X-PERT National Audit Results 2018

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Introduction

People with diabetes spend only **three hours** a year with a healthcare professional on average. For the remaining **8,757 hours** they manage their diabetes themselves. Managing diabetes well is challenging and demands constant commitment. People need to have the skills and confidence to manage their condition throughout their lives. Yet few people are offered high quality education courses in a persuasive way due to myths that diabetes education does not really work, is never going to be attended by many people and is expensive. In fact, the current lack of diabetes education is leading to:

- unnecessary serious complications such as heart disease, stroke and blindness
- fewer people with diabetes being in control of their health – seriously affecting their quality of life and engagement with their care.

A radical improvement in diabetes education for adults is achievable and will provide very high value healthcare or even save the NHS money (Diabetes UK 2015).

X-PERT Diabetes is a structured education/self-management programme that meets the key criteria (DH/Diabetes UK 2006) to implement NICE Guidance (NICE 2008). It has been shown to be effective in improving health and quality of life outcomes in people with newly diagnosed and in people with existing diabetes both in a randomised controlled trial (RCT) and in routine national implementation (Deakin *et al,* 2006 & 2011). The cost effectiveness of diabetes self-management programmes has been investigated and X-PERT was shown to be the most cost effective programme with 1 quality-adjusted life-year (QALY) gained costing less than €20,000 (Jacobs-Van Der Bruggen, 2009). The 2011 X-PERT Audit of 16,031 participants demonstrated that national implementation of the X-PERT Diabetes Programme could result in a cost saving to the NHS of £367 million per annum (Deakin 2011).

Audit of the programme is one of the key criteria in the implementation of structured diabetes education. The X-PERT audit database was developed so that organisations can audit X-PERT implementation against standards and national targets and compare their effectiveness to the *all centres* mean and RCT results. It is crucial to assess whether implementation of the X-PERT Programme results in the improvement to health and wellbeing that was seen in the published clinical trial.

NHS Reforms have resulted in many merges and it is a time of change. There were 67 organisations registered on the national X-PERT audit database for 2016-2017. Fifty-eight of these organisations (86.5%) entered sufficient data to be included in the 2018 national audit report. Implementation of the X-PERT Programme enables organisations to meet the objectives of the NHS Outcomes Framework and the NICE Quality Standard for adults with diabetes; especially structured education (standard 1), nutrition and physical activity (standard 2) and care planning (standard 3) in addition to obtaining QOF points.

Audit standards

The following audit standards have been used to benchmark the outcomes from X-PERT Programme implementation.

Outcome	Audit standard from RCT	Audit standard from national target
Number of participants	----------	Structured education should be offered to every person and/or their carer at diagnosis, with annual reinforcement and review. The audit standard is to deliver to at least 1,000 patients per year.
Participant attendance	≥ 95% attend at least one session ≥ 80% attend 4 or more sessions	People will complete the programme if they feel they are benefitting from attending. If organisations experience poor attendance they should contact participants to investigate the reason for the poor attendance and how it could be improved.

Outcome	Audit standard from RCT	Audit standard from national target
Participant satisfaction	≥ 90%	NHS Outcomes Framework "proportion of people who feel supported to manage their condition".
Participant empowerment	≥ 10% increase from baseline (6 wks/1 year).	Standard 3 (care planning), NICE Quality Standard for adults with diabetes.
Glycated haemoglobin	≥ 4 mmol/mol reduction at 6 months and ≥6 mmol/mol reduction at 12 months	<48 mmol/mol normoglycaemia <53 mmol/mol good diabetes control <59 mmol/mol QOF target
Body weight / BMI	No increase	4kg or 5-10% weight loss
Waist circumference	≥ 2 cm reduction	< 80 cm females < 94 cm males
Systolic blood pressure	≤ 5 mmHg reduction (if relevant)	< 130 mmHg Type 1 and Type 2 with microvascular complications < 140 mmHg Type 2 (no complications)
Diastolic blood pressure	----------	< 80 mmHg
HDL cholesterol	----------	≥ 1.2 mmol/l females ≥ 1.0 mmol/l males
Total cholesterol to HDL	----------	----------
Triglycerides	----------	< 1.7 mmol/l
Triglyceride to HDL ratio	----------	<0.87
Prescribed diabetes medication	50% of participants will have either reduced diabetes medication or have remained on the same dose.	----------

Mean "all centres" results – data collected since launch (full mean data set)

The *all centres* report changes almost on a daily basis as organisations enter data, but the main outcome of the results has remained consistent for several years. All audit standards from the RCT have been met, except for waist circumference, which fell slightly short of the≥ 2 cm reduction, and uptake (total percentage who attended 1 session) which fell short of the 95% target at 84.3%.

*N.B. This report includes matched participant data which has been recorded at baseline **and** 6 months **and/or** baseline **and** 12 months. This means the 6 and 12 month results are not comparable as they include different datasets.*

X-PERT Programmes Report: All Localities (matched)- All Course Types- 01 Sep 2005 to 01 Sep 2018

Number of X-PERT programmes run in this period:	10,798	
Total number patients registered	113,047	
Total number who attended 1 session	95,284	
Total percentage who attended 1 session:	84.3%	
Total number who attended 4 or more sessions	76,979	
Total percentage who attended 4 or more sessions:	80.8%	
Mean number of attendees per programme:	8	
Attended Annual Update Module:	28.7%	
Evaluation	**6 Weeks**	
Mean program evaluation score:	94.1%	
No.(%) programmes with evaluation score	7,406 (68.6%)	
Empowerment	**Baseline:**	**6 Weeks:**
Patient Empowerment Score (1-5):	3.47	4.23
Patient Empowerment Score % Change:		21.9%
No. (%) programmes with empowerment scores	6,949 (64.4%)	6,883 (63.7%)

Clinical Data

	6 month mean	SD (σ)	6 months change from baseline	95% CI	12 month mean	SD (σ)	1 year change from baseline	95% CI
Weight (Kg)	88.0	20.0	-1.8	-1.9, -1.7	86.1	20.00	-2.0	-2.1, -1.9
BMI (Kg/m²)	31.1	6.3	-0.6	-0.6, -0.6	30.7	6.2	-0.6	-0.6, -0.6
Waist Circumference (cm)	102.1	15.2	-1.7	-1.8, -1.6	102.9	14.4	-1.5	-1.6, -1.4
HbA1c (mmol/mol)	54.5	15.0	-6.7	-6.8, -6.7	55.0	15.0	-6.6	-6.7, -6.6
Fasting Blood Glucose (mmol/l)	7.3	2.5	-0.9	-1.0, -0.8	7.3	2.6	-0.8	-0.9, -0.7
Blood Pressure Systolic (mmHg)	132	14	-2	-2, -2	131	14	-2	-2, -2
Blood Pressure Diastolic (mmHg)	76	9	-2	-2, -2	76	9	-1	-1, -1
Total Cholesterol (mmol/l)	4.2	1.1	-0.3	-0.3, -0.3	4.2	1.0	-0.3	-0.3, -0.3
LDL Cholesterol (mmol/l)	2.3	0.8	-0.2	-0.2, -0.2	2.2	0.8	-0.3	-0.3, -0.3
HDL Cholesterol (mmol/l)	1.3	0.5	0.0	0.0, 0.0	1.3	0.5	0.0	-0.1, 0.1
Non HDL Cholesterol (mmol/l)	3.0	1.1	-0.3	-0.3, -0.3	2.9	1.0	-0.4	-0.4, -0.4
Total Cholesterol to HDL Ratio	3.5	1.9	-0.4	-0.4, -0.4	3.5	1.3	-0.4	-0.4, -0.4
Triglycerides (mmol/l)	1.7	1.0	-0.2	-0.2, -0.2	1.7	1.0	-0.2	-0.2, -0.2
Triglycerides to HDL Ratio	1.5	1.8	-0.2	-0.2, -0.2	1.5	1.5	-0.2	-0.2, -0.2

All centres mean results: 1st January 2016 to 31st December 2017

X-PERT Programmes Report: All Localities (matched)- X-PERT Diabetes 01 Jan 2016 to 31 Dec 2017

Number of X-PERT programmes run in this period:	2,174	
Total number registered:	26,129	
Total number who attended 1 session:	19,841	
Total percentage who attended 1 session:	75.9%	
Total number who attended 4 or more sessions:	15,984	
Total percentage who attended ≥ 4 sessions:	80.6%	
Mean number of attendees per programme:	9.1	
Attended Annual Update Module:	2.3%	
Evaluation	**6 Weeks**	
Mean program evaluation score	95%	
No.(%) programmes With evaluation score	1,568 (72.1%)	
Empowerment	**Baseline**	**6 Weeks**
Patient Empowerment Score (1-5)	3.7	4.5
Patient Empowerment Score % Change		21.6%
No. (%) programmes With empowerment scores	1,536 (70.7%)	1,514 (69.6%)

Clinical Data

	6 month mean	SD (σ)	6 month change from baseline	95% CI	12 month mean	SD (σ)	1 year change from baseline	95% CI
Weight (Kg)	87.9	19.6	-2.7	-3.9, -1.5	84.2	19.7	-2.3	-3.3, -1.3
BMI (Kg/m2)	31.0	6.4	-0.9	-1.3, -0.5	30.2	6.1	-0.8	-1.1, -0.5
Waist Circumference (cm)	101.6	15.1	-3.3	-5.1, -1.5	103.7	14.1	-2.4	-4.1, -0.7
HbA1c (mmol/mol)	52.8	14.0	-8.4	-9.1, -7.7	53.7	14.5	-7.9	-8.6, -7.3
Fasting Blood Glucose (mmol/l)	6.7	2.0	-0.9	-1.1, -0.7	6.9	2.2	-0.7	-1.0, -0.4
Blood Pressure Systolic (mmHg)	132	14	-2	-3, -1	129	13.4	-2	-2.7, -1.3
Blood Pressure Diastolic (mmHg)	76	10	-2	-3, -1	76	8.4	-1	-2, -1
Total Cholesterol (mmol/l)	4.3	1.0	-0.2	-0.3, -0.2	4.2	1.0	-0.4	-0.5, -0.4
LDL Cholesterol (mmol/l)	2.4	0.9	-0.1	-0.2, -0.0	2.3	0.8	-0.2	-0.3, -0.2
HDL Cholesterol (mmol/l)	1.3	0.6	0.0	0.0, -0.0	1.3	0.6	0.1	0.1, 0.1
Non HDL Cholesterol (mmol/l)	3.0	1.4	-0.3	-0.4, -0.2	3.1	1.5	-0.2	-0.3, -0.1
Total Cholesterol to HDL Ratio	3.7	3.7	-0.3	-0.5, -0.1	3.6	1.7	-0.3	-0.4, -0.2
Triglycerides (mmol/l)	1.7	1.0	-0.2	-0.3, -0.1	1.8	1.0	-0.1	-0.2, -0.0
Triglycerides to HDL Ratio	1.6	3.6	-0.1	-0.3, 0.1	1.6	0.9	-0.2	-0.3, -0.1

Comparison with the full mean data set

A greater emphasis on structured education means that 23% (n=26,129) of the 113,047 patients registered on the audit database have been invited to attend the X-PERT Programme between 2016-2017. Of these, the percentage of people taking up the opportunity to attend is 75.9%. Although this is lower than the full mean data set score of 84.3%, this is a slight increase from the previous year which was 75.0%. Great variation is still evident between organisations and so processes need to be put in place to help improve uptake. The number of people completing the programme is also slightly increased from the previous year at 80.6%, as has the evaluation score (95.0-95.8%). The change in empowerment score at six weeks has risen from 19.0% to 21.6%, which is still well above the audit standard (10%). The mean number of participants per programme has remained relatively consistent at 9.1 (9.3 in 2015-2016).

Matched participant data has been used for this year's audit. Data is matched if it has been entered for the patient at both baseline **and** six months and/or both baseline **and** one year. Matched participant data analysis displays that, between 2016 and 2017, X-PERT Programme implementation has resulted in a mean weight loss of -2.7kg (6 months) and -2.3kg (1 year), with robust confidence intervals (CIs). This is an improvement upon the full mean data set for 6 months (-1.8kg) and 12 months (-2.0kg). One reason for this may be because the curriculum has been updated with the scientific evidence that supports people in adopting a sustainable dietary approach which enables them to achieve their health goals, whilst recognising that one size does not fit all. A mean reduction in HbA1c values from baseline is evident at both 6 months (-8.4mmol/mol) and 12 months (-7.9mmol/mol). CIs for these figures are robust and this is also an improvement on the full mean data set at both 6 and 12 months (-6.7mmol/mol and -6.6mmol/mol respectively).

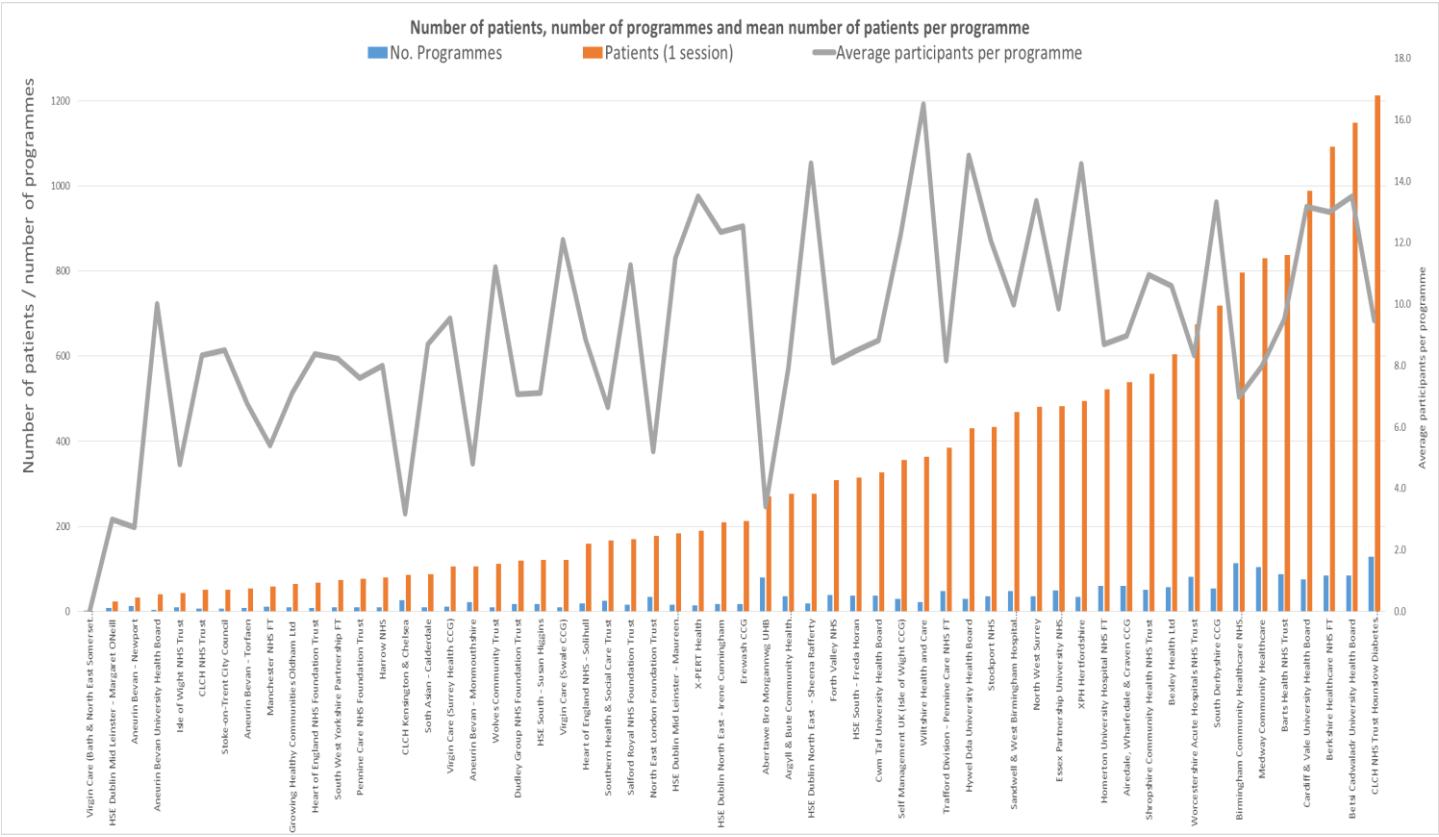
Comparison of individual organisation outcomes 1st January 2016 to 31st December 2017

The 2018 awards are for matched participant data entered between 1st January 2016 and 31st December 2017. The mean value for each outcome has been compared between organisations. Data was only included if more than five sets of matched participant data (five participants) had been recorded at baseline **and** 6 months and/or baseline **and** 12 months. The number of matched sets was taken into consideration for each health outcome award.

The best participant experience

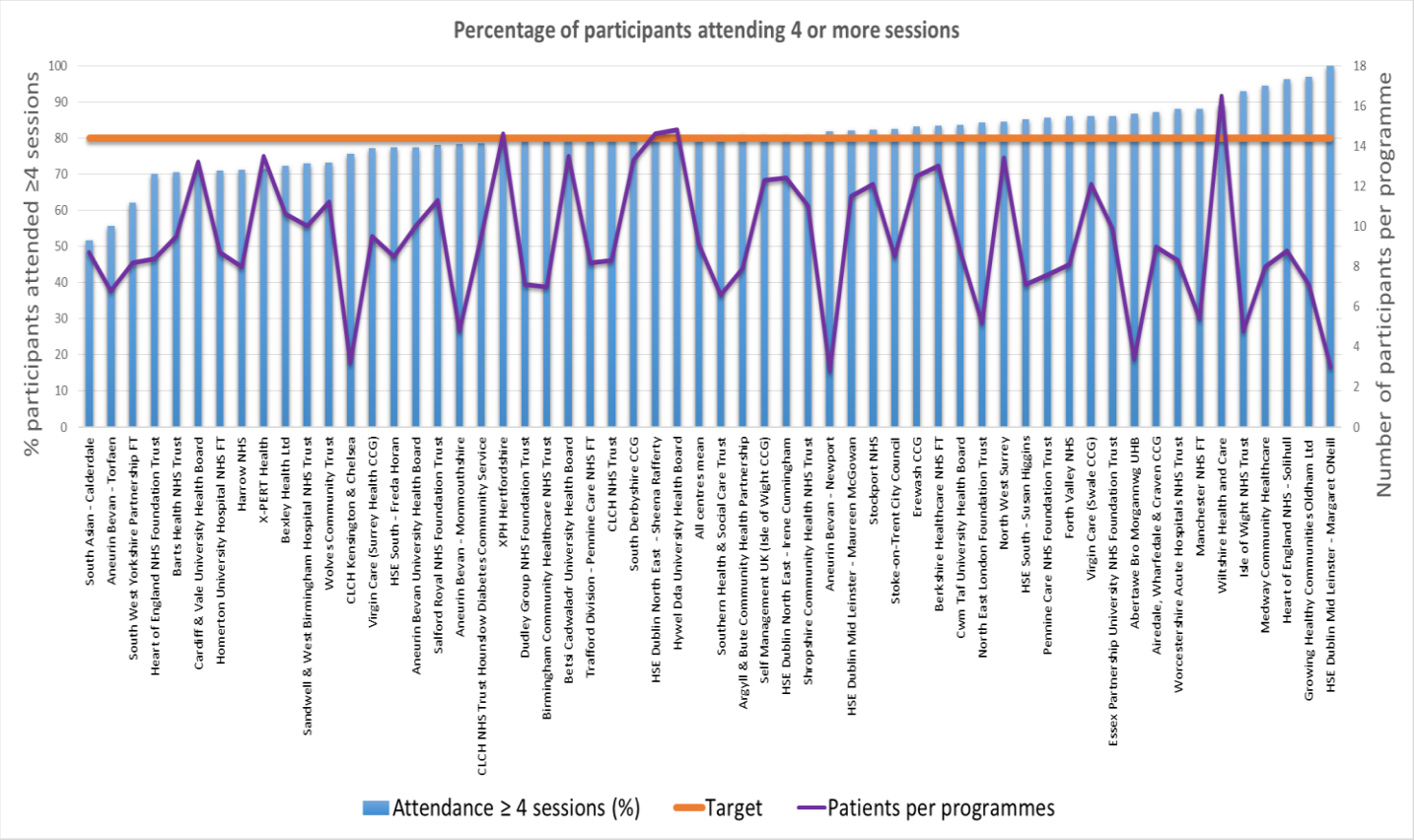
This award category looked at the following criteria: number of programmes delivered; number of participants per session; uptake (% attending at least one session); attendance (% attending four or more sessions); participant empowerment change and participant satisfaction. Organisations were only considered for this award if they met the audit standards.

No. of participants, no. of programmes and mean no. of participants per programme



The graph above presents the number of participants per organisation who have attended the X-PERT Programme in 2016-2017 ***and have had their outcomes entered onto the audit database***. To date 113,047 participant records have been entered. Nine organisations have not entered any participants' data. CLCH NHS Trust Hounslow Diabetes Community Service entered the highest number of attendees in 2016-2017 (n= 1213) with a mean of 10 participants per programme. Betsi Cadwaladr University Health Board and Berkshire Healthcare NHS FT had the second and third highest attendee numbers respectively. Wiltshire Health and Care achieved the greatest mean number of participants per programme (mean = 17 participants).

Participant attendance

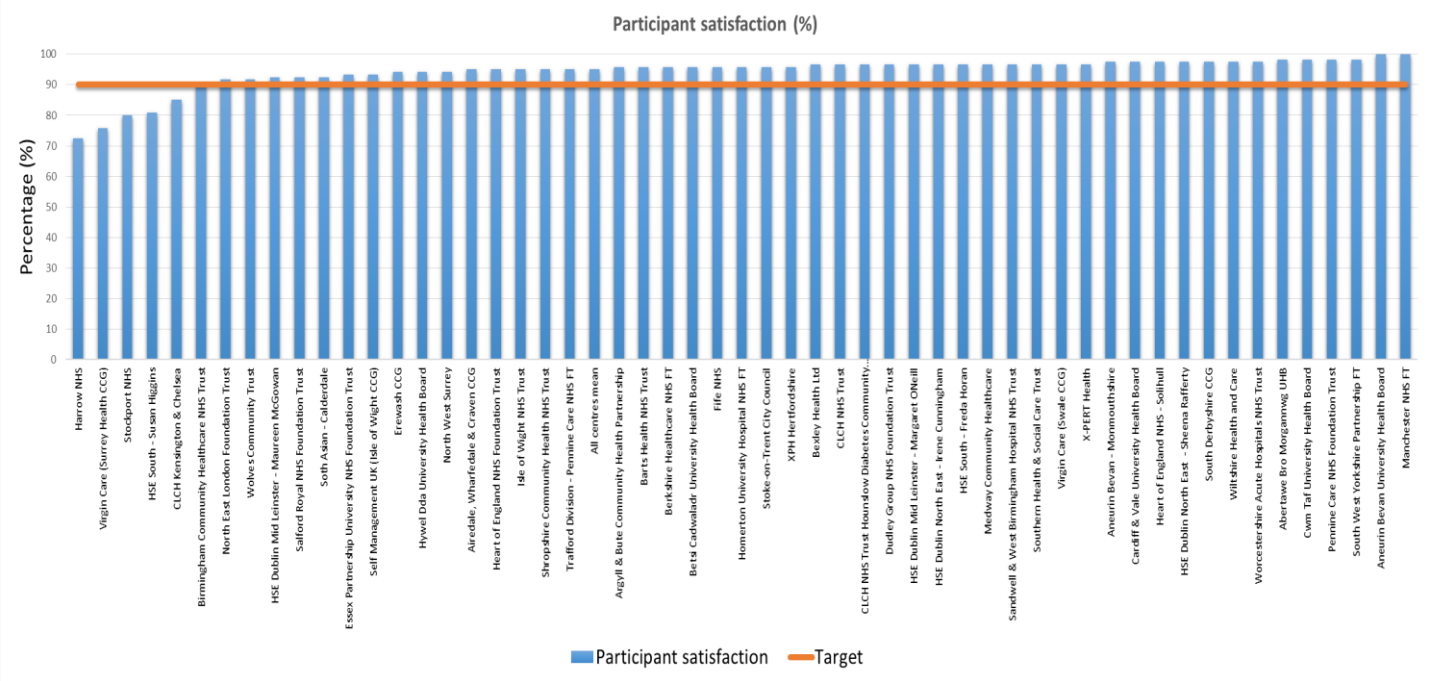


The mean *all centre* attendance score (percentage of X-PERT participants who have attended four or more sessions) is 80.6%**.** The audit standard derived from the clinical trial is 80% (orange line in the graph above). Fifty-seven organisations reported attendance and 34 organisations (60%) obtained a mean attendance score equal to or above the audit standard. Reasons for not meeting the audit standard need to be explored i.e. whether this is due to incomplete data entry or in programme implementation.

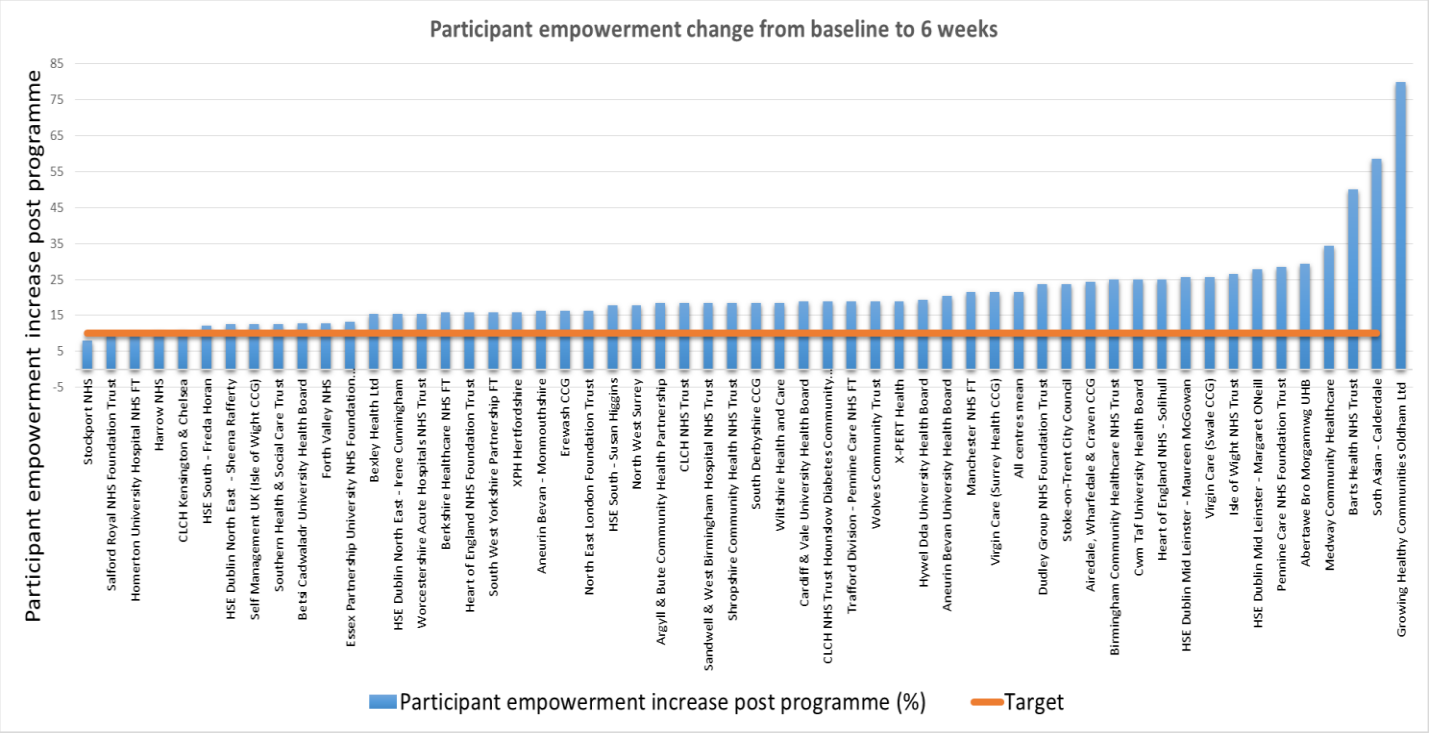
Participant satisfaction & empowerment

Participants complete an evaluation questionnaire in Session 6 of the X-PERT programme and each questionnaire is scored from 1 (dissatisfied) to 12 (extremely satisfied). Participants are also provided with a validated empowerment questionnaire that is completed by participants in Session 1 and repeated in Session 6. Individual scores are calculated with 1 (disempowered) to 5 (extremely empowered). Mean scores for

satisfaction and empowerment are calculated per programme and entered onto the audit database. The change in empowerment score from baseline is then automated by the database.



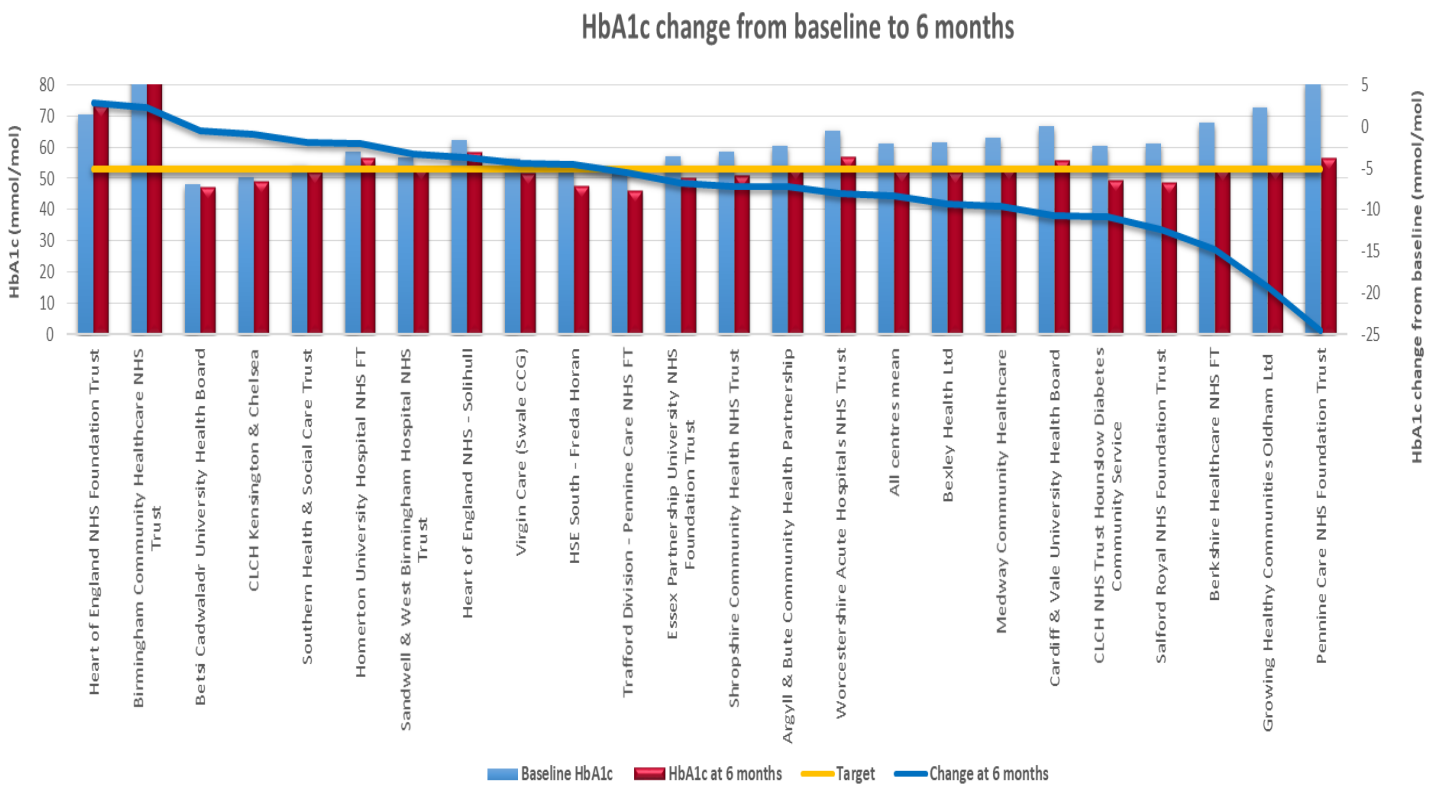
At 6 weeks the mean *all centre* X-PERT participant satisfaction score is 95%**.** The audit standard is 90% (orange line in the graph above)**.** Forty-nine organisations (91% of organisations who had entered data) achieved the audit standard for participant satisfaction. Exploration into why some organisations are obtaining lower satisfactions scores is required. Aneurin Bevan University Health Board and Manchester NHS FT achieved the best results**,** both with mean participant satisfaction scores of 100%.

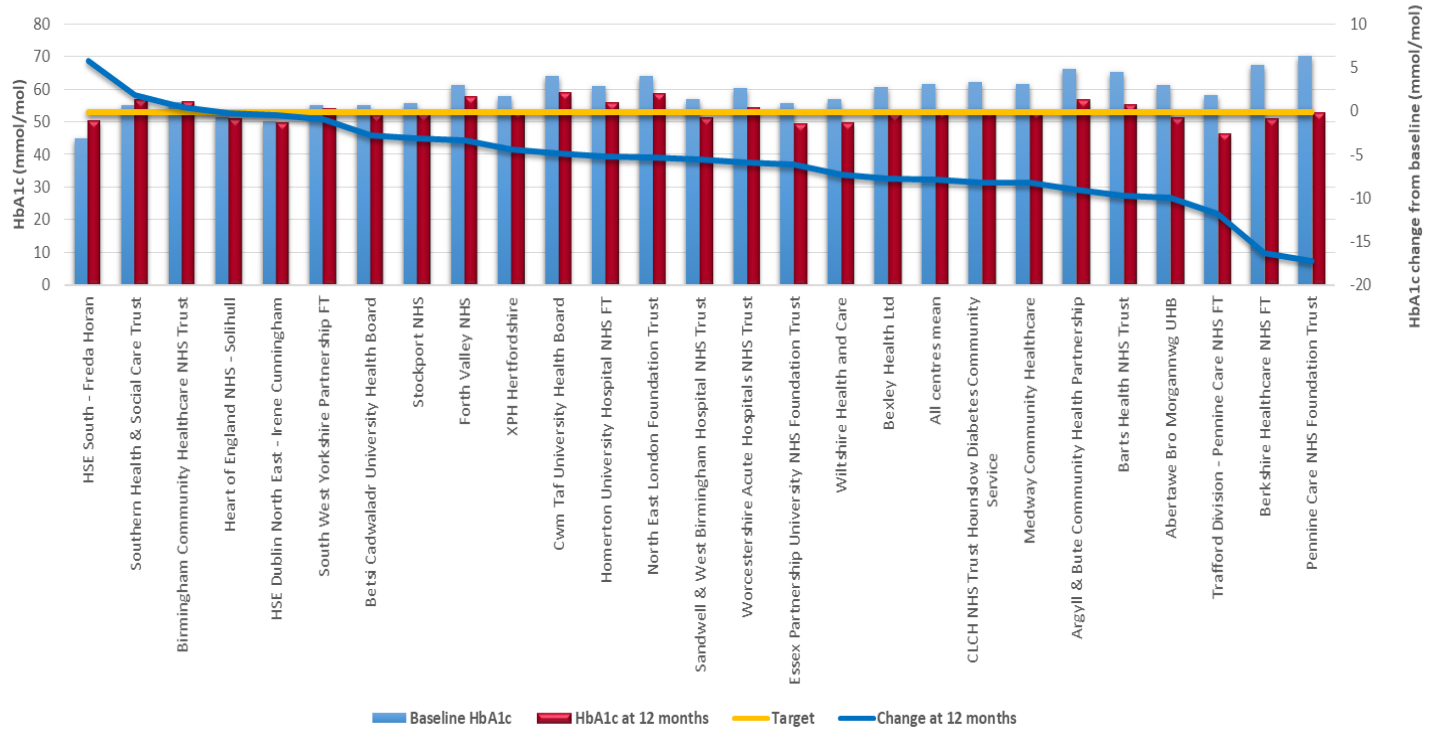


The clinical trial demonstrated a 24% increase in participant empowerment at 6 weeks; the *all centres mean* in the audit is +21.6%. The audit standard for implementation has been set at 10% (see orange line above). Fifty-four organisations (98%) achieved the audit standard for empowerment. This is the same result as last year, both of which were a significant improvement upon previous years.

Taking all these criteria into account, the best participant experience award goes to Cwm Taf Unviersity Health Board who delivered 37 programmes, achieved 89.3% attendance, 83.7% completion, 25% increased empowerment at 6 weeks and 98.3% satisfaction whilst averaging 8.8 participants per session. Wiltshire Health and Care have been awarded 2nd place. They delivered 22 programmes, achieved 91.7% attendance, 89% completion, 18.4% increased empowerment at 6 weeks, 97.5% satisfaction whilst averaging 16.5 participants per session. 3rd place has been awarded to Pennine Care NHS Foundation Trust who delivered a total of 10 programmes with a mean of 8.2 participants per programme and achieved 98.7% attendance 85.5% completion, 28.6% increase in participant empowerment and 98.3% satisfaction.

Glycated haemoglobin (HbA1c)





At 6 months the mean *all centre* reduction in glycated haemoglobin for X-PERT participants is 8.4 mmol/mol (95% CI: -9.1, -7.8) to 52.7 mmol/mol and at 12 months, a 7.9 mmol/mol reduction to 53.7 mmol/mol (95% CI: -8.55, -7.25). The clinical trial demonstrated a 4 mmol/mol improvement in glycated haemoglobin at four months and 7.7 mmol/mol at 12 months. The audit standard is an HbA1c value of ≤53mmol/mol (yellow lines on graphs above).

Twenty-three organisations reported HbA1c at 6 months. Although only thirteen organisations (57%) achieved the audit standard for glycated haemoglobin at 6 months (≤53mmol/mol), 21 organisations (91%) demonstrated a mean reduction in HbA1c (blue line and axis on the right side in the graphs above). Twenty-six organisations reported HbA1c at 12 months, 23 (88%) of which demonstrated a mean reduction in HbA1c (blue line and axis on the right side in the graphs above). Twelve organisations met the audit standard at 12 months (46%).

To be considered for an award the following criteria were taken into consideration: HbA1c reduction at both 6 and 12 months; number of matched participants' data entered; percentage of attendees that had matched data, robust 6 and 12 months 95% confidence intervals. Medway Community Healthcare Trust overall achieved the best results with a mean 6 and 12 month reduction of 9.6 mmol/mol (95% CI: -11.2, -8.0) in 695 patients and 8.2 mmol/mol (95% CI: -10.0, -6.4) in 505 patients respectively. In 2nd place Berkshire Healthcare NHS Foundation Trust achieved the greatest reduction with a 14.8 mmol/mol mean reduction at 6 months in 196 patients (95% CI: -17.2, -12.4) and a 16.3 mmol/mol mean reduction at 12 month in 115 patients (95% CI: -19.0, -13.6). In 3rd place, CLCH NHS Trust Hounslow Diabetes Community Service achieved a 10.9 mmol/mol (95% CI: -15.7, -6.1) reduction in HbA1c at six months for 21 patients and an 8.2 mmol/mol reduction at 12 months in 367 patients (95% CI: -10.0, -6.4).

The largest impact on body weight and waist circumference

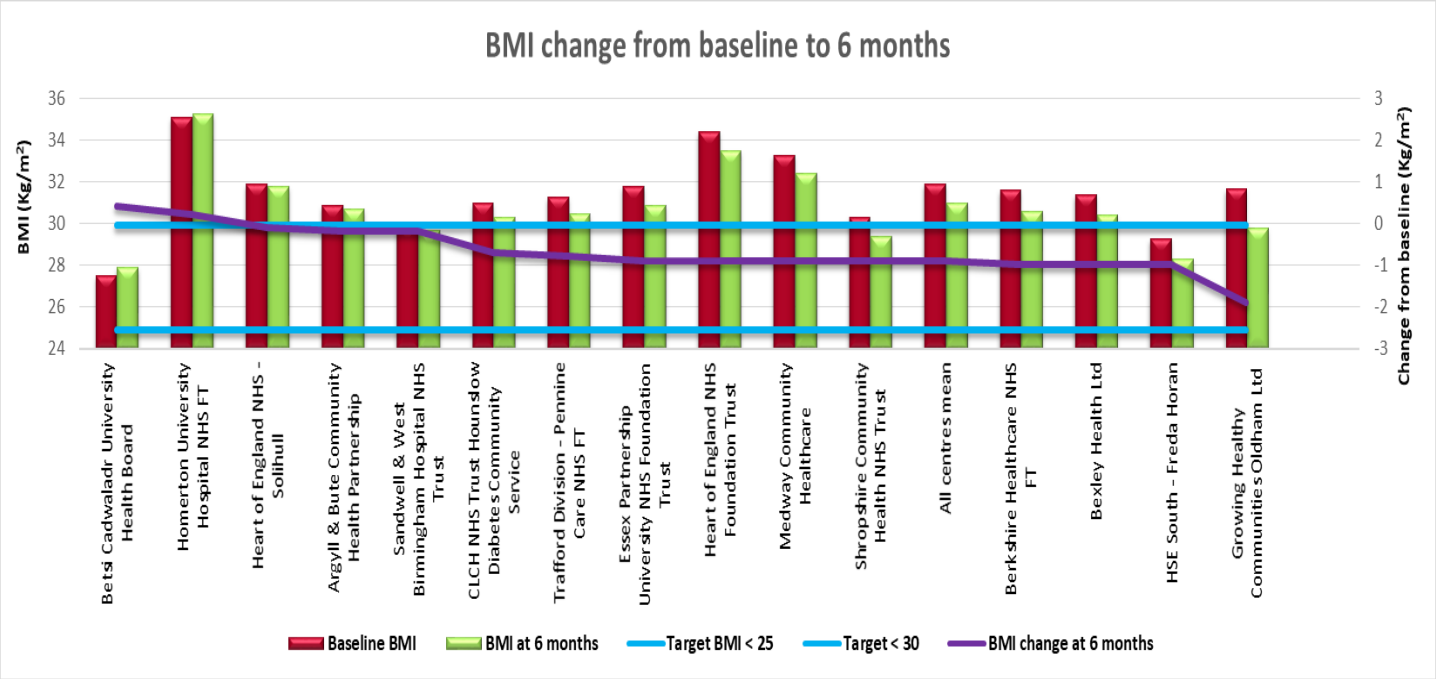
For the anthropometric award category, the following criteria were taken into consideration: body weight and waist circumference reduction at six and 12 months; number of matched participants' data for baseline plus 6 and/or 12 months, and average number of attendees per programme.

Body weight

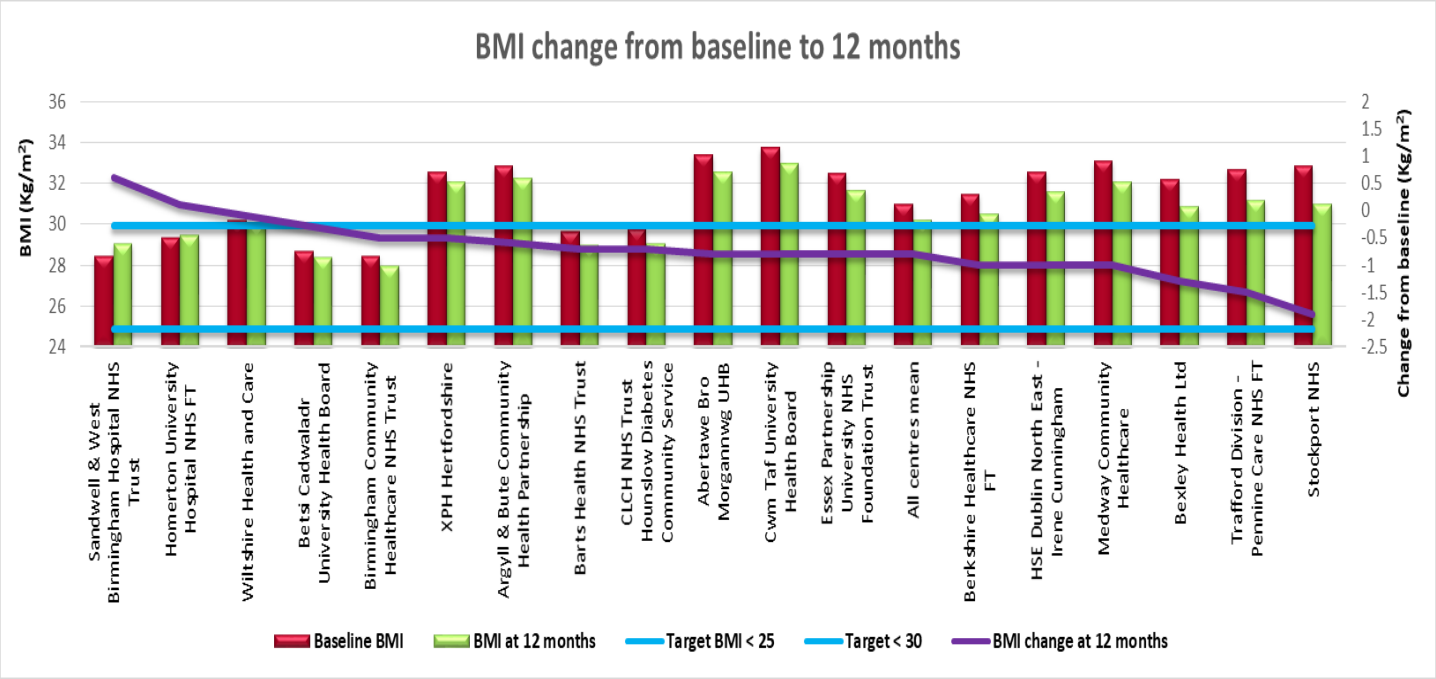
At 6 months the mean *all centre* reduction in body weight for X-PERT participants is 2.7kg (95% CI: -3.9, -1.5) from 90.6kg to 87.9kg; a 3% weight loss. Fifteen organisations entered data for weight at 6 months and 12 of these organisations (80%) documented a mean weight loss between 0.8kg and 3.8kg (blue bar). The percentage change from baseline was between +1% and -4% (yellow line and axis on the right side). Berkshire Healthcare NHS FT achieved the best results at 6 months with a mean weight loss of -3.8 (4%) (95% CI: -6.5, -1.1), with a greater reduction still at 12 months, -4kg (4%) (95% CI: -7.4, -0.6).

At 12 months the mean *all centre* reduction in body weight for X-PERT participants is 2.3kg (95% CI: -3.3, -1.3) from 86.5kg to 84.2kg. Twenty organisations entered data for weight at 12 months and 17 (85%) demonstrated a mean weight reduction (blue bars and left vertical axis in graph above [kg change] and yellow line and right vertical axis in the graph above [% change]) between 0.2kg and 5.9kg (0.2-7.0%). Stockport NHS were highly commended for their weight loss data 12 months, of -5.9kg (95% CI: , -11.8, -0.0), and a waist circumference reduction by 5.3cm (95% CI: -11.9, 1.3), however no 6 month data was provided and the confidence intervals suggests the data are not robust.

Body Mass Index (BMI)

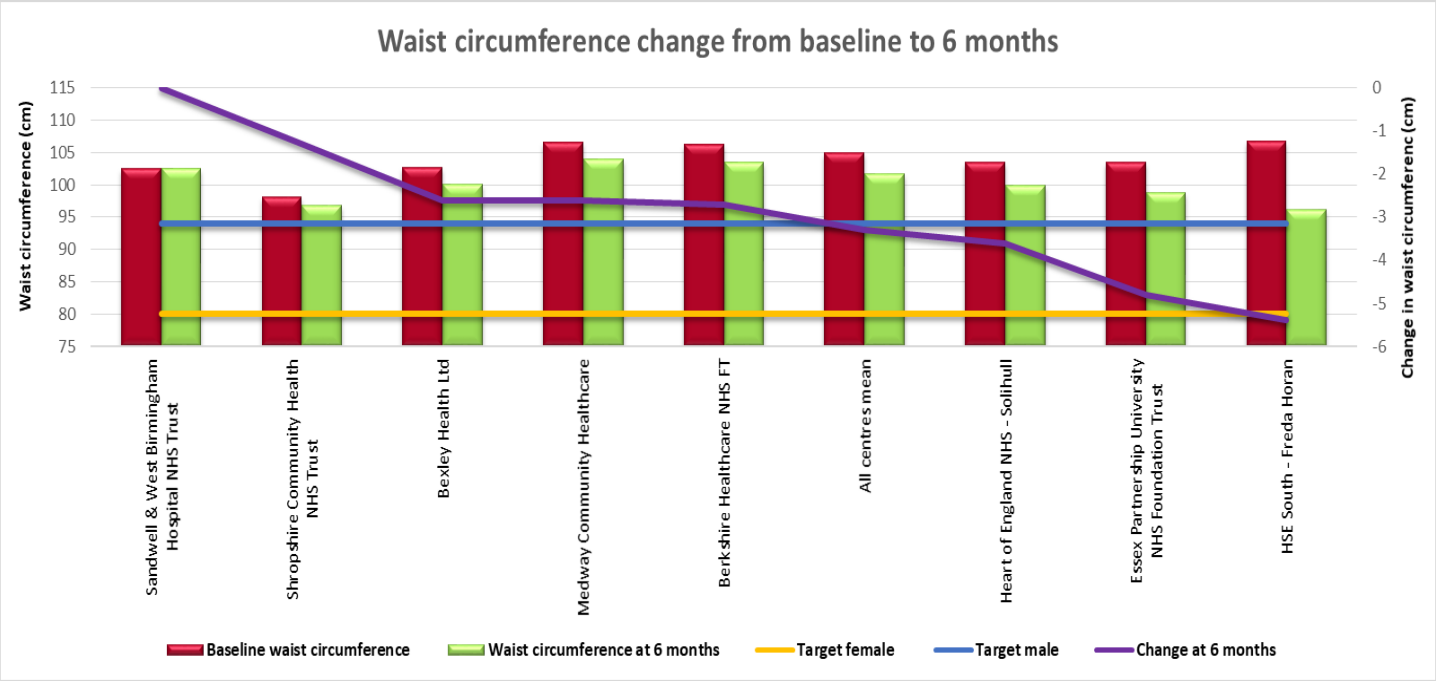


At 6 months the mean *all centre* reduction in BMI for X-PERT participants is 0.9 kg/m² (95% CI: -1.3, -0.5), from 31.9 kg/m² to 31.0 kg/m². Target lines of BMI <30 and BMI <25 have been inserted into the graph above. Fifteen organisations entered BMI data at 6 months. At baseline all organisations had a mean BMI in the overweight or obese range. Thirteen organisations (87%) demonstrated a mean reduction in BMI (purple line and axis on the right side in the graph above). Growing Healthy Communities Oldham Ltd achieved the greatest mean reduction of 1.9 kg/m² (95% CI: -4.2, 0.4), however their confidence intervals suggest that the data was not robust.

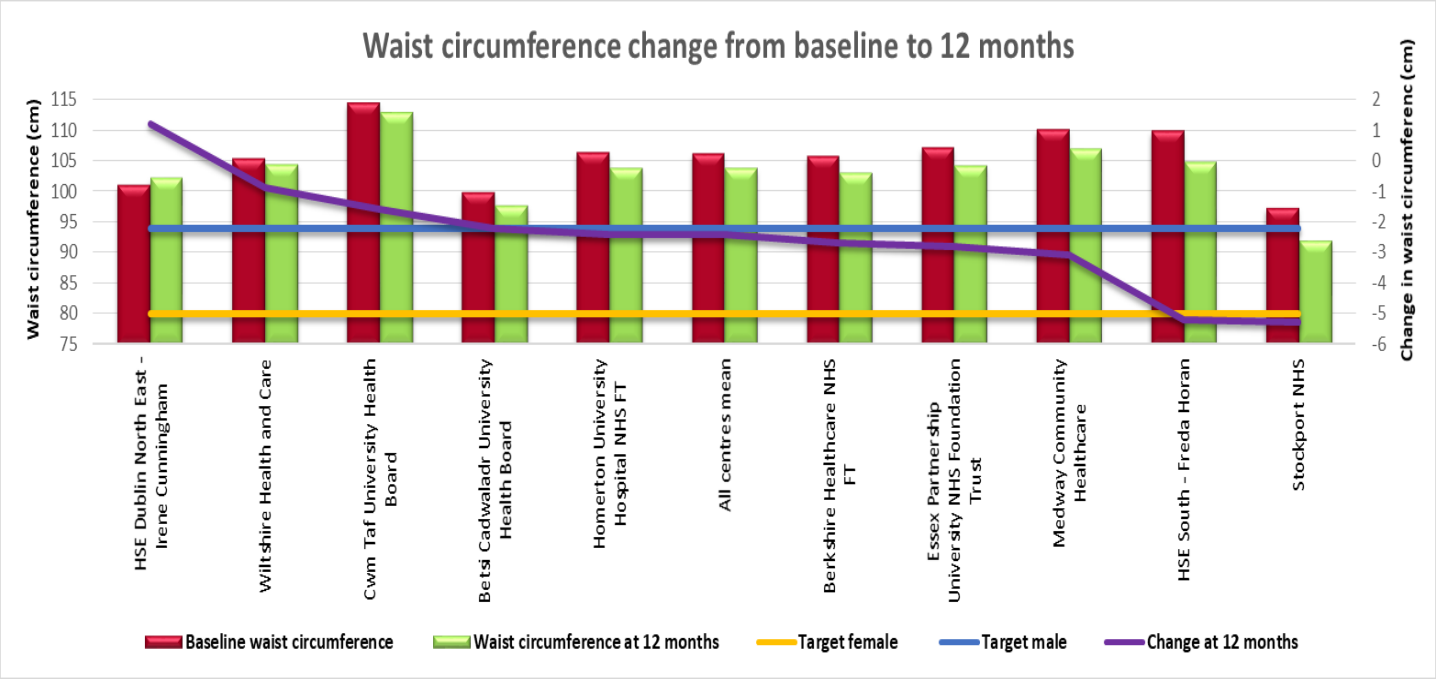


At 12 months the mean *all centre* reduction in BMI for X-PERT participants is -0.8 kg/m² (95% CI: -1.1, -0.5) from 31.0 kg/m² to 30.2 kg/m². Eighteen organisations entered BMI data at 12 months. Of these, 12 (67%) had baseline mean BMI values in the obese range (≥30 kg/m²). Sixteen organisations (89%) demonstrated a mean reduction in BMI (purple line and axis on the right side in the graph above). Stockport NHS achieved the greatest reduction in BMI of 1.9 kg/m² (95% CI: -4.8, 1.0), however, similarly to 6 month data, the confidence intervals suggest that the data were not robust.

Waist circumference



At 6 months the mean *all centre* reduction in waist circumference for X-PERT participants is 3.3cm (95% CI: -5.1, -1.5) from 104.9cm to 101.6cm. Visceral fat is a risk factor for cardiovascular disease. The recommended waist circumference of a female is ≤80 cm and for males is ≤94 cm. Only eight organisations entered waist circumference data at 6 months. The graph above demonstrates that the mean waist circumference in every organisation is above the ideal range. At 6 months, seven organisations (88%) demonstrated a mean reduction in waist circumference (purple line and axis on the right side in the graph above). HSE South - Freda Horan achieved the best results at 6 months with a mean reduction of 5.4cm (95% CI: -12.2, -1.4).

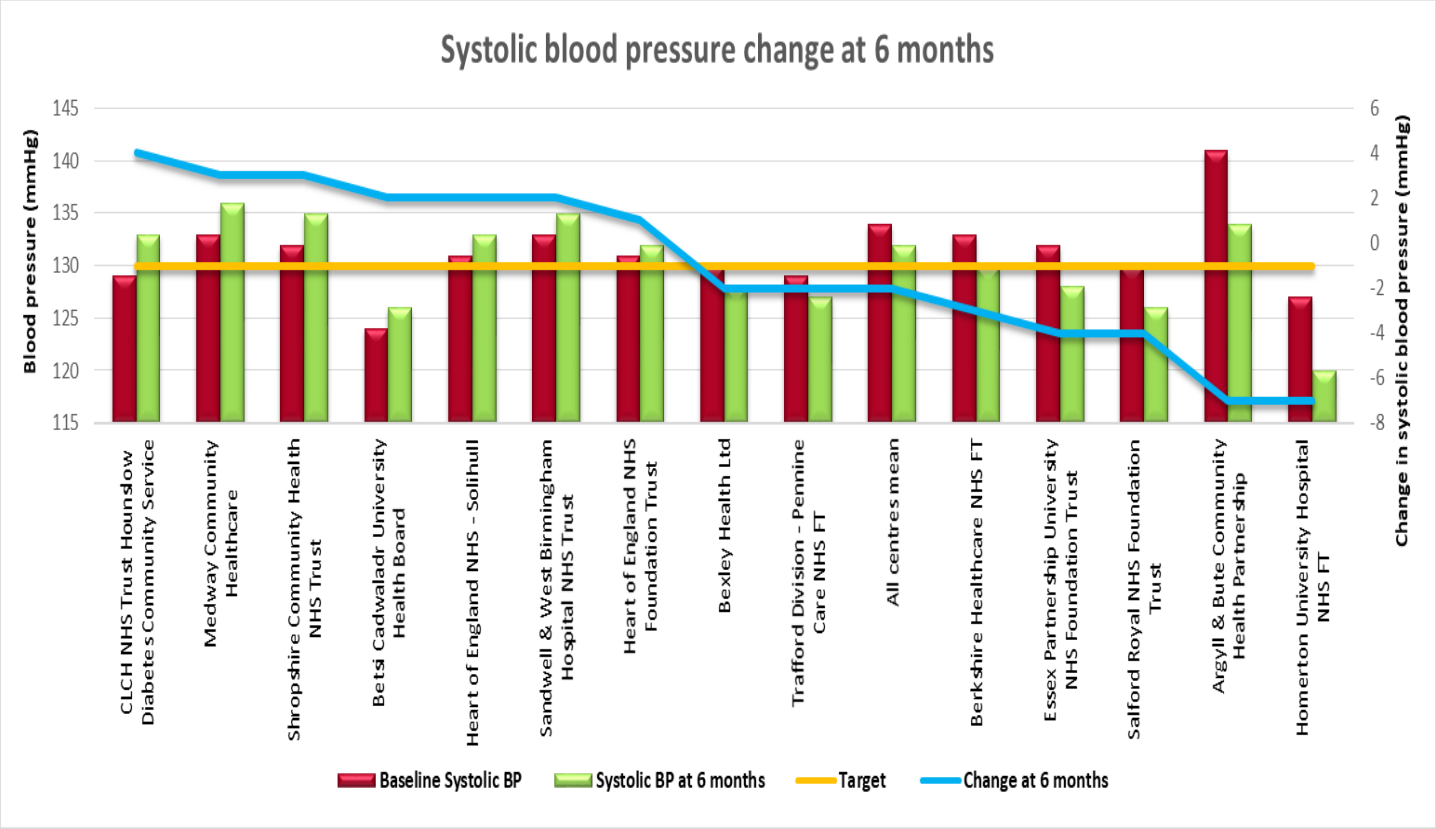


At 12 months the mean *all centre* reduction in waist circumference for X-PERT participants is 2.4cm (95% CI: -4.1, -0.7) from 106.1cm to 103.7cm. Only ten organisations reported waist circumference at 12 months and nine organisations (90%) demonstrated a mean reduction in waist circumference (purple line on graph above). Stockport NHS achieved the greatest mean reduction of 5.3cm (95% CI: -11.9, 1.3), although confidence intervals suggested that data was not robust.

Cardiovascular disease (CVD) risk reduction

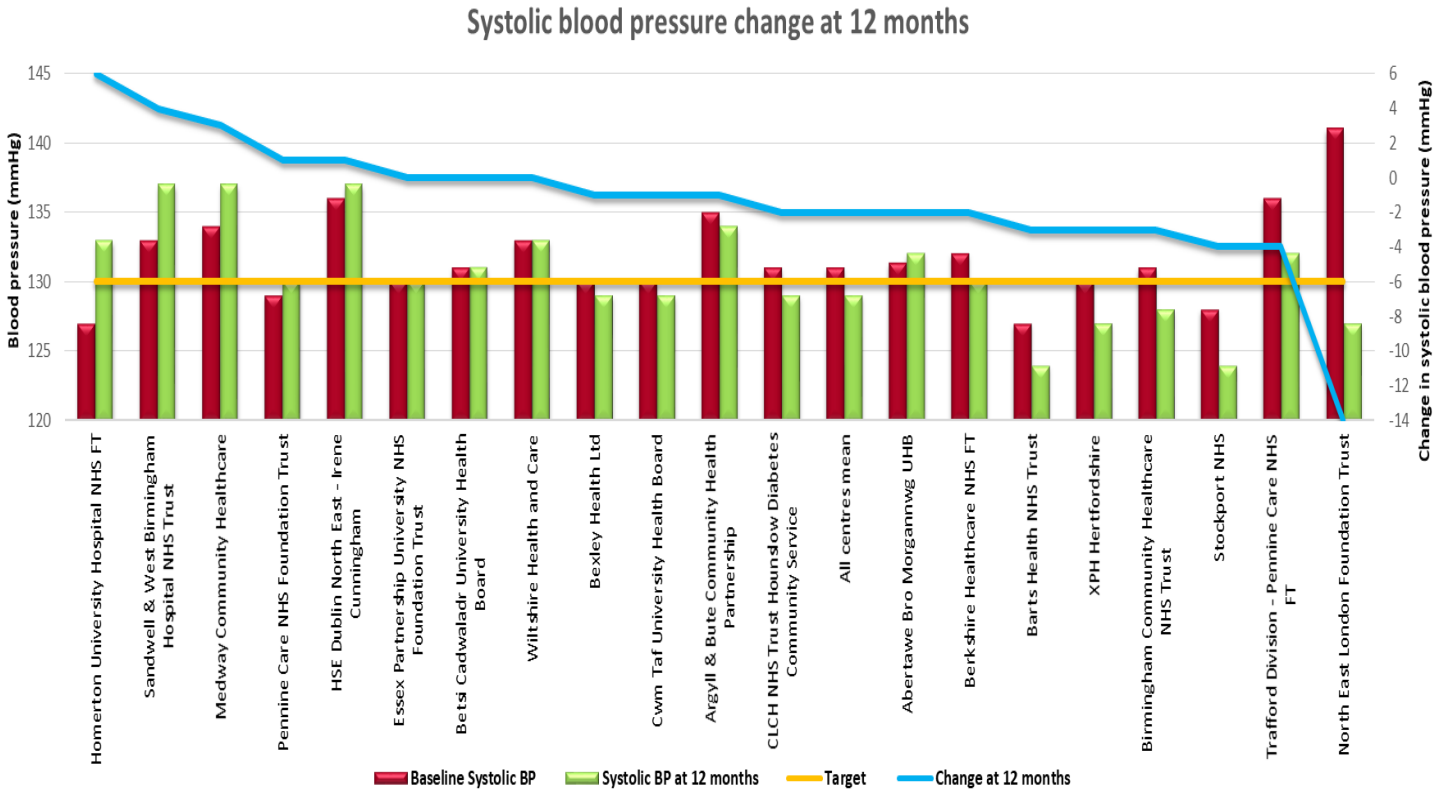
This award category considered the following criteria: reduction in total cholesterol to HDL ratio; reduction in triglyceride to HDL ratio; reduction in systolic and diastolic blood pressure at 6 and 12 months; number of matched participants' data for baseline plus 6 and/or 12 months; robust 95% confidence intervals.

Systolic blood pressure



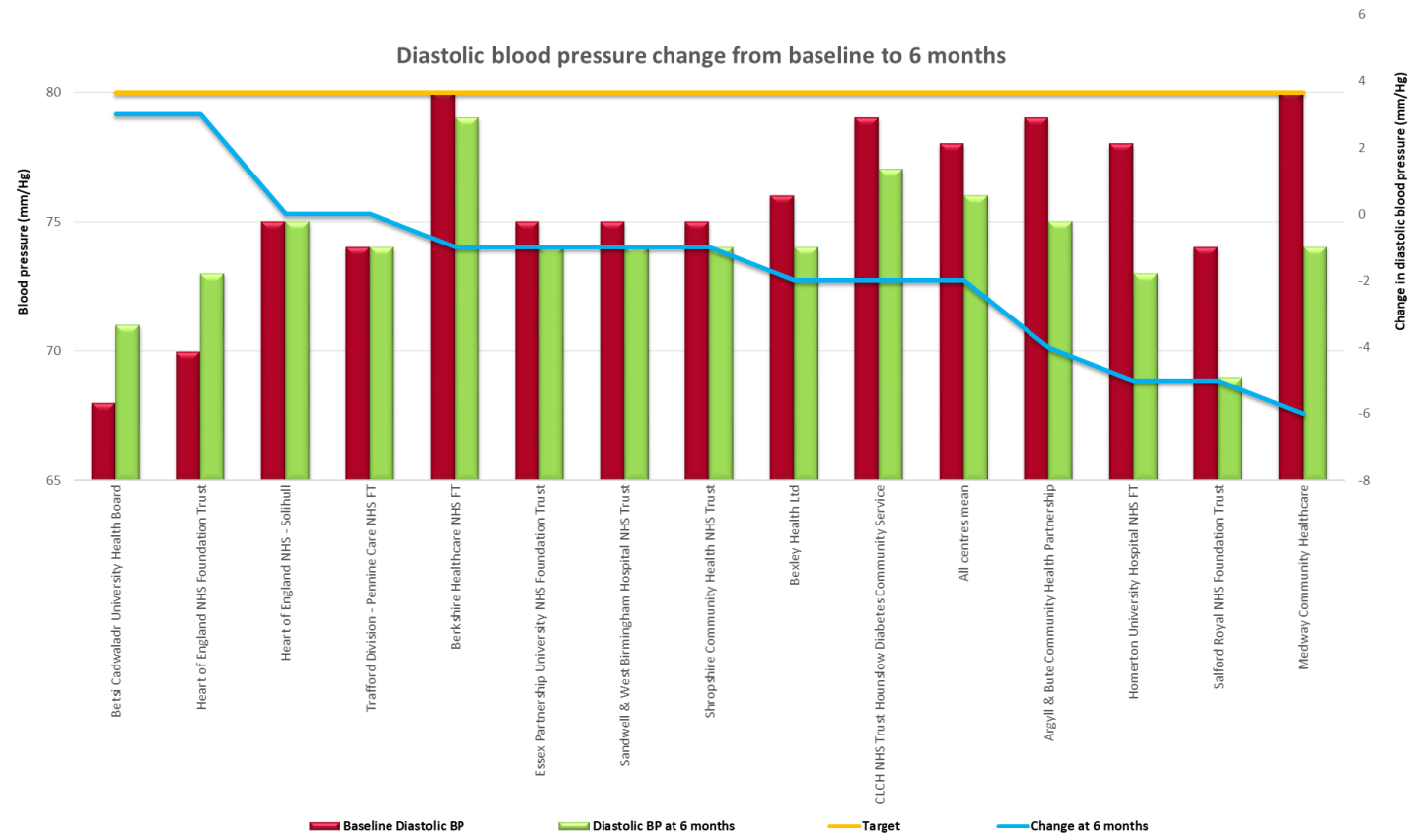
At 6 months the mean *all centre* reduction in systolic blood pressure for X-PERT participants is 2 mmHg (95% CI: -3, -1) from 134 to 132 mmHg. The recommended systolic blood pressure for an individual with Type 2 diabetes with no microvascular complications is ≤ 140 mmHg and the recommendation for Type 1 diabetes and for those with retinopathy or nephropathy is ≤ 130 mmHg (yellow target line). Fourteen organisations provided systolic BP data at six months. Mean blood pressure was already below target at baseline for four organisations. At six months, eight organisations demonstrated a mean reduction in systolic blood pressure

(blue line in the graph above), moving them towards or below the 130 mmHg target. Seven out of the 14 organisations achieved a mean blood pressure at or below this target at 6 months. Argyll & Bute Community Health Partnership achieved the greatest results at 6 months with a mean reduction of 7 mmHg (95% CI: -13.7, -0.3), however there was only matched data for 12 patients. Homerton University Hospital NHS FT also achieved a 7 mmHg reduction, however the confidence intervals suggest the data were not robust and there was only matched data for five patients.

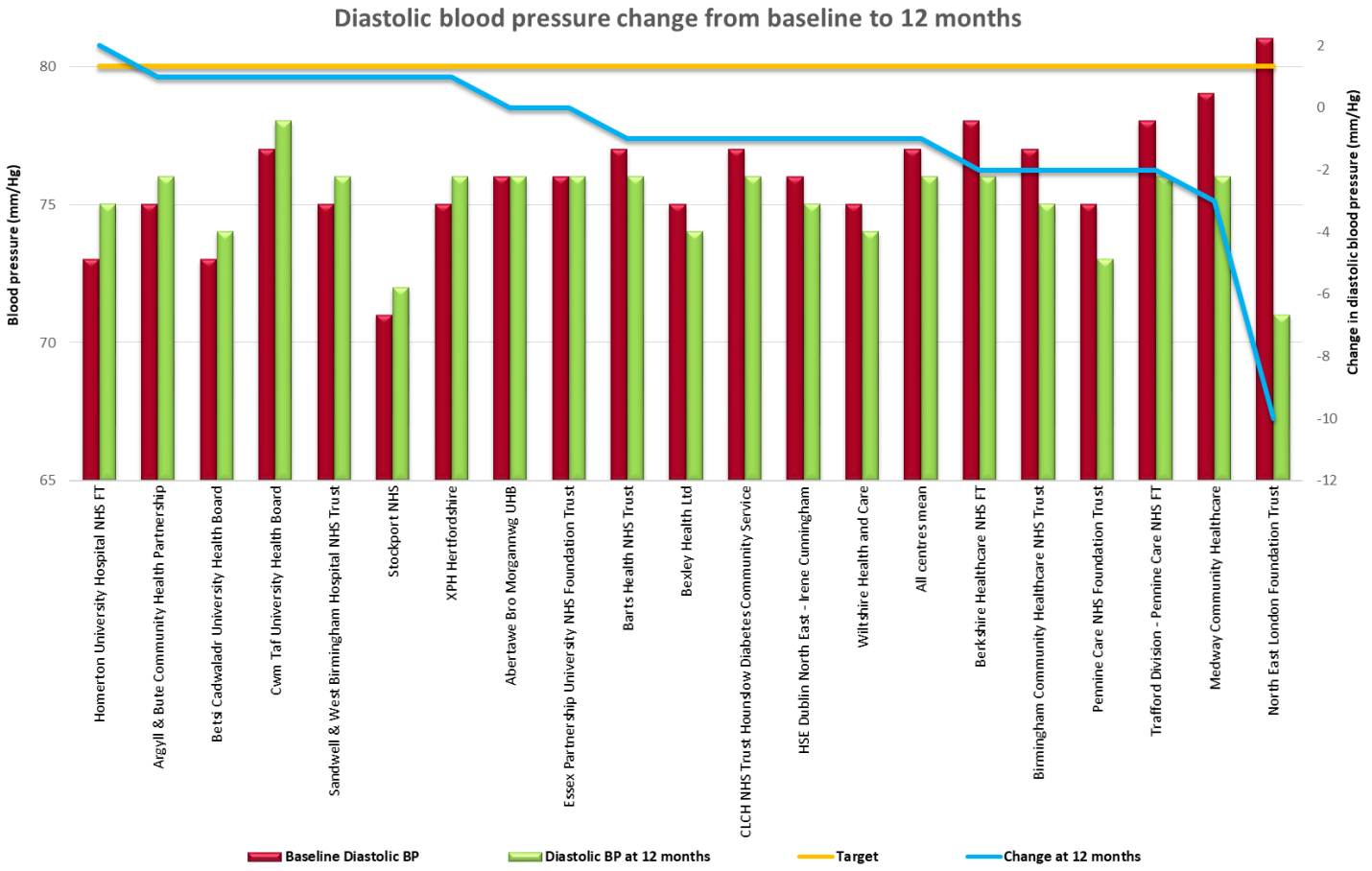


At 12 months the mean *all centre* reduction in systolic blood pressure for X-PERT participants is 2 mmHg (95% CI: -3, -1) from 131 to 129 mmHg. Twenty organisations reported systolic blood pressure at 12 months and 12 (60%) reported a mean reduction (blue line in the graph above), with three organisations reporting no change. Eight organisations (40%) achieved the 130mmHg target at baseline and 11 organisations (55%) achieved it by 12 months. North East London Foundation Trust obtained the best results with a mean reduction of 14 mmHg (95% CI: -25, -3), however there were only five matched participant data sets available.

Diastolic blood pressure



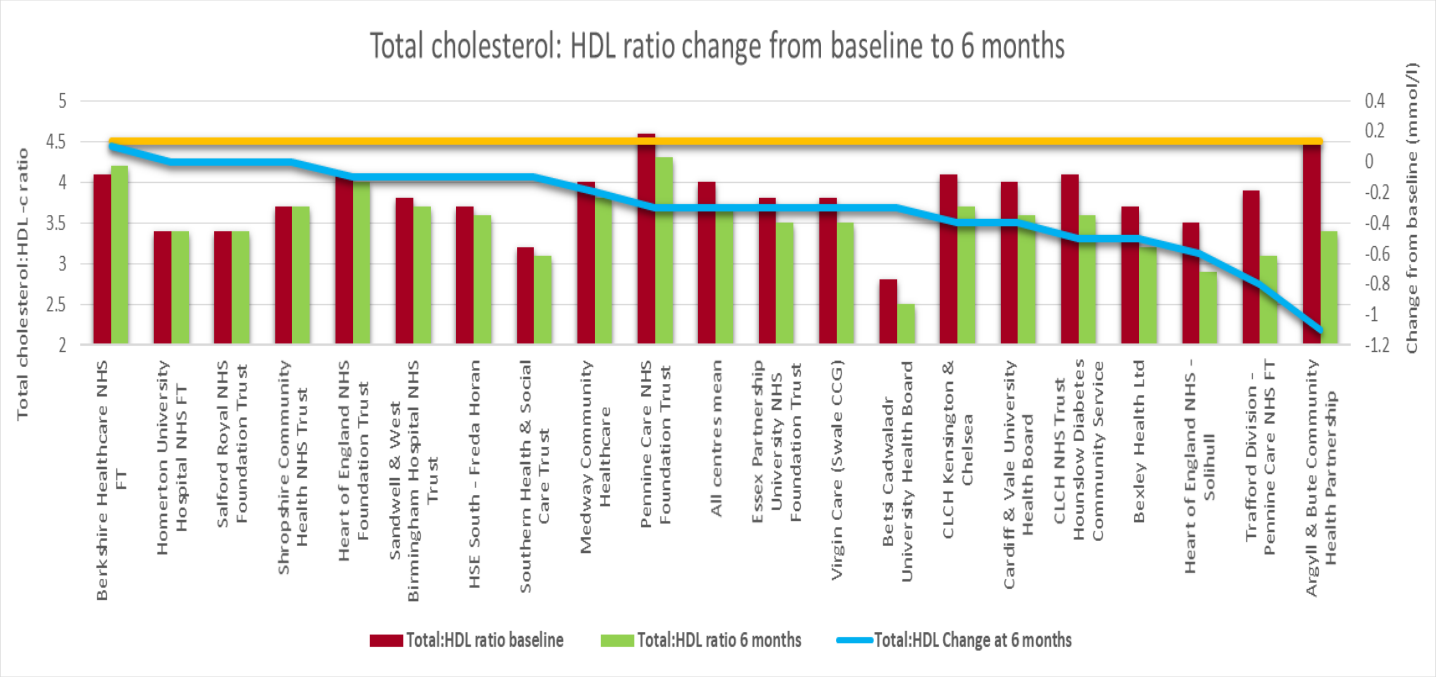
At 6 months the mean *all centre* reduction in diastolic blood pressure for X-PERT participants is 2 mmHg (95% CI: -3, -1) from 78 to 76 mmHg**.** The recommended diastolic blood pressure for people with diabetes is ≤80 mmHg (yellow target line in the graph above). The baseline figures demonstrate that all the organisations have mean diastolic blood pressure readings equal to or below the 80 mmHg target. Fourteen organisations entered data for diastolic blood pressure at 6 months and 10 organisations demonstrated a mean reduction in diastolic blood pressure (blue line in the graph above). Medway Community Healthcare achieved the best results with a mean reduction of 6 mmHg (95% CI: -8, -4) from 58 matched data sets.



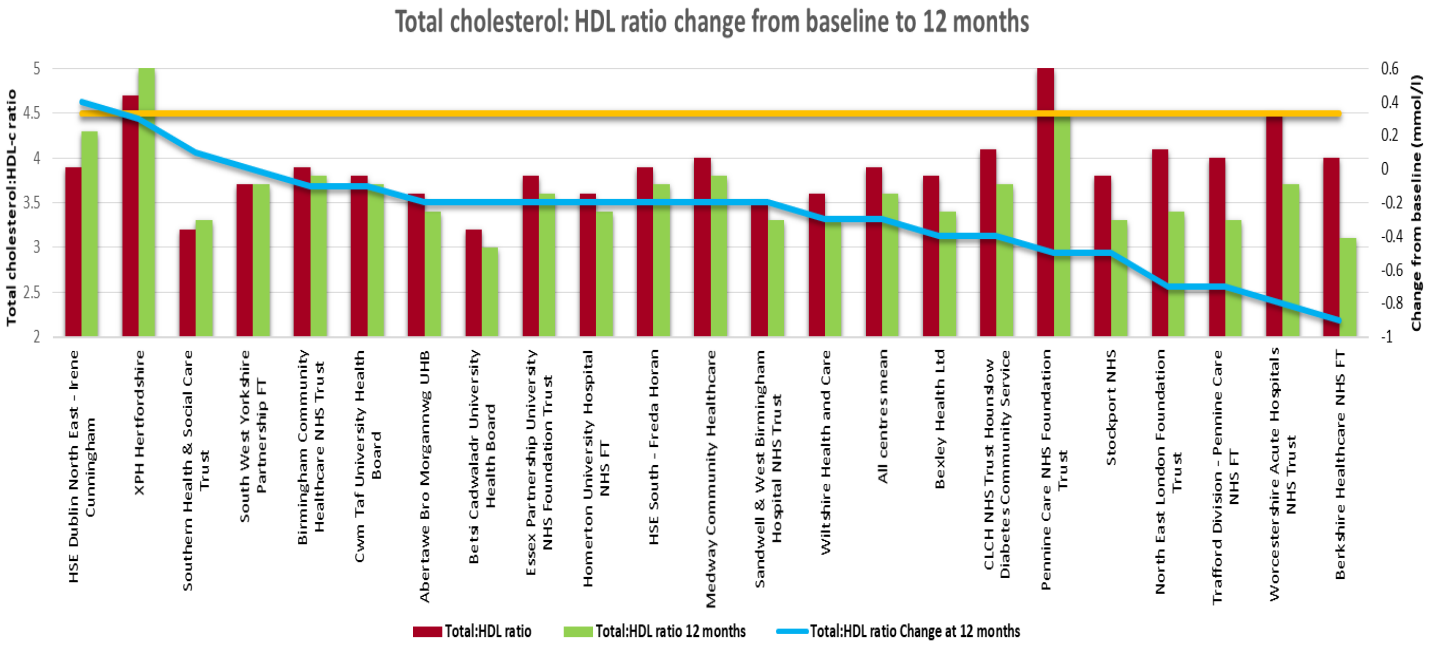
At 12 months the mean *all centre* reduction in diastolic blood pressure for X-PERT participants is 1 mmHg (95% CI: -1, -1) from 77 to 76 mmHg. Twenty organisations reported diastolic blood pressure at 12 months and 11 organisations (55%) demonstrated a mean reduction of between 1 and 10 mmHg (blue line and right-hand axis in the graph above). North East London Foundation Trust achieved the best results with a mean reduction of 10 mmHg (95% CI: -18. -2), however, as with the results from systolic blood pressure at 6 months, only five matched data sets were available.

Total cholesterol to HDL cholesterol ratio

A high total cholesterol to high-density lipoprotein (HDL) cholesterol ratio has been identified as the best predictor of cardiovascular risk. Total cholesterol to HDL ratio can easily be calculated by dividing your total cholesterol level by your HDL. Ideally it should be below 4.5, as a higher ratio increases your risk of heart disease. Above six is regarded as representing a high risk of heart disease. Where organisations have entered total cholesterol and HDL cholesterol at 6 and 12 months, the ratio has been automatically calculated.



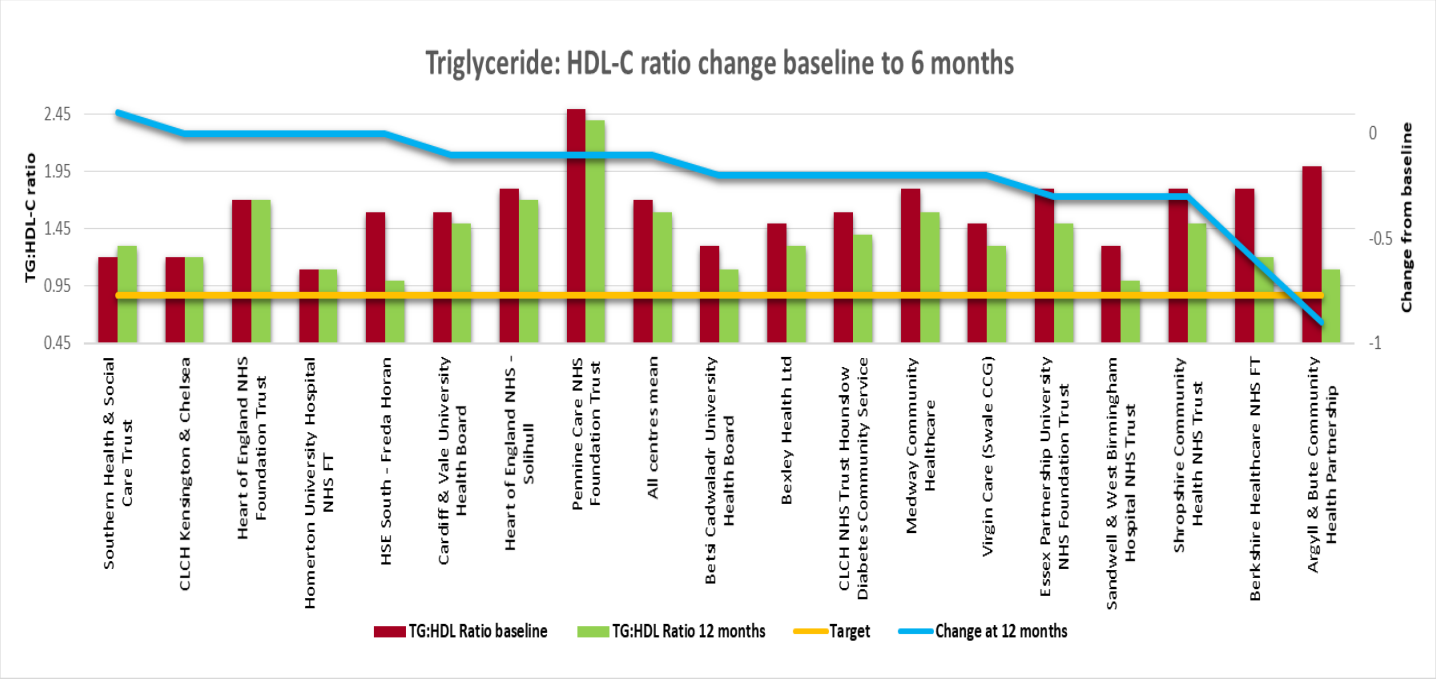
At 6 months the mean *all centre* reduction in total cholesterol to HDL cholesterol ratio is 0.3 (95% CI: -0.5, -0.1) from 4.0 to 3.7. Total cholesterol to HDL cholesterol ratio was calculated for 20 organisations and 16 (80%) demonstrated a reduction between 0.1 and 1.1 mmol/l (blue line and right-hand axis in the graph above). The baseline figures demonstrate that 19 organisations (95%) have a total cholesterol to HDL cholesterol ratio below or equal to our target of 4.5. Argyll & Bute Community Health Partnership achieved the greatest results with a 24% mean reduction of 1.1 (95% CI: -2.36, 0.16), but the confidence intervals suggested that the data were not robust.



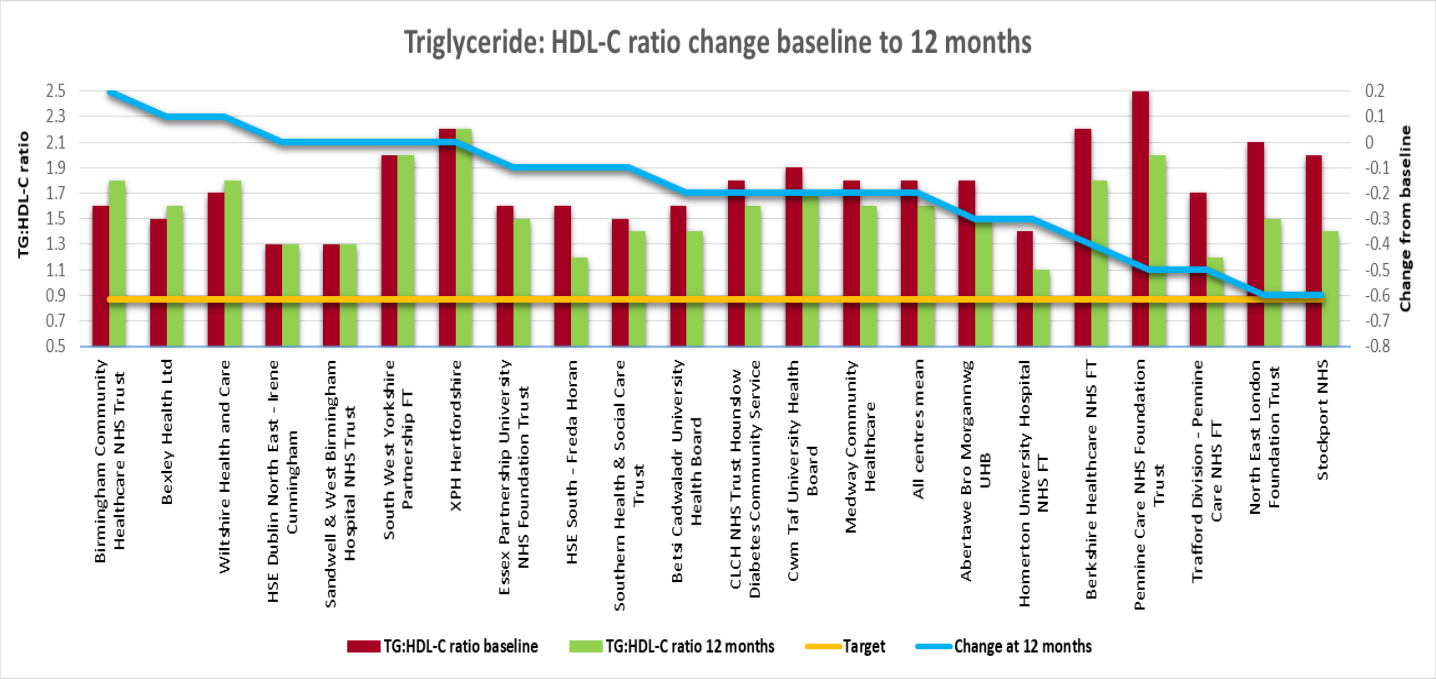
At 12 months the mean *all centre* reduction in total cholesterol to HDL cholesterol ratio for X-PERT participants is 0.3 (95% CI: -0.4, -0.2) from 3.9 to 3.6. Twenty-two organisations entered data for total cholesterol and HDL cholesterol to enable the ratio to be calculated. Fourteen organisations (64%) demonstrated a mean ratio reduction of between 0.1 and 0.5 (blue line and axis on the right side in the graph above). Berkshire Healthcare NHS FT achieved the best results with a 23% mean reduction of 0.9 (95% CI: -1.3, -0.5) from 4.0 to 3.1.

Triglyceride to HDL cholesterol ratio

Many studies have found that the triglyceride to HDL cholesterol ratio (TG:HDL-C ratio) correlates strongly with the incidence and extent of CVD. This relationship is true both for men and women. The ideal ratio is <0.87.



At six months the mean *all centre* reduction in TG:HDL-C ratio is 0.1 from 1.7 to 1.6, however the confidence intervals suggested that this data were not robust (CI 95%: -0.3, 0.1). Eighteen organisations provided triglyceride and HDL-C results at 6 months to enable the ratio to be calculated. Thirteen organisations (72%) demonstrated a reduction in the TG:HDL-C ratio of between 0.1 and 0.9 (blue line and axis on the right-hand (side in the graph above). However, the mean ratio for all organisations remains above target suggesting an elevated risk of CVD. Argyll & Bute Community Health Partnership achieved the best result with a mean 0.9 reduction from 2.0 to 1.1 (95% CI: -1.5, -0.3), however there were only matched data for six participants.



At 12 months the mean *all centre* reduction in TG:HDL-C ratio is 0.2 (95% CI: -0.3, -0.1), from 1.8 to 1.6. Twenty-one organisations provided triglyceride and HDL-C results at 12 months to enable the ratio to be calculated. Fourteen organisations (67%) demonstrated a reduction in the TG:HDL-C ratio of between 0.1 and 0.6 (blue line and axis on the right-hand side in the graph above). However, the mean ratio for all organisations remains above target suggesting increased risk of CVD. Stockport NHS obtained the best results with a mean reduction of 0.6 (95% CI: -0.9, -0.3) reducing the ratio from 2.0 to 1.4.

Discussion

The evidence base demonstrating the success of the X-PERT Programme has already been established from the randomised controlled trial. The purpose of the audit is to benchmark the results from implementation against the published evidence base to determine whether national implementation is as effective as the clinical trial.

This year's results are encouraging and demonstrate that implementation of the X-PERT Programme continues to be effective. Audit standards from the RCT have been met for the mean *all centre data,* except for uptake (attendance at 1 session), which fell short of the 95% target, and waist circumference, which fell short of the ≥ 2cm reduction target. This indicates that more work is required to support participants in attending the first session and to support lifestyle changes to further reduce waist circumference. Most organisations continue to demonstrate an improvement in glycaemic control and the majority are also still demonstrating clinically meaningful improvements to body weight, blood pressure and lipid outcomes by 12 months. Only matched participant data has been used in the current audit.

Limitations

On-going audit does not have the same meticulous rules and regulations as collecting data in a randomised controlled trial. The latter is collected within a specific pre-determined timescale and due care and attention ensures that data is collected from all participants by researchers blinded to the intervention/control groups.

Audit is therefore much more pragmatic and easier to implement. Although it is still open to bias, it is less so now that matched participant data is used. Some organisations have only entered baseline results and therefore no comparative analysis can be undertaken for clinical outcomes. Other organisations have not entered sufficient 6 or 12 month follow-up data, meaning that the number of matched data sets is often limited. As data was discounted from the audit report if less than five matched data sets had been entered for

any one outcome, some organisations were excluded from the audit; in previous years these organisations may have been included based on their un-matched data.

Many organisations are obtaining excellent results whilst others are struggling to meet the audit standards for some outcomes. Some organisations have obstacles in obtaining or entering the data. Educators need to scrutinise less favourable results to ascertain whether it is due to the small sample sizes at follow-up or due to programme delivery. Data needs to be checked for unrealistic or inaccurate results during data entry. This audit report should help to identify priorities for continuous quality improvement within organisations and X-PERT Health are happy to help and assist with this process.

Annual awards

The X-PERT Health awards recognise best practice on an annual basis. There are four categories where awards are presented to organisations who have obtained the best audit results for the following outcomes:

- The best participant experience
- The greatest improvement in glycated haemoglobin
- The largest impact on body weight and waist circumference
- The greatest improvement in cardiovascular disease risk factors (lipids and BP)

The winners were announced at the award ceremony on Thursday 20th September 2018 at the Marriott Renaissance City Centre Hotel, Manchester.

Winners for each category

1) The best participant experience

The following criteria were taken into consideration: number of programmes delivered; number of participants per session; uptake (% attending at least one session); attendance (% attending four or more sessions); participant empowerment change and participant satisfaction.

- Winner: Cwm Taf University Health Board
- 2nd place: Wiltshire Health and Care
- 3rd place: Pennine Care NHS Foundation Trust

2) The greatest improvement in glycated haemoglobin

The following criteria were taken into consideration: HbA1c reduction at 6 months & 12 months; number of matched participants' data (baseline, plus 6 and/or 12 months); acceptable 95% confidence intervals.

- Winner: Medway Community Healthcare Trust
- 2nd place: Berkshire Healthcare NHS Foundation Trust
- 3rd place: CLCH NHS Trust – Hounslow Diabetes Community Service

3) The largest impact on body weight and waist circumference

The following criteria were considered: body weight and waist circumference reduction (6 and 12 months); number of matched participants' data (baseline, plus 6 and/or 12 months).

- Winner: Berkshire Healthcare NHS Foundation Trust
- 2nd place: Essex Partnership University NHS Foundation Trust
- 3rd place: Medway Community Healthcare
- Highly commended for 12 month data: Stockport NHS
- Highly commended for weight loss data at 6 and 12 months: Trafford Division – Pennine Care NHS FT

4) The greatest improvement in cardiovascular disease risk factors (lipids and BP)

The following criteria were taken into consideration: reduction in total to HDL cholesterol ratio, reduction in triglyceride to HDL ratio and reduction in blood pressure (systolic/diastolic) at 6 and 12 months; number of matched participants' data (baseline, plus 6 and/or 12 months).

- Winner: Bexley Health Ltd
- 2nd place: Berkshire Healthcare NHS FT
- 3rd place: Trafford Division – Pennine Care NHS FT
- Highly commended for blood lipid reductions at 6 months: Argyll & Bute Community Healthcare Partnership

The X-PERT "Best Educator" award 2018

Nominations were requested from peers at organisations, they were scored anonymously based on educator impact and achievements. The following criteria were also taken into consideration from the audit data: participant satisfaction; increased empowerment; decreased weight; decreased HbA1c, acceptable 95% confidence intervals.

- **Winner: Anna Begum – Barts Health NHS Trust**

  Between 2016-2017, Anna delivered 39 programmes to 425 patients. She delivered these in both English & Bengali, which takes great skill in order to accurately translate the content of X-PERT, and has achieved a 68.9% completion rate (patients attended 4 or more sessions) during this period. Participants have reported a 95% mean satisfaction score following courses led by Anna and her skill and experience in delivering has translated into a 44.7% mean increase in patient empowerment by the end of her courses. She has achieved good clinical improvements in weight (reduction of 1.8kg, 95% CI: -2.2, -1.4) and HbA1c (reduction of 9.8mmol/mol, 95% CI: -10.2, -9.4) at one year post course.

- **2nd place: Mohammed Uddin – Barts Health NHS Trust**

  Mohammed has delivered 34 programmes between 2016 and 2017. He has delivered these in both English and Bengali to 355 participants; this takes a lot of skill and additional time in order to translate the sessions and accurately convey the content to patients. 75% of his participants complete the course (i.e. attended 4 or more sessions) and these participants have recorded a 64% increase in empowerment at 6 weeks; an excellent achievement. Mohammed has achieved a fantastic mean evaluation score of 97.4% during this time and has been commended for his support and ability to build good rapport with harder-to-reach groups. His hard work and delivery of the course has translated into excellent clinical improvements, including a reduction in mean HbA1c of 12.1 mmol/mol (95% CI: -12.6, -11.6) and a reduction in mean BMI of 1 kg/m^2 (95% CI: -1.2, -0.8) at one year post course.

Conclusion

The results from the comprehensive audit of X-PERT implementation have demonstrated that it is feasible and practical to continue to evaluate the effectiveness of structured education outside a clinical research trial. Although the results of an audit are not as valid and robust as those published from a randomised controlled trial, the number of participants is greater and it is more of a true reflection of real-life practice. Audit standards from the RCT have been met for *all centre* data except uptake (attendance at 1 session), which fell short of the 95% target, and waist circumference, which fell short of the ≥ 2cm reduction target. Therefore, more attention could be given to lifestyle changes to lower waist circumference and improving uptake for structured education. Where possible, organisations experiencing poor uptake or attendance should contact participants to investigate the reason for the poor attendance and how it could be improved.

Overall, results demonstrate that national implementation of the X-PERT Programme in the prevention and management of diabetes equips people with the skills to make informed decisions and take control of their condition, leading to improved health and quality of life. The audit will continue to be repeated annually.

X-PERT Health is happy to advise and support organisations in achieving audit standards and improving key performance indicators, please contact admin@xperthealth.org.uk. Attending X-PERT Educator Update Conferences will help to share good practice to further drive quality improvement.

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