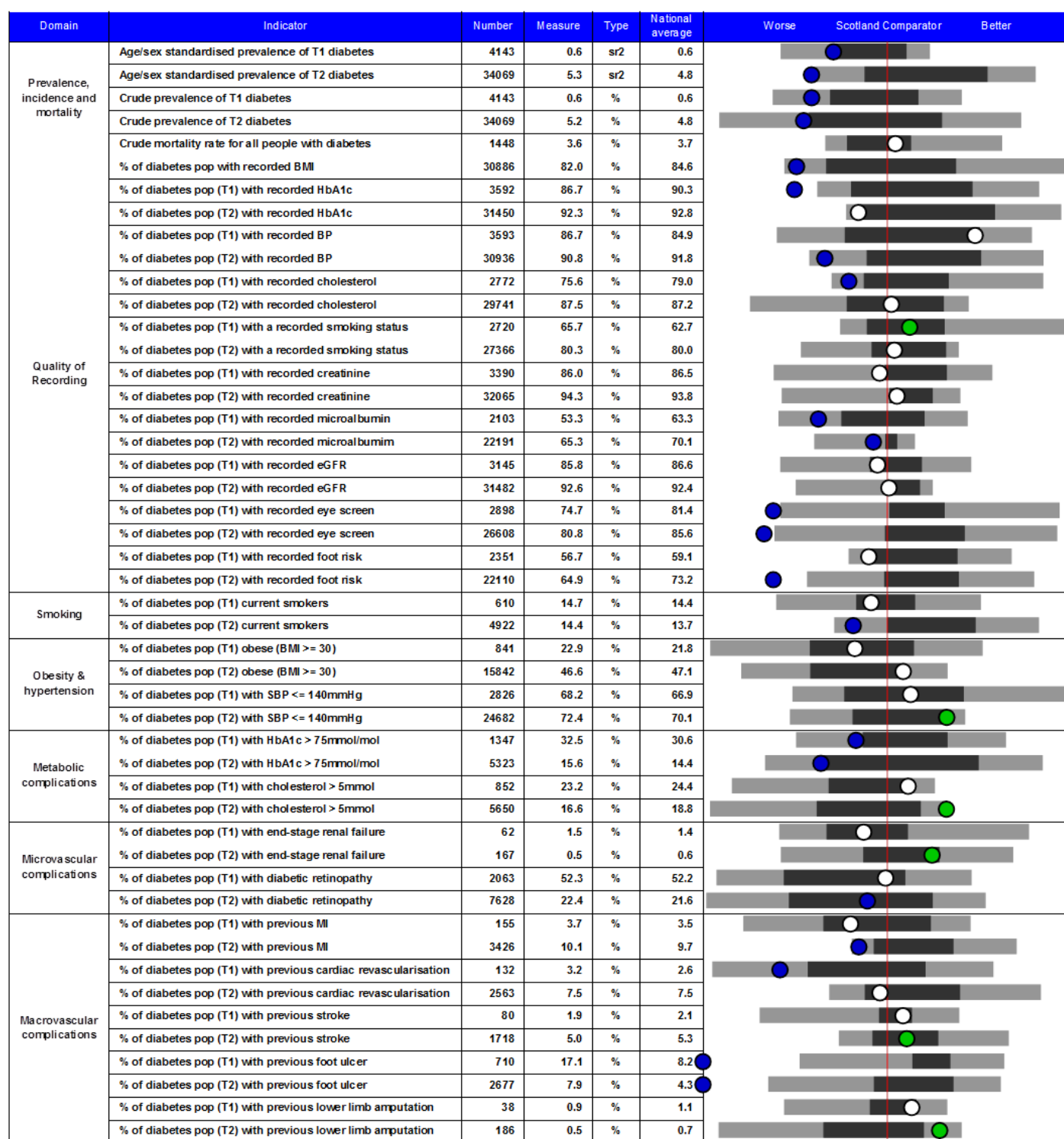


Spine chart key: % percent
sr2=age-sex standardised rate per 100 population

Spine chart key: ● Statistically significantly 'worse' than National average
○ Statistically not significantly different from National average
● Statistically significantly 'better' than National average

'Worse' Area ← Scotland Average → 'Better' Area
5th percentile 25th percentile 75th percentile 95th percentile

Diabetes Health Board Spine Chart (Lanarkshire) 2016

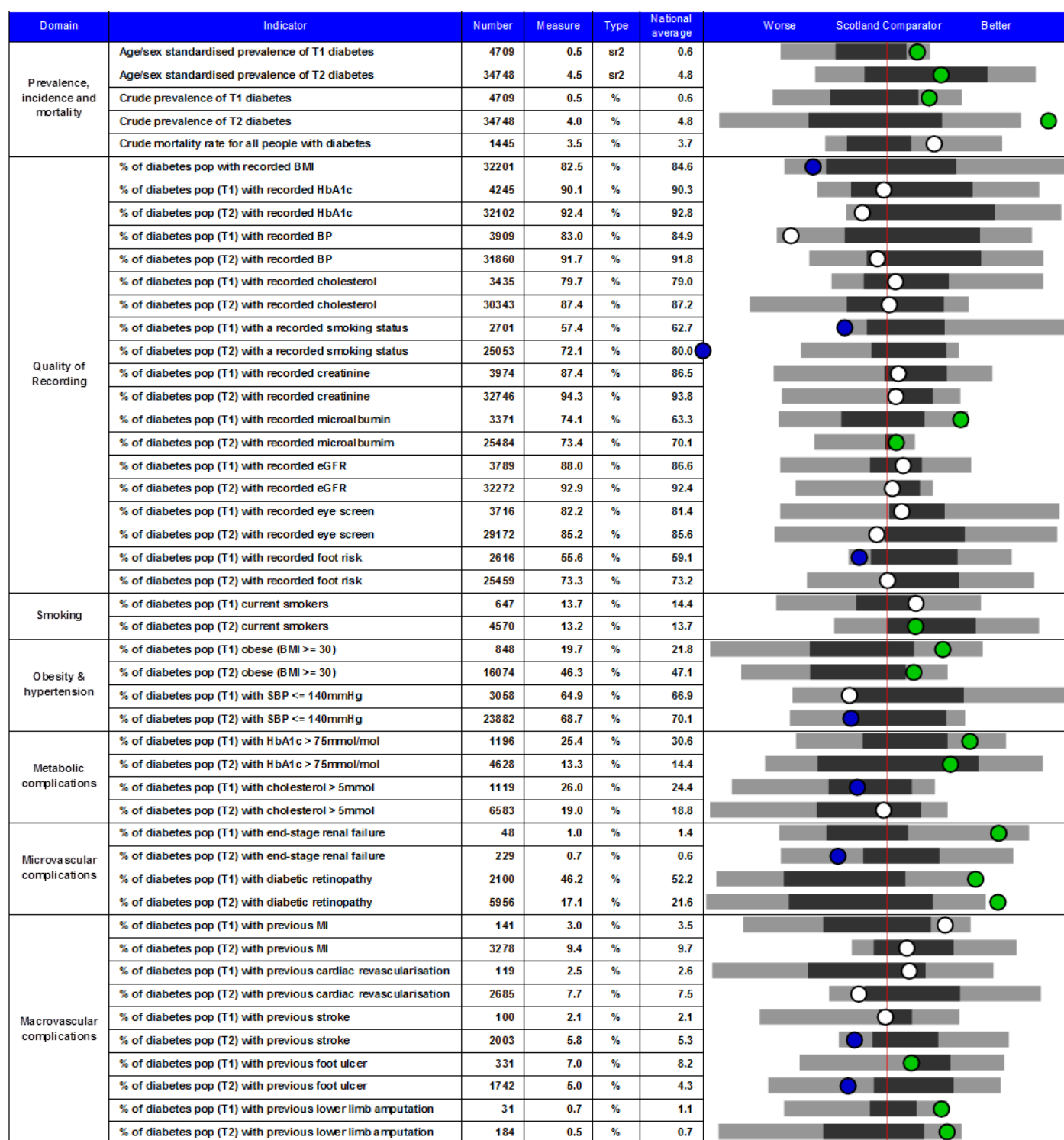


Spine chart key: % percent
sr2=age-sex standardised rate per 100 population

Spine chart key: ● Statistically significantly 'worse' than National average
○ Statistically not significantly different from National average
● Statistically significantly 'better' than National average

'Worse' Area ← Scotland Average → 'Better' Area
5th percentile 25th percentile 75th percentile 95th percentile

Diabetes Health Board Spine Chart (Lothian) 2016

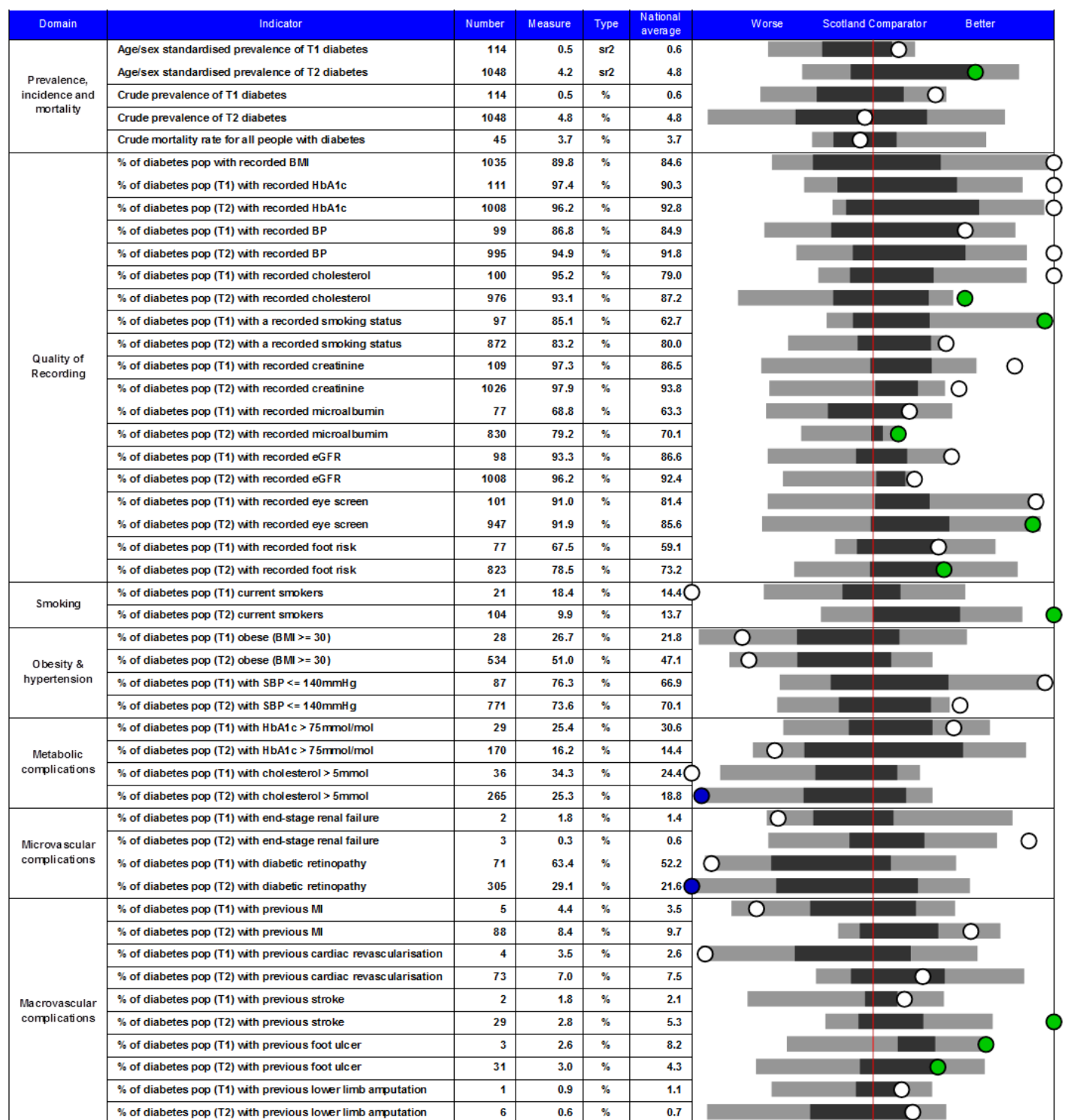


Spine chart key: % percent
sr2=age-sex standardised rate per 100 population

Spine chart key: ● Statistically significantly 'worse' than National average
○ Statistically not significantly different from National average
● Statistically significantly 'better' than National average

'Worse' Area ← Scotland Average → 'Better' Area
5th percentile 25th percentile 75th percentile 95th percentile

Diabetes Health Board Spine Chart (Orkney) 2016

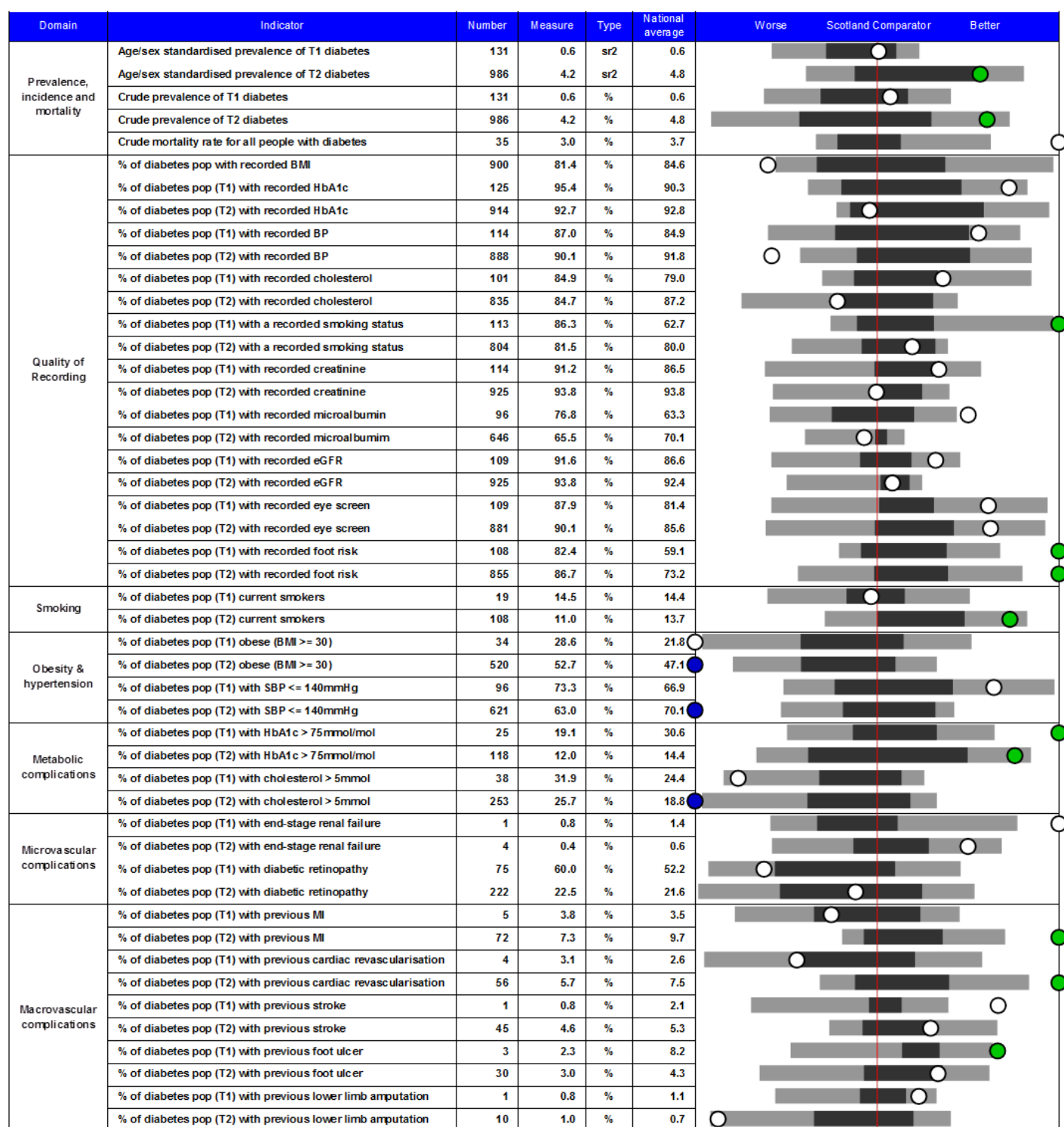


Spine chart key: % percent
sr2=age-sex standardised rate per 100 population

Spine chart key: ● Statistically significantly 'worse' than National average
○ Statistically not significantly different from National average
● Statistically significantly 'better' than National average

'Worse' Area ← Scotland Average → 'Better' Area
5th percentile 25th percentile 75th percentile 95th percentile

Diabetes Health Board Spine Chart (Shetland) 2016

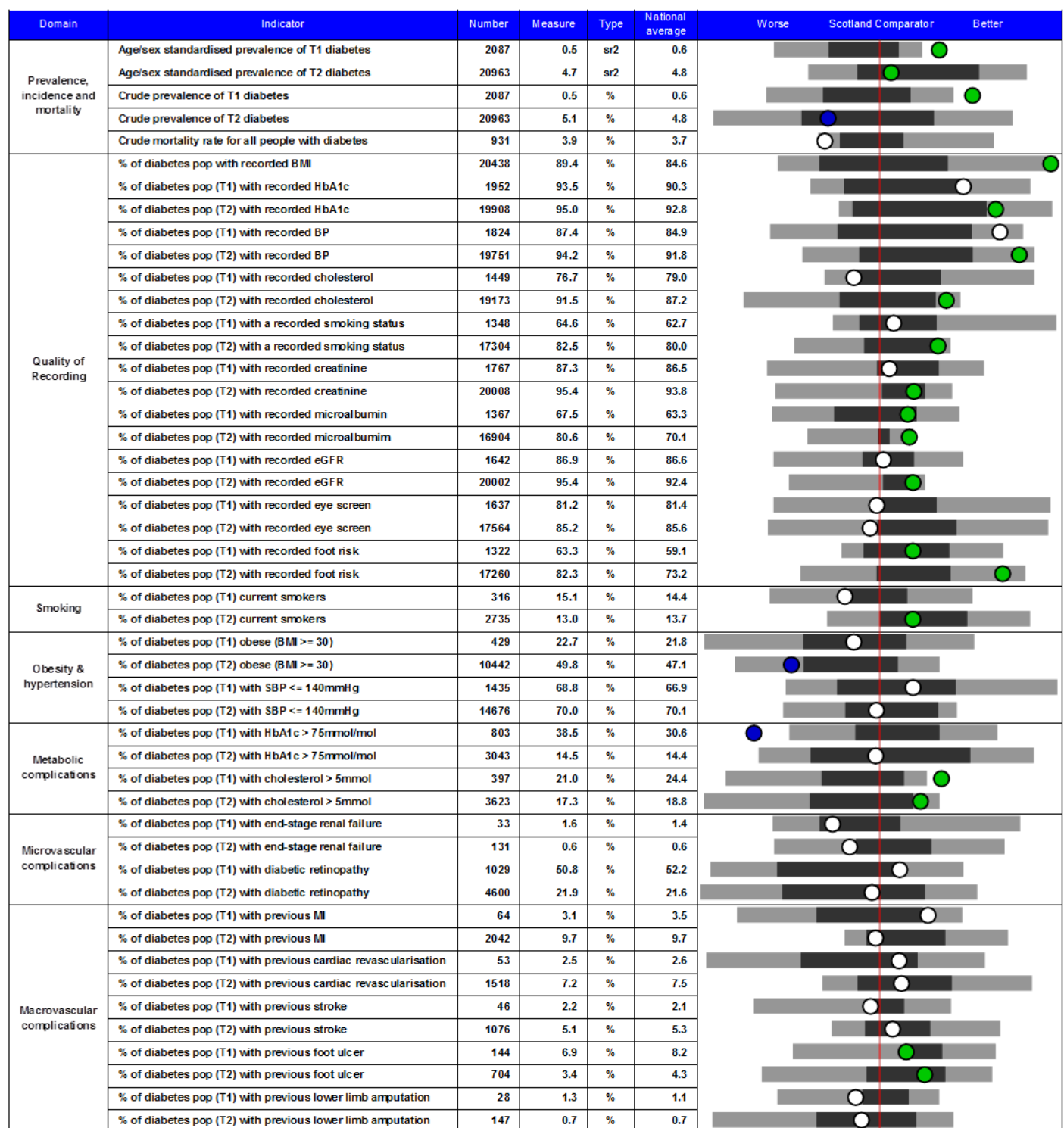


Spine chart key: % percent
sr2=age-sex standardised rate per 100 population

Spine chart key: ● Statistically significantly 'worse' than National average
○ Statistically not significantly different from National average
● Statistically significantly 'better' than National average

'Worse' Area ← Scotland Average → 'Better' Area
5th percentile 25th percentile 75th percentile 95th percentile

Diabetes Health Board Spine Chart (Tayside) 2016

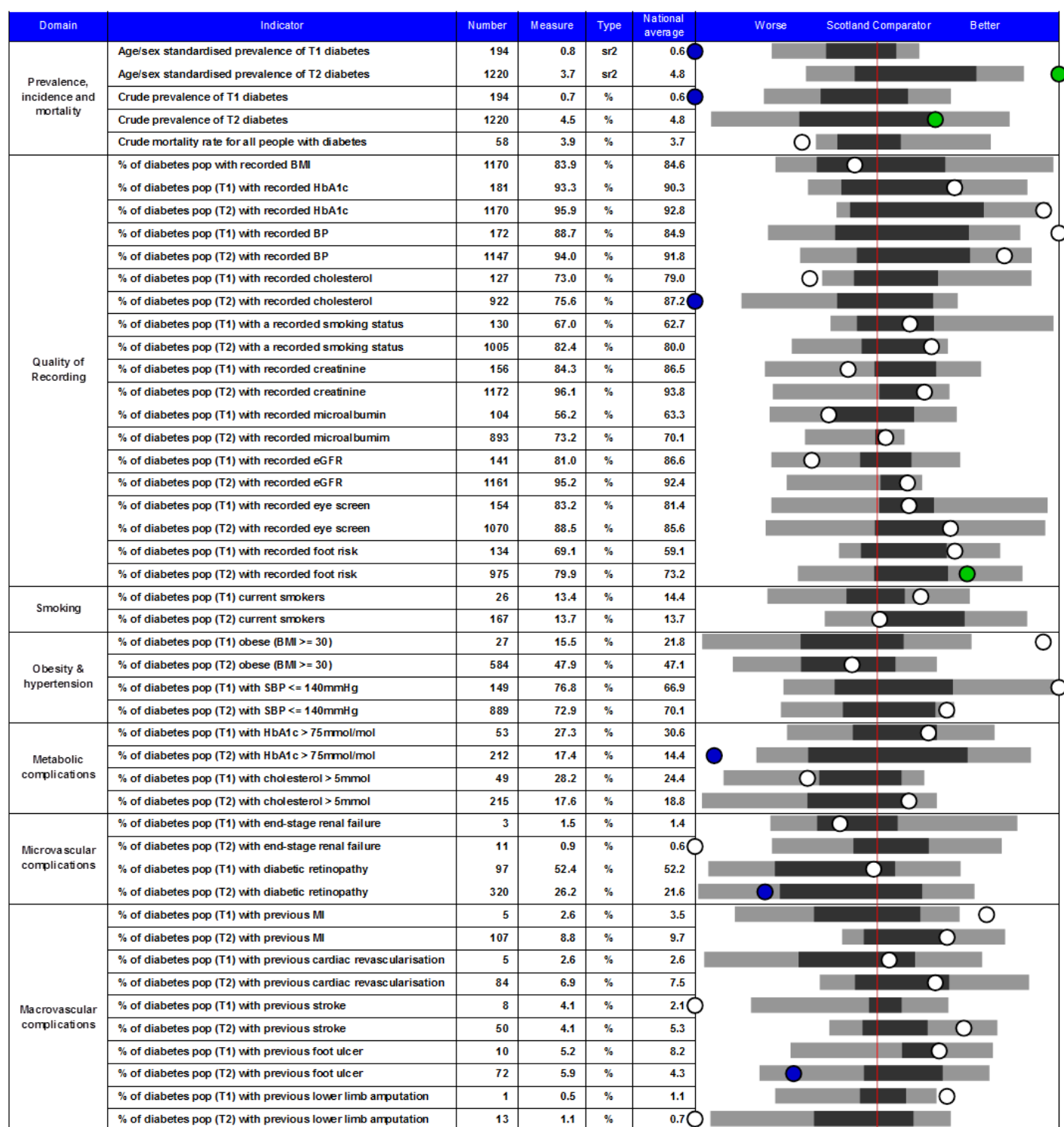


Spine chart key: % percent
sr2=age-sex standardised rate per 100 population

Spine chart key: ● Statistically significantly 'worse' than National average
○ Statistically not significantly different from National average
● Statistically significantly 'better' than National average

'Worse' Area ← Scotland Average → 'Better' Area
5th percentile 25th percentile 75th percentile 95th percentile

Diabetes Health Board Spine Chart (Western Isles) 2016



Spine chart key: % percent
sr2=age-sex standardised rate per 100 population

Spine chart key: ● Statistically significantly 'worse' than National average
○ Statistically not significantly different from National average
● Statistically significantly 'better' than National average

'Worse' Area ← Scotland Average → 'Better' Area
5th percentile 25th percentile 75th percentile 95th percentile