X-PERT Audit Results

2020

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Introduction

At X-PERT Health, our aim is to provide members of the public and healthcare professional with effective education that helps prevent or manage diabetes and other long-term health conditions associated with obesity. A person with diabetes spends, on average, only a few hours with a healthcare professional every year. For the remaining 8,757 hours they have to manage their condition themselves. Structured education is therefore an integral part of care to help people self-manage or prevent long-term health conditions by giving them the skills, knowledge and confidence in order to do so.

Current guidelines recommend that every person with diabetes and/or their carer and those eligible for a lifestyle weight management service should be offered well-designed and well-implemented education. Whilst there has been an increase in the number of people offered education in recent years, nationwide attendance is still low. An improvement in attendance, engagement, and support of diabetes and lifestyle weight management education for adults is needed as they have been shown to:

- improve day-to-day self-management, which affects quality of life and engagement with care
- improve clinical markers such as body weight, blood glucose, blood pressure and blood lipid profile
- reduce the risk of developing other long-term health conditions and serious complications

X-PERT Health has developed a range of structured education programmes that meet nationally agreed criteria (NICE 2016/SIGN 2017). The X-PERT Diabetes programme has been shown to be effective in improving health and quality of life outcomes in people with newly diagnosed and existing diabetes both in a randomised controlled trial (RCT) and in routine national implementation (Deakin et al, 2006 & 2011). The X-PERT Insulin, X-PERT Weight and X-PERT Diabetes Digital programmes were developed following the successes of this programme.

Self-management programmes have also been investigated and have shown to be the most cost effective, with one quality-adjusted life-year (QALY) gained costing less than €20,000 for the X-PERT Diabetes programme (Jacobs-Van Der Bruggen, 2009).

Audit and reporting outcomes is specified in current guidance for implementing diabetes and lifestyle education. The X-PERT audit database was developed so that organisations can audit implementation against audit standards, which are based on the outcomes of the X-PERT RCT and national targets (see page 3), and can compare their effectiveness to the all centres mean. It is crucial to assess whether implementation of the X-PERT programmes result in the improvement to health and wellbeing that was seen in the published clinical trial.

There were 70 organisations registered on the national X-PERT audit database for 2018-2019. Sixty-one of these organisations (87%) entered sufficient data to be included in the 2020 national audit report.

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 per programme	----------	Structured education should be offered to every person and/or their carer at diagnosis. The audit standard is to deliver to at least 1,000 participants per year.
Participant attendance	≥ 95% attend at least one session ≥ 80% completer	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.
Participant satisfaction	≥ 90%	NICE Quality Statements 2 & 3, Outcome: "patient satisfaction with ability to self-manage their diabetes after attending a structured education programme".
Participant empowerment	≥ 10% increase from baseline	NICE Quality Standard for adults with diabetes.
Glycated haemoglobin	≥ 4 mmol/mol reduction at six months and ≥ 6 mmol/mol reduction at 12 months	< 48 mmol/mol normoglycaemia < 53 mmol/mol good diabetes control < 58 mmol/mol QOF target
Outcome	**Audit standard from RCT**	**Audit standard from national target**
Body weight / BMI	No increase	4 kg 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.	----------

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 outcomes have remained consistent for several years. All audit standards from the RCT have been met for the full data set, except for waist circumference, which fell slightly short of the ≥ 2 cm reduction target, and uptake (percentage who attended ≥ 1 session), which fell short of the 95% target at 83.3%.

N.B. This report includes matched participant data, i.e. data is only included for each variable for participants who had the relevant data recorded at baseline ***and*** *the stated post-programme time point. The six and 12 month results are not necessarily based on data from the same participants.*

X-PERT Programmes Report: All Localities (matched)- All Course Types- 01 Sep 2005 to 25 Oct 2020

Number of X-PERT programmes run in this period	13,105	
Total number participants registered	142,085	
Total number who attended 1 session	115,557	
Total percentage who attended 1 session	81.3%	
Total number who attended 4 or more sessions	92,294	
Total percentage who attended 4 or more sessions	79.9%	
Mean number of attendees per programme	8	
Attended Annual Update Module	28.6%	
Evaluation	**6 Weeks**	
Mean program evaluation score	94.5%	
No.(%) programmes with evaluation score	8,960 (68.4%)	
Empowerment	**Baseline:**	**6 Weeks:**
Participant Empowerment Score (1-5)	4.0	4.85
Participant Empowerment Score % Change		21.6%
No. (%) programmes with empowerment scores	8,517 (65%)	8,431 (64.3%)

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)	87.4	19.9	-2.0	-2.1, -1.9	85.9	20.0	-2.1	-2.1, -2.0
BMI (Kg/m²)	30.9	6.3	-0.7	-0.7, -0.7	30.6	6.2	-0.7	-0.7, -0.7
Waist Circumference (cm)	102.0	15.0	-1.6	-1.7, -1.5	102.7	14.5	-1.5	-1.6, -1.4
HbA1c (mmol/mol)	54.5	14.9	-7.0	-7.0, -7.0	55.0	15.0	-6.8	-6.8, -6.8
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
Systolic Blood Pressure (mmHg)	132	14	-2	-2, -2	131	14	-2	-2, -2
Diastolic Blood Pressure (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	0.9	-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	1.4	-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	1.2	-0.2	-0.2, -0.2	1.5	1.4	-0.2	-0.2, -0.2

All centres mean results: 1st January 2018 to 31st December 2019

X-PERT Programmes Report: All Localities (matched)- X-PERT Diabetes 01 Jan 2018 to 31 Dec 2019

Number of X-PERT programmes run in this period:	2,327	
Total number registered:	32,759	
Total number who attended 1 session:	24,249	
Total percentage who attended 1 session:	74%	
Total number who attended 4 or more sessions:	18,529	
Total percentage who attended ≥ 4 sessions:	76.4%	
Mean number of attendees per programme:	10	
Attended Annual Update Module:	2.9%	
Evaluation	**6 Weeks**	
Mean program evaluation score	96.4%	
No.(%) programmes With evaluation score	1,919 (82.5%)	
Empowerment	**Baseline**	**6 Weeks**
Participant Empowerment Score (1-5)	4.0	5.0
Participant Empowerment Score % Change		20.7%
No. (%) programmes With empowerment scores	1,924 (82.7%)	1,913 (82.2%)

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)	85.2	19.6	-3.1	-3.3, -2.9	84.5	19.7	-2.5	-2.7, -2.3
BMI (Kg/m2)	29.9	6.0	-1.1	-1.2, -1.0	30.2	6.3	-0.9	-1.0, -0.8
Waist Circumference (cm)	102.1	13.0	-2.2	-2.4, -2.0	99.4	13.3	-3.2	-3.5, -2.9
HbA1c (mmol/mol)	53.7	14.1	-9.4	-9.5, -9.3	54.9	15.2	-7.7	-7.8, -7.6
Fasting Blood Glucose (mmol/l)	7.0	2.6	-1.3	-1.5, -1.1	6.9	2.6	-1.1	-1.3, -0.8
Systolic Blood Pressure (mmHg)	130	13	-2	-2, -2	130	13	-2	-2, -2
Diastolic Blood Pressure (mmHg)	76	9	-2	-2, -2	76	8	-2	-2, -2
Total Cholesterol (mmol/l)	4.2	1.1	-0.4	-0.4, -0.4	4.2	1.1	-0.3	-0.3, -0.3
LDL Cholesterol (mmol/l)	2.3	1.0	-0.3	-0.3, -0.3	2.2	0.9	-0.3	-0.4, -0.2
HDL Cholesterol (mmol/l)	1.3	0.4	0.0	0.0, 0.0	1.3	0.4	0.0	0.0, 0.0
Non HDL Cholesterol (mmol/l)	3.0	1.1	-0.3	-0.3, -0.3	2.9	1.0	-0.3	-0.3, -0.3
Total Cholesterol to HDL Ratio	3.6	1.1	-0.3	-0.3, -0.3	3.5	1.1	-0.4	-0.4, -0.4
Triglycerides (mmol/l)	1.7	1.1	-0.3	-0.4, -0.2	1.8	1.0	-0.2	-0.3, -0.1
Triglycerides to HDL Ratio	1.6	1.3	-0.3	-0.4, -0.2	1.6	1.1	-0.2	-0.3, -0.1

Comparison with the full data set and the 2019 audit

A greater emphasis on structured education means that 23% (n=32,759) of the total number of participants (142,085) registered on the audit database have been invited to attend the X-PERT Programme between 1st January 2018 and 31st December 2019. Of these, the percentage of people taking up the opportunity to attend is 74%, which is lower than the full mean data set score of 81.3%. There is variation between organisations with some having a much better uptake than others. The number of people completing the programme has slightly decreased since the 2019 Audit Report 78% to 76.4%, but the evaluation score has remained the same at 96.4% and the increase in empowerment has also remained the same at 21%. The mean number of participants per programme has remained the same at 10 although variation exists between organisations.

Matched participant data shows that, between 2018 and 2019, X-PERT Programme implementation has resulted in a mean weight loss of 3.1kg (six months) and 2.5kg (12 months) for X-PERT Diabetes. This is similar to the year before but greater than the full mean data set for six months (-2.0kg) and 12 months (-2.1kg), respectively. 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. This is the first audit for the X-PERT Weight Programme and the mean reduction in weight is 4.9kg at 12 weeks.

A mean reduction in HbA1c values from baseline is evident at both six months (-9.4mmol/mol) and 12 months (-7.7mmol/mol). This is a similar reduction to the 2019 audit but an improvement on the full mean data set at both six months (-7.0mmol/mol) and 12 months (-6.8mmol/mol).

Comparison of individual organisation outcomes 1st January 2018 to 31st December 2019

The 2020 awards are for matched participant data entered between 1st January 2018 and 31st December 2019. The mean value for each outcome has been compared between organisations. Data was only included if there was at least one set of matched participant data (N.B. "matched data" means that a clinical indicator had been recorded for a patient at both baseline and post programme). As some participants had data recorded at baseline and six months and others at baseline and 12 months, the time points include different patients and are therefore not comparable. The number of matched sets was taken into consideration for each health outcome award, i.e. outcomes were given greater weighting where they are based on a larger number of participants.

Organisations and abbreviations

Below is a table of the organisations and/or freelance educators who are registered on the X-PERT Audit Database. Organisation names have been abbreviated so that they clearly display on the graphs.

Organisations highlighted in orange have not entered any data onto the audit database between 1st January 2018 and 31st December 2019 and were therefore not included in the audit.

OFFICIAL NAME	ABBREVIATED
ANEURIN BEVAN UNIVERSITY HEALTH BOARD – CAERPHILLY	ABUHB - Caerphilly
ANEURIN BEVAN UNIVERSITY HEALTH BOARD – MONMOUTHSHIRE	ABUHB - Monmouthshire
ANEURIN BEVAN UNIVERSITY HEALTH BOARD – NEWPORT	ABUHB - Newport
ANEURIN BEVAN UNIVERSITY HEALTH BOARD – TORFAEN	ABUHB - Torfaen
AIREDALE, WHARFEDALE & CRAVEN CCG	Airedale, Wharfedale & Craven
ARGYLL & BUTE COMMUNITY HEALTH PARTNERSHIP	Argyll & Bute
BARNSLEY HOSPITAL NHS FT	Barnsley
BARTS HEALTH NHS TRUST	Barts - London
BERKSHIRE HEALTHCARE NHS FT	Berkshire Healthcare
BETSI CADWALADR UNIVERSITY HEALTH BOARD	Betsi Cadwaladr
BEXLEY HEALTH NEIGHBOURHOOD CARE CIC	Bexley Health
BIRMINGHAM COMMUNITY HEALTHCARE - E&N	Birmingham - E&N
BIRMINGHAM COMMUNITY HEALTHCARE - HEART OF BIRMINGHAM	Heart of Birmingham
BLACKTHORN TRUST	Blackthorn Trust
CARDIFF & VALE UNIVERSITY HEALTH BOARD	Cardiff & Vale
CHANGING HEALTH	Changing Health
CLCH HAMMERSMITH & FULHAM	Hammersmith & Fulham
CLCH KENSINGTON & CHELSEA	Kensington & Chelsea
CLCH WESTMINSTER	Westminster
CRAWLEY	Crawley
CWM TAF MORGANNWG UNIVERSITY HEALTH BOARD	Cwm Taf Morgannwg
DOVETAIL	Dovetail
DERBYSHIRE COMMUNITY HEALTH SERVICES - EREWASH CCG	Erewash
DERBYSHIRE COMMUNITY HEALTH SERVICES - SOUTH DERBYSHIRE CCG	South Derbyshire
DUDLEY GROUP NHS FOUNDATION TRUST	Dudley
DURHAM & DARLINGTON NHS FOUNDATION TRUST	Durham & Darlington
ESSEX PARTNERSHIP UNIVERSITY NHS FOUNDATION TRUST	Essex
FRANK KUHNE	Frank Kuhne
GLORIA SIMON	Gloria Simon
HARROW NHS	Harrow
HELEN CHAUHAN	Helen Chauhan
HOMERTON UNIVERSITY HOSPITAL TRUST	Homerton

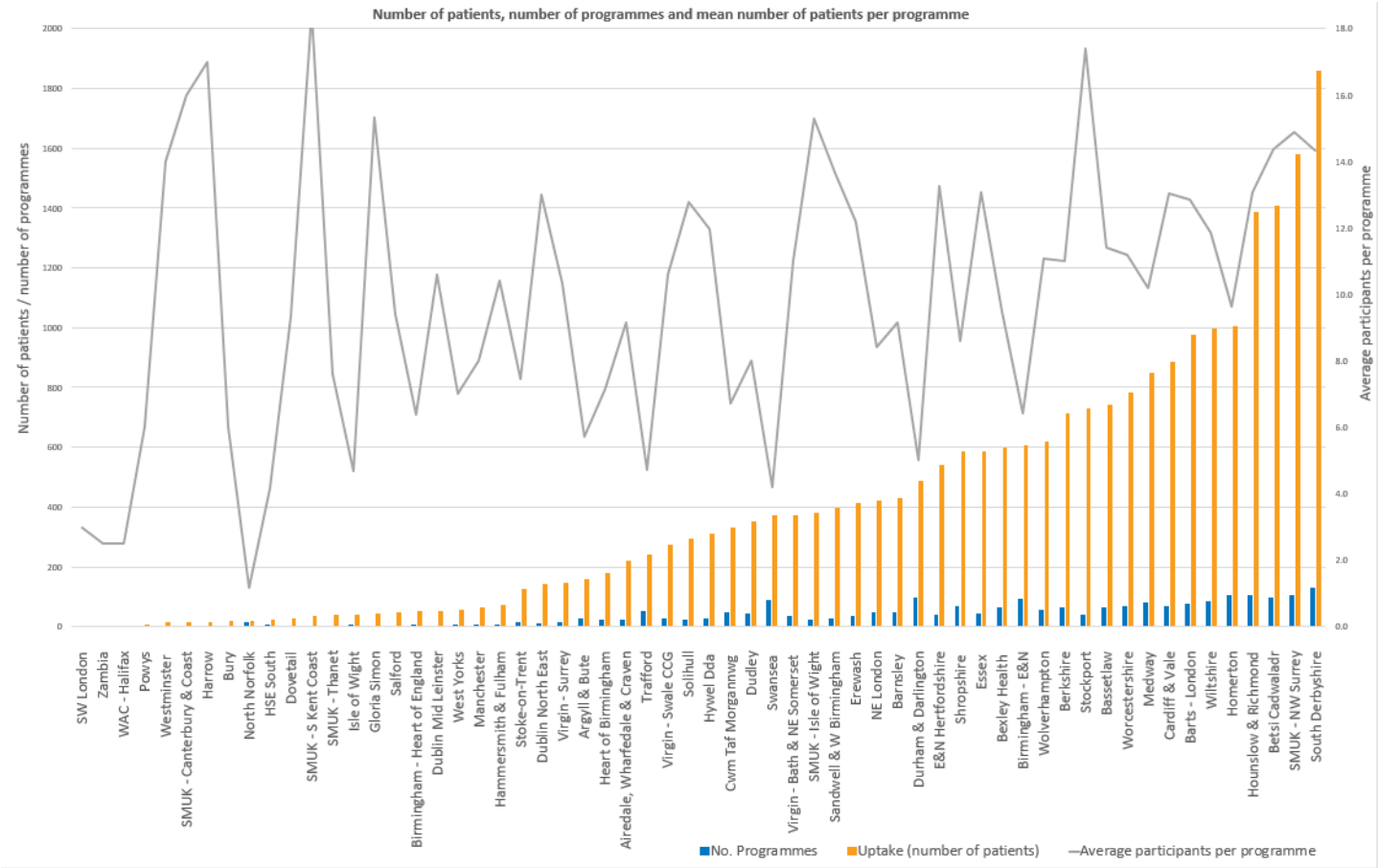
HOUNSLOW AND RICHMOND COMMUNITY HEALTHCARE NHS TRUST	Hounslow & Richmond
HSE DUBLIN MID LEINSTER	Dublin Mid Leinster
HSE DUBLIN NORTH EAST	Dublin North East
HSE SOUTH	HSE South
HYWEL DDA UNIVERSITY HEALTH BOARD	Hywel Dda
ICS - NORTH NORFOLK	North Norfolk
ISLE OF WIGHT NHS TRUST	Isle of Wight
ZAMBIA	Zambia
MANCHESTER NHS FT	Manchester
MEDWAY COMMUNITY HEALTHCARE	Medway
NORTH EAST LONDON FOUNDATION TRUST	North East London
NOTTINGHAMSHIRE HEALTHCARE NHS FT - NHS BASSETLAW CCG	Bassetlaw
PENNINE CARE NHS FOUNDATION TRUST – BURY	Bury
PENNINE CARE NHS FOUNDATION TRUST - TRAFFORD DIVISION	Trafford
POWYS TEACHING HEALTH BOARD	Powys
SALFORD ROYAL NHS FOUNDATION TRUST	Salford
SANDWELL & WEST BIRMINGHAM HOSPITAL NHS TRUST	Sandwell & West Birmingham
SELF MANAGEMENT UK - CANTERBURY & COAST CCG	SMUK - Canterbury & Coast
SELF MANAGEMENT UK - ISLE OF WIGHT CCG	SMUK - Isle of Wight
SELF MANAGEMENT UK - NORTH WEST SURREY CCG	SM UK - NW Surrey
SELF MANAGEMENT UK - SOUTH KENT COAST	SMUK - South Kent Coast
SELF MANAGEMENT UK - THANET CCG	SMUK - Thanet
SHROPSHIRE COMMUNITY HEALTH NHS TRUST	Shropshire
SOUTH WEST LONDON	SW London
STOCKPORT NHS	Stockport
STOKE-ON-TRENT CITY COUNCIL	Stoke-on-Trent
SWANSEA BAY UNIVERSITY HEALTH BOARD	Swansea
UNIVERSITY HOSPITALS BIRMINGHAM NHS - HEART OF ENGLAND	Birmingham - Heart of England
UNIVERSITY HOSPITALS BIRMINGHAM NHS – SOLIHULL	Solihull
VIRGIN CARE - BATH & NORTH EAST SOMERSET COMMUNITY HEALTH & CARE SERVICES	Virgin - Bath & NE Somerset
VIRGIN CARE - SURREY HEALTH	Virgin - Surrey
VIRGIN CARE - SWALE CCG	Virgin - Swale
WOMEN'S ACTIVITY CENTRE	WAC - Halifax
WILTSHIRE HEALTH AND CARE	Wiltshire
WOLVERHAMPTON WANDERERS FOUNDATION	Wolverhampton
WORCESTERSHIRE ACUTE HOSPITALS NHS TRUST	Worcestershire
X-PERT HEALTH	West Yorkshire
X-PERT HEALTH - E&N HERTFORDSHIRE CCG	E&N Hertfordshire

The best participant experience

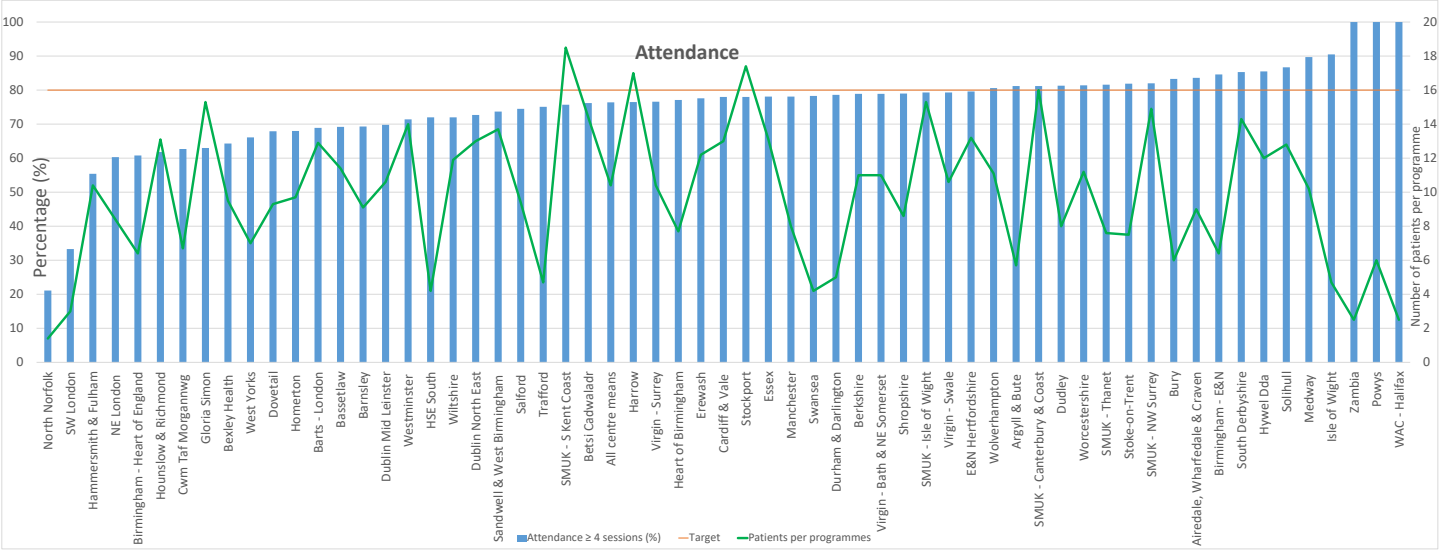
This award looked at the following criteria: number of programmes delivered; number of participants per session; uptake (% attending at least one session); attendance (% attending four or more sessions); participant empowerment change and participant satisfaction.

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

The graph below presents the number of participants per organisation who have attended the X-PERT Programme between 1st January 2017 and 31st December 2018. In total 2,327 X-PERT programmes were delivered with 24,249 participants attending one session. Derbyshire Community Health Services - South Derbyshire CCG delivered the most programmes (n-130) to 1,861 participants with a mean of 14 participants per programme. Self-Management UK – North West Surrey and Betsi Cadwaladr University Health Board had the second and third highest attendee numbers respectively. Self-Management UK - South Kent Coast achieved the greatest mean number of participants per programme (19 participants).



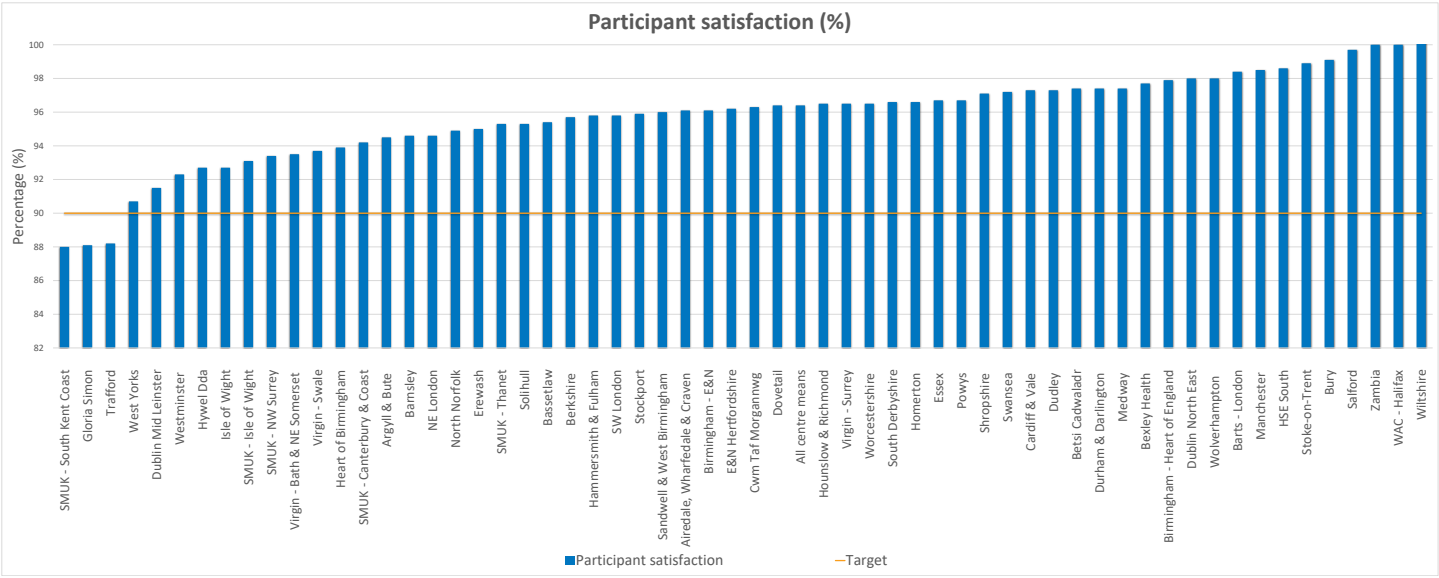
Participant attendance



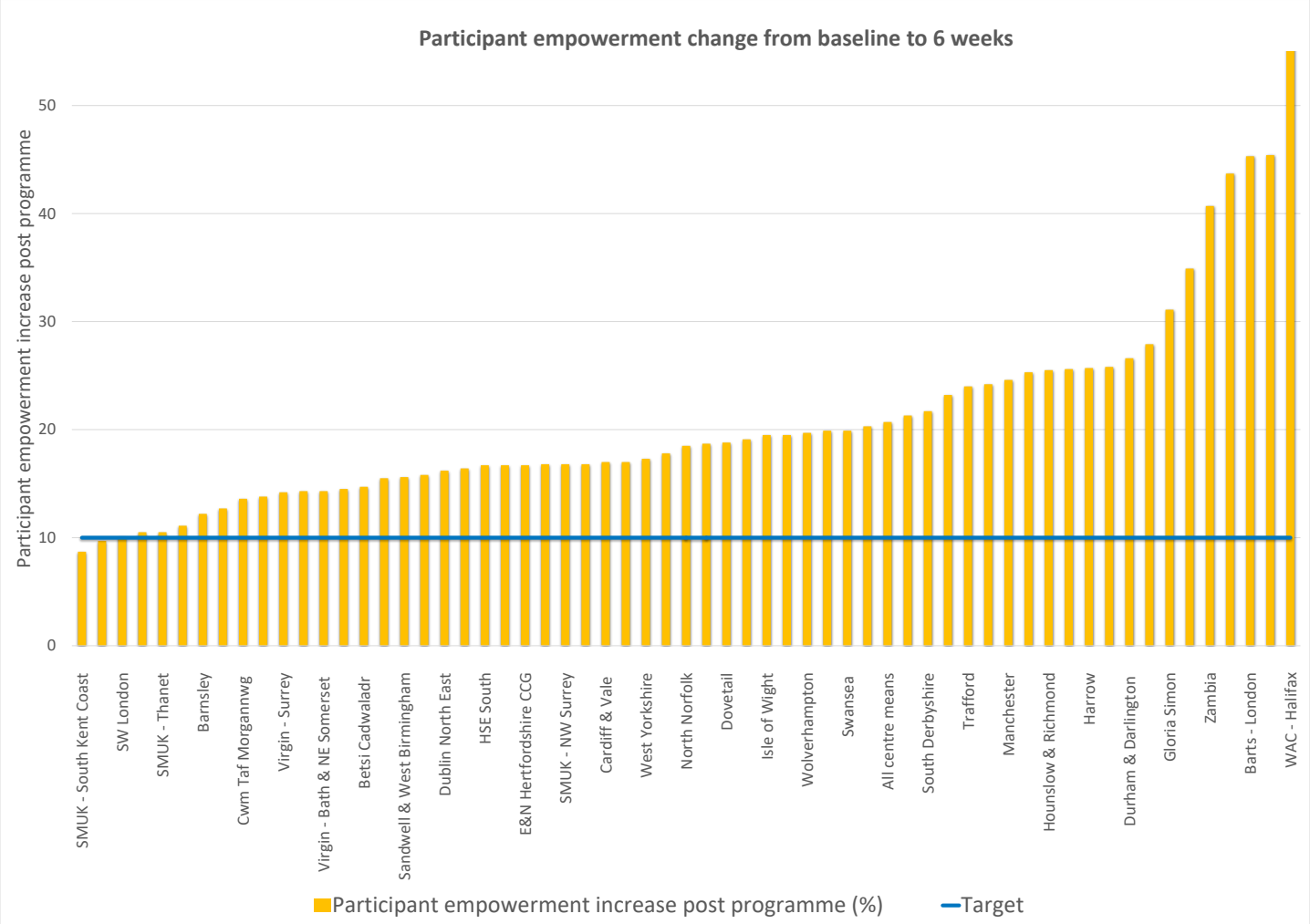
The mean *all centre* attendance score (percentage of X-PERT participants who attended four or more sessions) was 76.4%**.** The audit standard derived from the clinical trial was 80% (orange line in the graph above). Sixty organisations reported attendance and 19 organisations (32%) obtained a mean attendance score equal to or above the audit standard. Reasons for not meeting the audit standard need to be explored to ascertain whether this is due to incomplete data entry or to programme implementation.

Participant satisfaction & empowerment

Participants complete an evaluation questionnaire in Session Six of the X-PERT programme**,** and a validated empowerment questionnaire in Sessions One and Six. Mean scores for satisfaction and empowerment are calculated per programme and entered onto the audit database.



At six weeks the mean *all centre* X-PERT participant satisfaction score is 96.4%**.** The audit standard is 90% (orange line in the graph above)**.** Fifty-seven organisations (97% of 59 organisations who had entered data) achieved the audit standard for participant satisfaction although the lowest satisfaction score was 88%. Zambia, The Women's Activity Centre (Halifax) and Wiltshire achieved 100% participant satisfaction.



The clinical trial demonstrated a 24% increase in participant empowerment at six weeks; the *all centres mean* in the audit is +20.7%. The audit standard for implementation has been set at 10% (see orange line above). Fifty-eight organisations (97% of sixty organisations) exceeded the audit standard for empowerment.

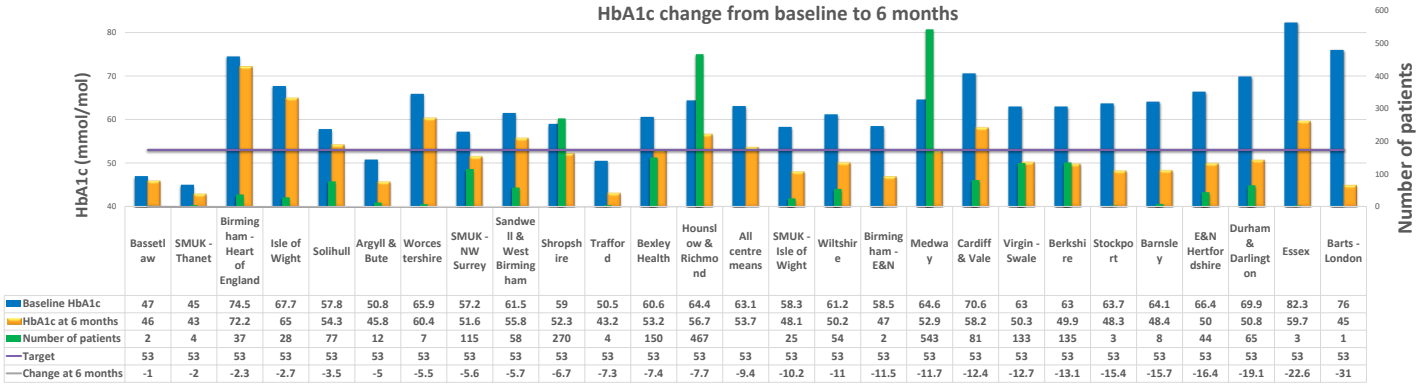
Taking all these criteria into account, the best participant experience award goes to *Derbyshire Community Health Services - South Derbyshire CCG* who delivered 130 programmes to 1,861 participants (mean 14 per programme) with 85.3% completion, a 21.7% increase in empowerment at six weeks, and 96.6% participant satisfaction. *Self-Management UK - North West Surrey CCG* have been awarded 2nd place. They delivered 106 programmes to 1579 participants (mean 15 per programme), achieved 82% completion, a 16.8% increase in empowerment at six weeks, and 93.4% participant satisfaction. 3rd place has been awarded to *Betsi Cadwaladr University Health Board*, who delivered a total of 98

programmes to 1,409 participants (mean 14 per programme) and achieved 76.2% completion, a 14.7% increase in participant empowerment and 97.4% participant satisfaction.

Greatest improvement in glycated haemoglobin

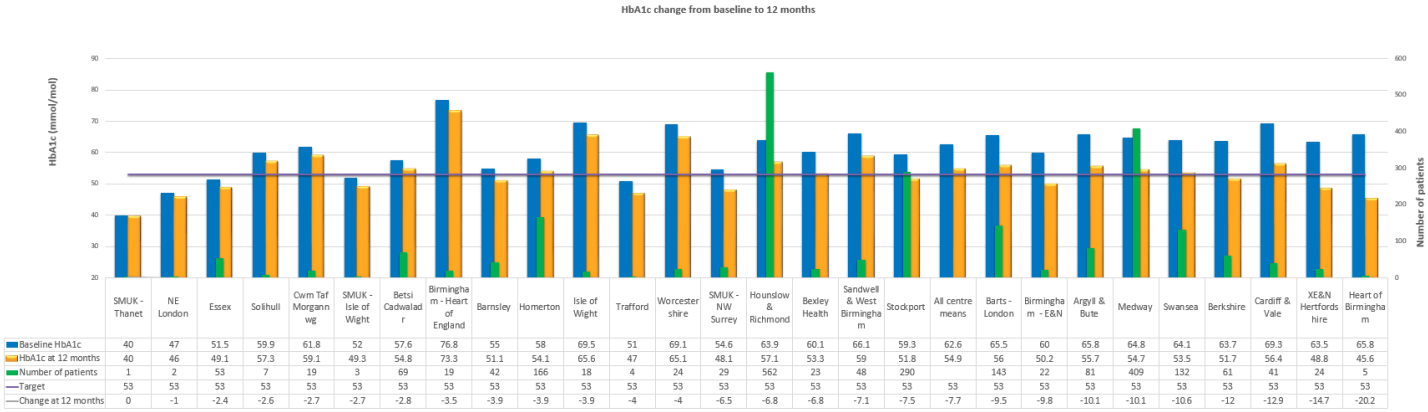
To be considered for an award the following criteria were taken into consideration: HbA1c reduction at both six and 12 months; number of participants for whom matched data had been entered; percentage of attendees that had matched data, robust six and 12 months 95% confidence intervals.

Glycated haemoglobin (HbA1c)



	Bassetlaw	SMUK - Thanet	Birmingham - Heart of England	Isle of Wight	Solihull	Argyll & Bute	Worcestershire	SMUK - NW Surrey	Sandwell & West Birmingham	Shropshire	Trafford	Bexley Health	Hounslow & Richmond	All centre means	SMUK - Isle of Wight	Wiltshire	Birmingham - E&N	Medway	Cardiff & Vale	Virgin - Swale	Berkshire	Stockport	Barnsley	E&N Hertfordshire	Durham & Darlington	Essex	Barts - London
Baseline HbA1c	47	45	74.5	67.7	57.8	50.8	65.9	57.2	61.5	59	50.5	60.6	64.4	63.1	58.3	61.2	58.5	64.6	70.6	63	63	63.7	64.1	66.4	69.9	82.3	76
HbA1c at 6 months	46	43	72.2	65	54.3	45.8	60.4	51.6	55.8	52.3	43.2	53.2	56.7	53.7	48.1	50.2	47	52.9	58.2	50.3	49.9	48.3	48.4	50	50.8	59.7	45
Number of patients	2	4	37	28	77	12	7	115	58	270	4	150	467		25	54	2	543	81	133	135	3	8	44	65	3	1
Target	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53
Change at 6 months	-1	-2	-2.3	-2.7	-3.5	-5	-5.5	-5.6	-5.7	-6.7	-7.3	-7.4	-7.7	-9.4	-10.2	-11	-11.5	-11.7	-12.4	-12.7	-13.1	-15.4	-15.7	-16.4	-19.1	-22.6	-31

At six months the mean *all centre* reduction in glycated haemoglobin for X-PERT participants is 9.4 mmol/mol (95% CI: -9.5, -9.3), to 53.7 mmol/mol. The clinical trial demonstrated a 4 mmol/mol improvement in glycated haemoglobin at four months. The audit standard for both six and 12 months is an HbA1c value of ≤53mmol/mol (the purple line on both graphs). Twenty-six organisations reported HbA1c at six months and 18 organisations (69%) achieved the audit standard for glycated haemoglobin ≤53mmol/mol. All 26 organisations demonstrated a mean reduction in HbA1c. Although Essex Partnership University NHS Foundation Trust and Barts Health NHS Trust reported the greatest reduction in HbA1c (-26.2 and -31 mmol/mol, respectively), this was only for three and one participants, respectively. The most robust data came from Durham & Darlington NHS Foundation Trust who achieved a mean reduction of 19.1 mmol/mol (95% CI: -19.9, -18.4) for 65 participants.



	SMUK - Thanet	NE London	Essex	Solihull	Cwm Taf Morgannwg	SMUK - Isle of Wight	Betsi Cadwaladr	Birmingham - Heart of England	Barnsley	Homerton	Isle of Wight	Trafford	Worcestershire	SMUK - NW Surrey	Hounslow & Richmond	Bexley Health	Sandwell & West Birmingham	Stockport	All centre means	Barts - London	Birmingham - E&N	Argyll & Bute	Medway	Swansea	Berkshire	Cardiff & Vale	XE&N Hertfordshire	Heart of Birmingham
Baseline HbA1c	40	47	51.5	59.9	61.8	52	57.6	76.8	55	58	69.5	51	69.1	54.6	63.9	60.1	66.1	59.3	62.6	65.5	60	65.8	64.8	64.1	63.7	69.3	63.5	65.8
HbA1c at 12 months	40	46	49.1	57.3	59.1	49.3	54.8	73.3	51.1	54.1	65.6	47	65.1	48.1	57.1	53.3	59	51.8	54.9	56	50.2	55.7	54.7	53.5	51.7	56.4	48.8	45.6
Number of patients	1	2	53	7	19	3	69	19	42	166	18	4	24	29	562	23	48	290		143	22	81	409	132	61	41	24	5
Target	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53
Change at 12 months	0	-1	-2.4	-2.6	-2.7	-2.7	-2.8	-3.5	-3.9	-3.9	-3.9	-4	-4	-6.5	-6.8	-6.8	-7.1	-7.5	-7.7	-9.5	-9.8	-10.1	-10.1	-10.6	-12	-12.9	-14.7	-20.2

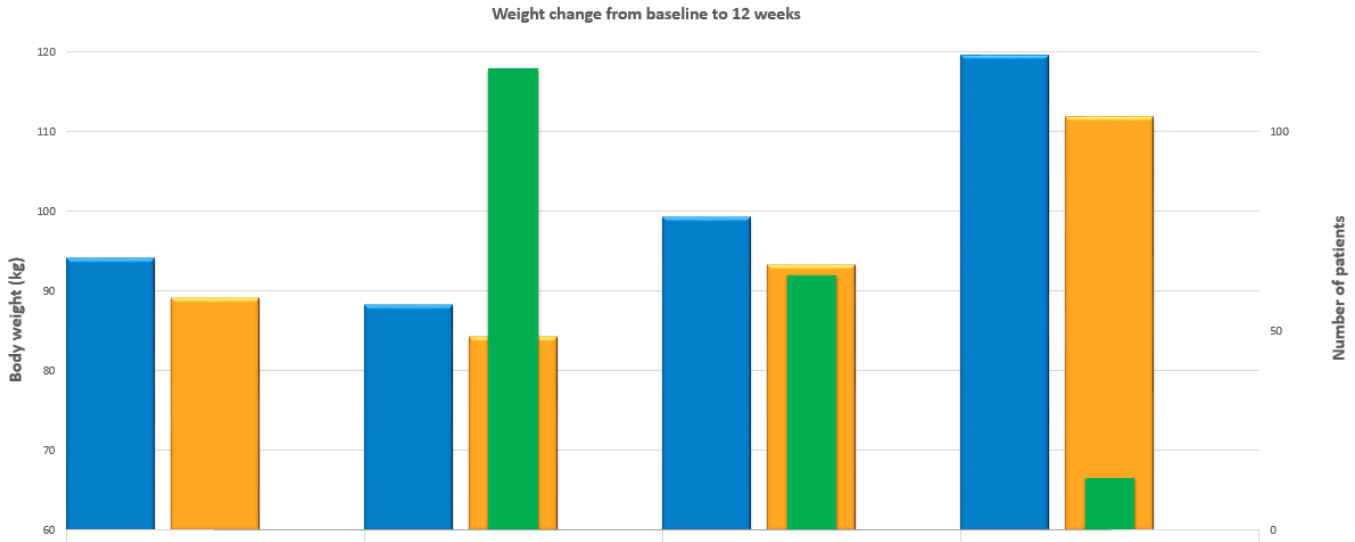
At 12 months the mean *all centre* reduction in glycated haemoglobin is 7.7 mmol/mol reduction, to 54.9 mmol/mol (95% CI: -7.8, -7.6). The clinical trial demonstrated a 7.7 mmol/mol at 12 months. Twenty-seven organisations reported HbA1c at 12 months, all of which demonstrated a mean reduction in HbA1c. Thirteen organisations met the audit standard at 12 months (48%). *Birmingham Community Healthcare - Heart of Birmingham* achieved the greatest reduction at 12 months of 20.2 mmol/mol but only for five participants. Berkshire reported -12 mmol/nmol (95% CI: -12.8,-11.2) for 61 participants; *Cardiff & Vale University Health Board* -12.9 mmol/mol (95% CI: -13.9, -11.9) for 41 participants and *X-PERT Health for East & North Hertfordshire CCG* -14.7 mmol/mol (95% CI: -16.1, -13.3) for 24 participants.

Medway Community Healthcare overall achieved the best results with a mean six and 12 month reduction of -11.7 mmol/mol (95% CI: -12.0, -11.4) in 543 participants and -10.1 mmol/mol (95% CI: -10.4, -9.8) in 409 participants respectively. In second place *Berkshire Healthcare NHS Foundation Trust* achieved the greatest reduction with a 13.1 mmol/mol mean reduction at six months in 135 participants (95% CI: -13.6, -12.6) and a 12.0 mmol/mol mean reduction at 12 month in 61 participants (95% CI: -12.8, -11.2). In third place, *Cardiff & Vale University Health Board* achieved a -12.4 mmol/mol (95% CI: -13.0, -11.8) reduction in HbA1c at six months for 81 participants and an -12.0 mmol/mol reduction at 12 months in 41 participants (95% CI: -12.8, -11.2).

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 12 weeks for the X-PERT Weight Programme and six and 12 months for the X-PERT Diabetes Programme. For all timelines, the number of participants for whom matched data was available and average number of attendees per programme were taken into consideration.

Body weight

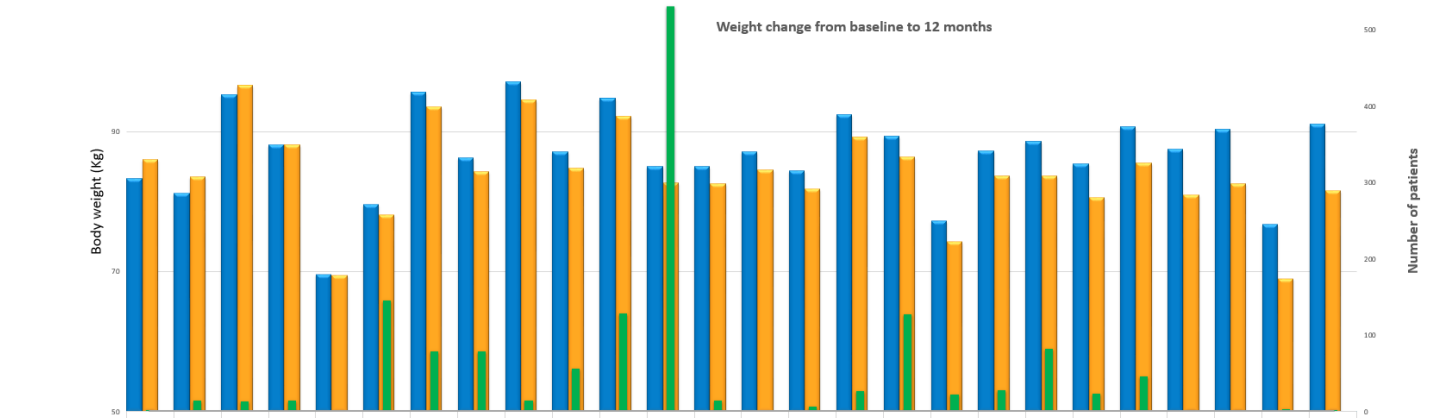


	All centres mean	X-PERT Health	Helen Chauhan	Betsi Cadwaladr
Baseline weight (kg)	94.1	88.3	99.3	119.6
Weight at 12 weeks (kg)	89.2	84.3	93.3	111.9
Change at 12 weeks (kg)	-4.9	-4	-6	-7.7
Number of patients		116	64	13
% change	-5%	-5%	-6%	-6%

In 2018-19, three organisations delivered the X-PERT Weight Programme and entered outcomes into the Audit Database. The mean weight loss across all the organisations was 4.9kg. Betsi Cadwaladr obtain the best results (-7.7kg, 95% CI: -9.6, -5.8) but only for 13 participants, whereas Helen Chauhan in Melbourne, Australia achieved a mean weight loss of 6.0kg (95% CI: -6.8, -5.2) for 64 participants and X-PERT Health -4.0kg (95% CI: -4.5, -3.5) for 116 participants.

	Isle of Wight	Birmingham - Heart of England	Trafford	Sandwell & West Birmingham	Wiltshire	Hounslow & Richmond	Bexley Health	SMUK - Isle of Wight	Shropshire	All centre means	Essex	Solihull	Barts - London	Stockport	Berkshire	SMUK - NW Surrey	Argyll & Bute	Medway	E&N Hertfordshire	SMUK - Thanet	Durham & Darlington
Baseline weight (kg)	81.1	90.8	97.4	86	83.6	84	90.3	92.3	86.8	88.3	108.3	86.8	80.4	98	90.8	84.9	91	96.2	91.9	88	97.4
Weight at 6 months (kg)	81.5	90.7	96.9	85.2	81.4	81.6	87.8	89.6	84.1	85.2	105	83.4	77	94.5	86.9	80.8	86.6	91.8	87	82.6	91.3
Change at 6 months (kg)	0.4	-0.1	-0.5	-0.8	-2.2	-2.4	-2.5	-2.7	-2.7	-3.1	-3.3	-3.4	-3.4	-3.5	-3.9	-4.1	-4.4	-4.4	-4.9	-5.4	-6.1
Number of patients	24	31	4	22	59	420	150	18	87		4	47	1	2	176	93	10	128	40	2	62
% change	0%	0%	-1%	-1%	-3%	-3%	-3%	-3%	-3%	-4%	-3%	-4%	-4%	-4%	-4%	-5%	-5%	-5%	-5%	-6%	-6%

At six months the mean *all centre* reduction in body weight for X-PERT participants was 3.1kg (95% CI: -3.3, -2.9) from 88.3kg to 85.2kg; a 4% weight loss. Twenty organisations entered data for weight at six months and 19 of these organisations (95%) documented a mean weight loss between 0.1kg and 6.1kg. The percentage change from baseline was between 0% and -6%. Durham & Darlington NHS Foundation Trust achieved the best results at six months with a mean weight loss of 6.1kg (95% CI: -7.0, -5.2) for 62 participants.

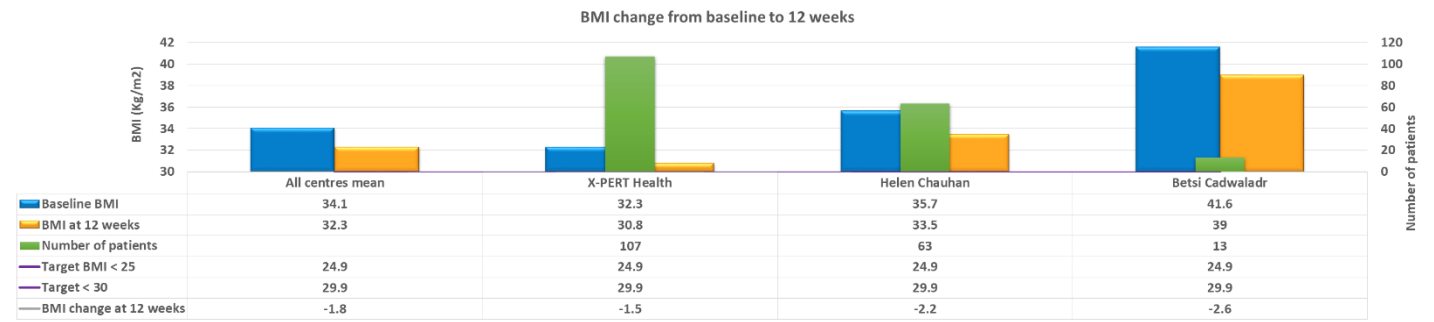


	Heart of Birmingham	Isle of Wight	Birmingham - Heart of England	Birmingham - E&N	Gloria Simon	Barts - London	Argyll & Bute	Betsi Cadwaladr	Sandwell & West Birmingham	Essex	Swansea	Hounslow & Richmond	Cwm Taf Morgannwg	All centre means	Solihull	Bexley Health	Stockport	SMUK - NW Surrey	Homerton	Berkshire	E&N Hertfordshire	Medway	Trafford	SMUK - Thanet	SMUK - Isle of Wight	NE London
Baseline weight (kg)	83.2	81.1	95.2	88.1	69.6	79.5	95.5	86.2	97	87	94.7	85	84.9	87	84.4	92.3	89.3	77.2	87.2	88.5	85.3	90.6	87.4	90.2	76.7	91
Weight at 12 months (kg)	86	83.5	96.5	88.1	69.5	78.1	93.5	84.2	94.5	84.7	92.1	82.6	82.5	84.5	81.8	89.2	86.3	74.3	83.6	83.6	80.5	85.5	80.9	82.5	69	81.5
Change at 12 months (kg)	2.8	2.4	1.3	0	-0.1	-1.4	-2	-2	-2.5	-2.3	-2.6	-2.4	-2.4	-2.5	-2.6	-3.1	-3	-2.9	-3.6	-4.9	-4.8	-5.1	-6.5	-7.7	-7.7	-9.5
Number of patients	2	15	13	14	1	146	79	79	15	56	128	531	14		7	27	127	22	28	82	24	46	2	2	3	2
% change	3%	3%	1%	0%	0%	-2%	-2%	-2%	-3%	-3%	-3%	-3%	-3%	-3%	-3%	-3%	-3%	-4%	-4%	-6%	-6%	-6%	-7%	-9%	-10%	-10%

At 12 months the mean *all centre* reduction in body weight for X-PERT participants was 2.5kg (95% CI: -2.7, -2.3) from 87.0kg to 84.5kg. Twenty-five organisations entered data for weight at 12 months, and 21 (84%) demonstrated a mean

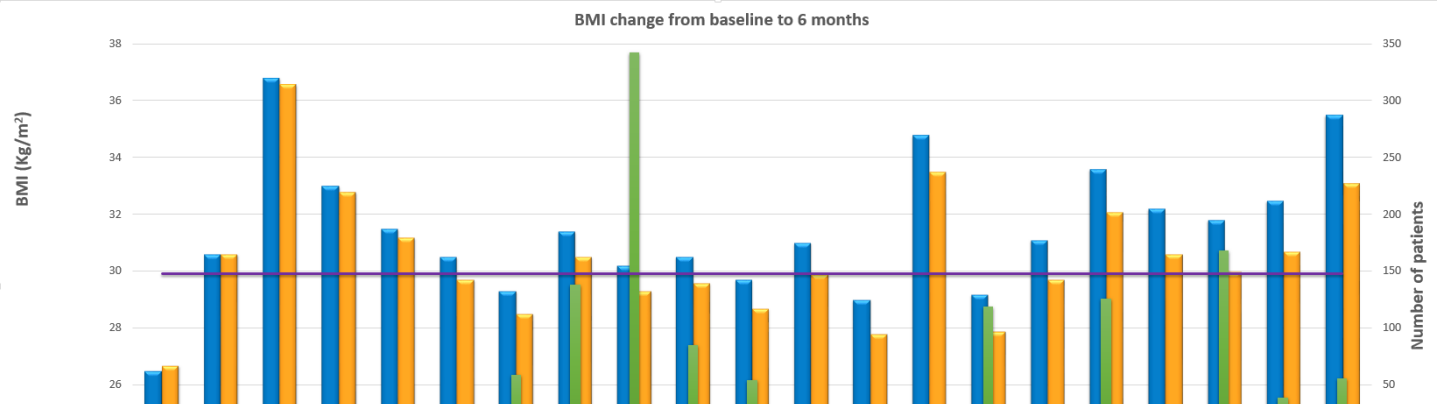
weight reduction between 0.1kg and 9.5kg (0-10%). North East London Foundation Trust achieved the best results at 12 months with a mean weight loss of 9.5kg (95% CI: -14.5, -4.5) but only for 2 participants. Medway Community Healthcare achieved a mean weight loss of 5.1kg (95% CI: -6.0, -4.2) for 46 participants and Berkshire Healthcare NHS Foundation Trust achieved a mean weight loss of 4.9kg (95% CI: -5.5, -4.3) for 82 participants.

Body Mass Index (BMI)



	All centres mean	X-PERT Health	Helen Chauhan	Betsi Cadwaladr
Baseline BMI	34.1	32.3	35.7	41.6
BMI at 12 weeks	32.3	30.8	33.5	39
Number of patients		107	63	13
Target BMI < 25	24.9	24.9	24.9	24.9
Target < 30	29.9	29.9	29.9	29.9
BMI change at 12 weeks	-1.8	-1.5	-2.2	-2.6

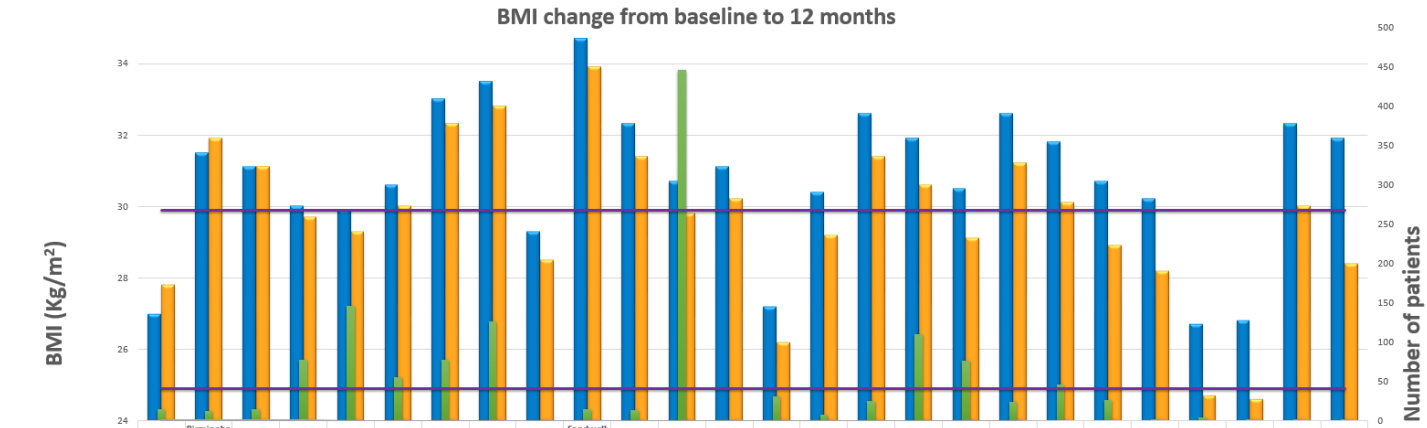
For the three organisations that delivered X-PERT Weight, the mean reduction in BMI was 1.8 kg/m² (95% CI: -2.0, -1.6). Betsi Cadwaladr University Health Board achieved the greatest reduction (-2.6 kg/m²; 95% CI: -3.3, -1.9) but only had 13 matched participant results whereas Helen Chauhan in Australia achieved a reduction of 2.2 (95% CI: -2.6, -1.8) for 63 participants.



	Isle of Wight	Birmingham - Heart of England	Essex	Trafford	Sandwell & West Birmingham	SMUK - Isle of Wight	Wiltshire	Bexley	Hounslow & Richmond	Shropshire	Solihull	All centre means	Barts - London	Stockport	SMUK - NW Surrey	SMUK - Thanet	Medway	Argyll & Bute	Berkshire	E&N Hertfordshire	Durham & Darlington
Baseline BMI	26.5	30.6	36.8	33	31.5	30.5	29.3	31.4	30.2	30.5	29.7	31	29	34.8	29.2	31.1	33.6	32.2	31.8	32.5	35.5
BMI at 6 months	26.7	30.6	36.6	32.8	31.2	29.7	28.5	30.5	29.3	29.6	28.7	29.9	27.8	33.5	27.9	29.7	32.1	30.6	30	30.7	33.1
Number of patients	24	30	3	4	21	22	59	138	342	85	54		1	2	119	4	126	10	168	39	56
Target BMI < 25	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9
Target < 30	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9
BMI change at 6 months	0.2	0	-0.2	-0.2	-0.3	-0.8	-0.8	-0.9	-0.9	-0.9	-1	-1.1	-1.2	-1.3	-1.3	-1.4	-1.5	-1.6	-1.8	-1.8	-2.4

At six months the mean *all centre* reduction in BMI for X-PERT participants was 1.1 kg/m² (95% CI: -1.2, -1.0), from 31.0 kg/m² to 29.9 kg/m² i.e. a shift from the obese category to the overweight category. The target lines of BMI <30 kg/m² and BMI <25 kg/m² have been inserted into the graph above for reference. Twenty organisations entered BMI data at six months. At baseline fifteen organisations had a mean BMI in the obese range. Eighteen organisations (90%)

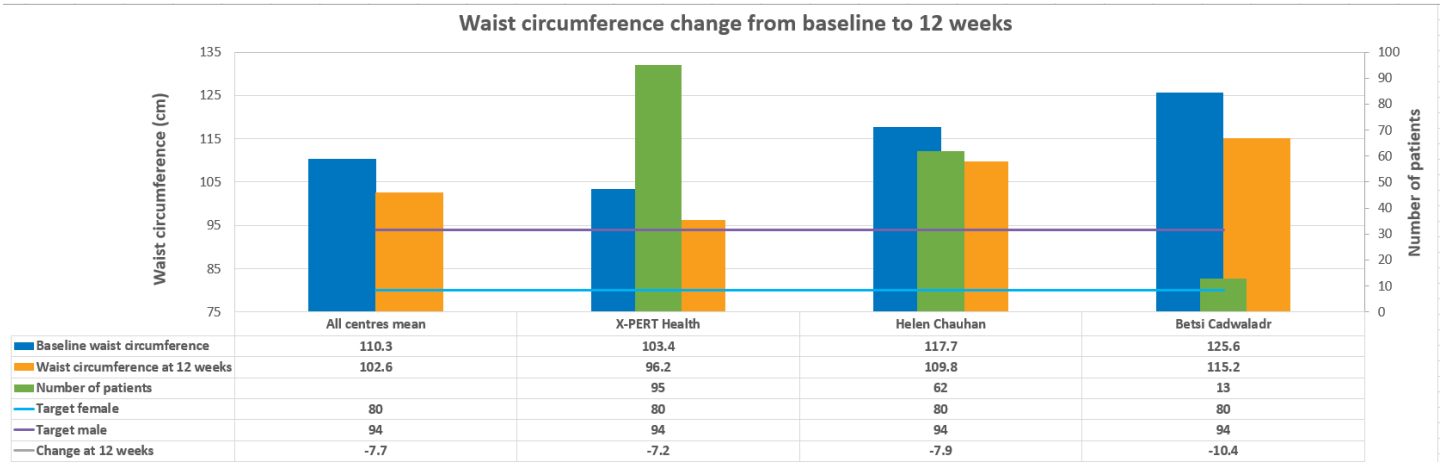
demonstrated a mean reduction in BMI and ten (67%) moved from the obese range to the overweight range. Durham & Darlington NHS Foundation Trust achieved the greatest mean reduction, of 2.4 kg/m² (95% CI: -2.9, -1.9), for 56 participant matched data sets.



	Isle of Wight	Birmingham - Heart of England	Birmingham - E&N	Betsi Cadwaladr	Barts - London	Essex	Argyll & Bute	Swansea	Heart of Birmingham	Sandwell & West Birmingham	Cwm Taf Morgannwg	Hounslow & Richmond	All centre means	SMUK - NW Surrey	Solihull	Homerton	Stockport	Berkshire	Bexley Health	Medway	E&N Hertfordshire	Gloria Simon	SMUK - Isle of Wight	SMUK - Thanet	Trafford	NE London
Baseline BMI	27	31.5	31.1	30	29.9	30.6	33	33.5	29.3	34.7	32.3	30.7	31.1	27.2	30.4	32.6	31.9	30.5	32.6	31.8	30.7	30.2	26.7	26.8	32.3	31.9
BMI at 12 months	27.8	31.9	31.1	29.7	29.3	30	32.3	32.8	28.5	33.9	31.4	29.8	30.2	26.2	29.2	31.4	30.6	29.1	31.2	30.1	28.9	28.2	24.7	24.6	30	28.4
Number of patients	15	13	15	78	146	55	78	127	1	15	14	447		31	8	25	110	77	24	46	26	2	4	2	2	2
Target BMI < 25	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9
Target < 30	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9
BMI change at 12 months	0.8	0.4	0	-0.3	-0.6	-0.6	-0.7	-0.7	-0.8	-0.8	-0.9	-0.9	-0.9	-1	-1.2	-1.2	-1.3	-1.4	-1.4	-1.7	-1.8	-2	-2	-2.2	-2.3	-3.5

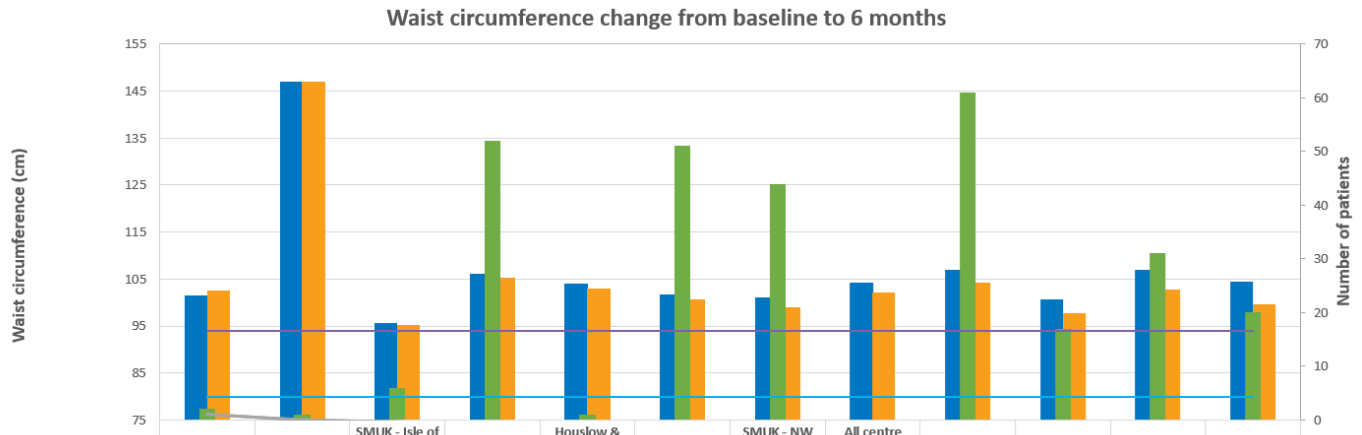
At 12 months the mean *all centre* reduction in BMI for X-PERT participants was 0.9 kg/m² (95% CI: -1.0, -0.8), from 31.1 kg/m² to 30.2 kg/m². Twenty-five organisations entered BMI data at 12 months. Of these, 19 (76%) had baseline mean BMI values in the obese range (≥30 kg/m²). Twenty-two organisations (88%) demonstrated a mean reduction in BMI and six organisations (32%) shifted from the obese category to the overweight category. Although North East London Foundation Trust demonstrated the greatest reduction (-3.5 kg/m², 95% CI: -6.8, -0.2) there were only two matched participant data sets. Medway Community Healthcare demonstrated a more robust dataset for 46 participants of -1.7 kg/m² (95% CI: -2.2, -1.2) whereas Berkshire demonstrated -1.4 kg/m² for 77 participants and Stockport, -1.3 kg/m² for 110 participants.

Waist circumference



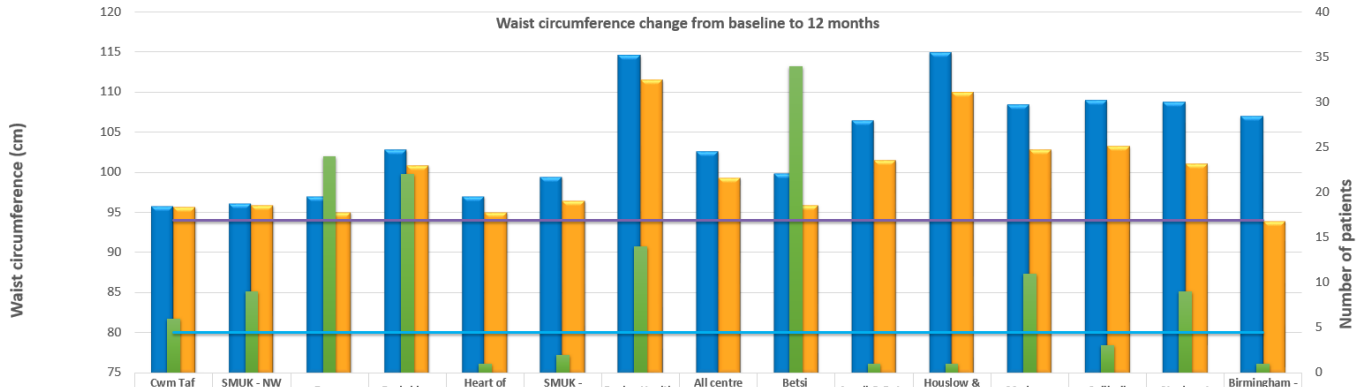
	All centres mean	X-PERT Health	Helen Chauhan	Betsi Cadwaladr
Baseline waist circumference	110.3	103.4	117.7	125.6
Waist circumference at 12 weeks	102.6	96.2	109.8	115.2
Number of patients		95	62	13
Target female	80	80	80	80
Target male	94	94	94	94
Change at 12 weeks	-7.7	-7.2	-7.9	-10.4

For the organisations delivering X-PERT Weight, at 12 weeks the mean reduction in waist circumference was 7.7cm (95% CI: -8.0, -7.4). Betsi Cadwaladr University Health Board achieved a mean reduction of 10.4cm (95% CI: -11.6, -9.2) for 13 matched participant data sets whereas Helen Chauhan in Australia achieved a mean reduction of 7.9cm (95% CI: -8.4, -7.4) for 62 participants and X-PERT Health, -7.2cm (95% CI: -7.6, -6.8) for 95 participants.



	SMUK - Thanet	Trafford	SMUK - Isle of Wight	Berkshire	Houslow & Richmond	Wiltshire	SMUK - NW Surrey	All centre means	Bexley Health	Solihull	Medway	Shropshire
Baseline waist circumference	101.5	147	95.7	106.1	104	101.7	101	104.3	106.9	100.6	106.9	104.5
Waist circumference at 6 months	102.5	147	95.3	105.2	103	100.7	98.9	102.1	104.2	97.8	102.8	99.7
Number of patients	2	1	6	52	1	51	44		61	17	31	20
Target female	80	80	80	80	80	80	80	80	80	80	80	80
Target male	94	94	94	94	94	94	94	94	94	94	94	94
Change at 6 months	1	0	-0.4	-0.9	-1	-1	-2.1	-2.2	-2.7	-2.8	-4.1	-4.8

At six months the mean *all centre* reduction in waist circumference for X-PERT participants was 2.2cm (95% CI: -2.4, -2.0), from 102.6cm to 99.4cm. The recommended waist circumference for a female is ≤80cm (blue line on the graph above) and for males is ≤94cm (purple line on the graph above). Only 11 organisations entered waist circumference data at six months. The graph above demonstrates that the mean waist circumference in every organisation was above the ideal range. At six months, nine organisations (82%) demonstrated a mean reduction in waist circumference. Shropshire Community Health NHS Trust achieved the best results at six months, with a mean reduction of 4.8cm (95% CI: -5.5, -4.1) with 20 participants matched data sets.



	Cwm Taf Morgannwg	SMUK - NW Surrey	Essex	Berkshire	Heart of Birmingham	SMUK - Thanet	Bexley Health	All centre means	Betsi Cadwaladr	Argyll & Bute	Houslow & Richmond	Medway	Solihull	Stockport	Birmingham - E&N
Baseline waist circumference	95.8	96.1	97	102.9	97	99.5	114.7	102.6	99.9	106.5	115	108.5	109	108.8	107
Waist circumference at 12 months	95.7	95.9	95.1	100.9	95	96.5	111.6	99.4	95.9	101.5	110	102.9	103.3	101.1	94
Number of patients	6	9	24	22	1	2	14		34	1	1	11	3	9	1
Target female	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Target male	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94
Change at 12 months	-0.1	-0.2	-1.9	-2	-2	-3	-3.1	-3.2	-4	-5	-5	-5.6	-5.7	-7.7	-13

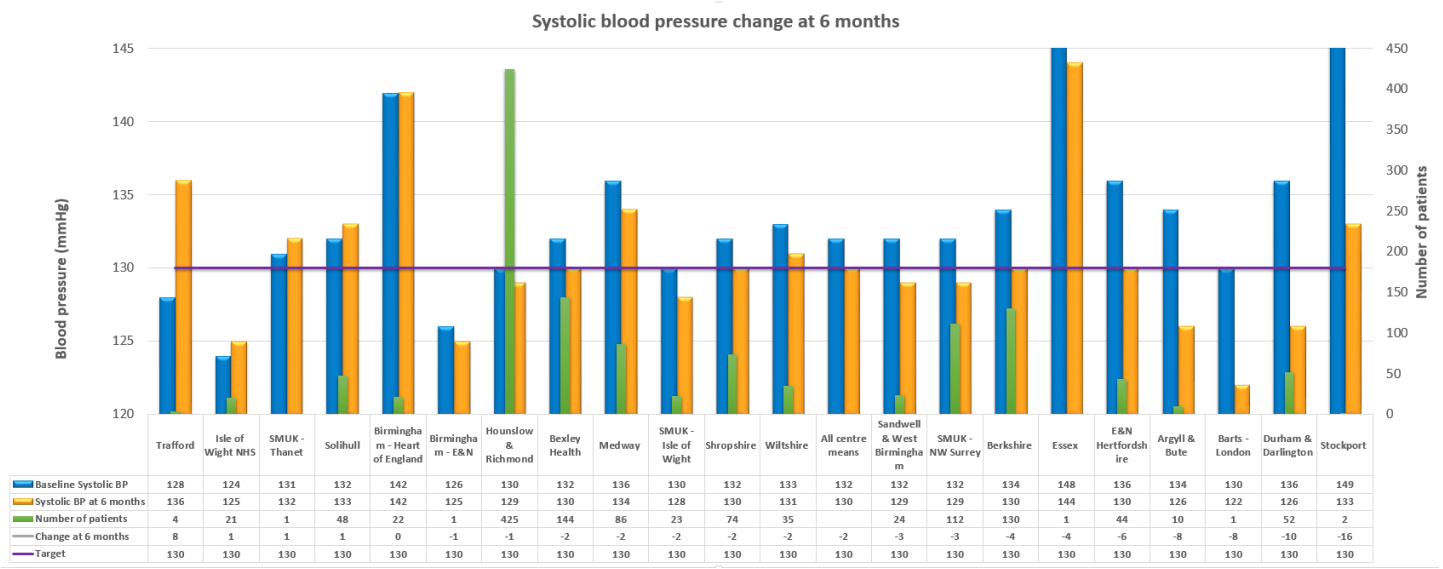
At 12 months the mean *all centre* reduction in waist circumference for X-PERT participants was 3.2cm (95% CI: -3.5, -2.9) from 104.3cm to 102.1cm. Fourteen organisations reported waist circumference at 12 months and all (100%) demonstrated a mean reduction. Although Birmingham Community Healthcare – East & North achieved the best results, this was only for one participant matched dataset. The greatest number of participant matched records was from Betsi Cadwaladr University Health Board who achieved -4.0cm (95% CI: -4.6, -3.4) for 34 participants.

Taking all these criteria into account, the largest impact on body weight and waist circumference award for X-PERT Weight goes to Helen Chauhan in Australia who had 62 to 64 matched data sets and achieved 6.0kg weight loss, 2.2kg/m^2 reduction in BMI and 7.7cm reduction in waist circumference. For X-PERT Diabetes, the award goes to Medway Community Healthcare with 4.4kg reduction in body weight at 6 months (128 matched data sets), 5.1kg reduction in body weight at 12 months (46 matched data sets), 4.1cm reduction in waist circumference at 6 months (31 matched data sets) and 5.6cm reduction at 12 months (11 matched data sets). Berkshire Healthcare NHS Foundation Trust have been awarded 2nd place, with 3rd place being awarded to Self-Management UK - North West Surrey CCG.

Cardiovascular disease (CVD) risk reduction

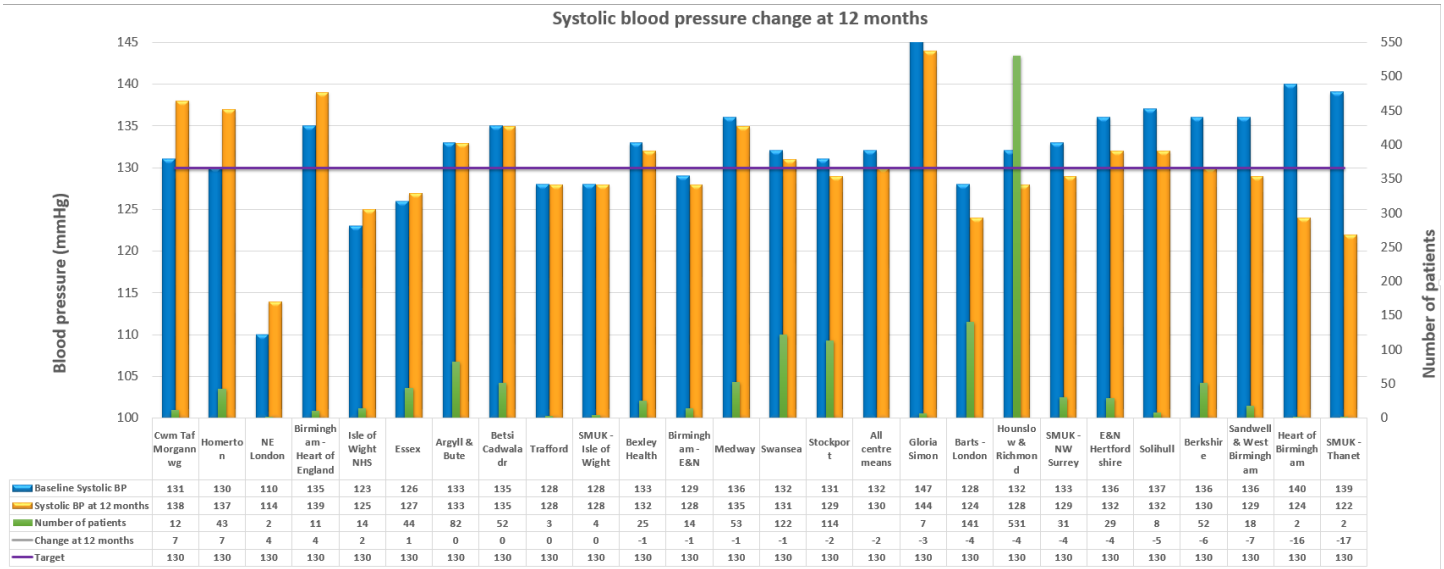
This award category considered the following criteria: reduction in systolic and diastolic blood pressure at six and 12 months; reduction in total cholesterol to HDL ratio; reduction in triglyceride to HDL ratio; number of participants for whom matched data was available; robust 95% confidence intervals.

Systolic blood pressure



	Trafford	Isle of Wight NHS	SMUK - Thanet	Solihull	Birmingham - Heart of England	Birmingham - E&N	Hounslow & Richmond	Bexley Health	Medway	SMUK - Isle of Wight	Shropshire	Wiltshire	All centre means	Sandwell & West Birmingham	SMUK - NW Surrey	Berkshire	Essex	E&N Hertfordshire	Argyll & Bute	Barts - London	Durham & Darlington	Stockport
Baseline Systolic BP	128	124	131	132	142	126	130	132	136	130	132	133	132	132	132	134	148	136	134	130	136	149
Systolic BP at 6 months	136	125	132	133	142	125	129	130	134	128	130	131	130	129	129	130	144	130	126	122	126	133
Number of patients	4	21	1	48	22	1	425	144	86	23	74	35		24	112	130	1	44	10	1	52	2
Change at 6 months	8	1	1	1	0	-1	-1	-2	-2	-2	-2	-2	-2	-3	-3	-4	-4	-6	-8	-8	-10	-16
Target	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130

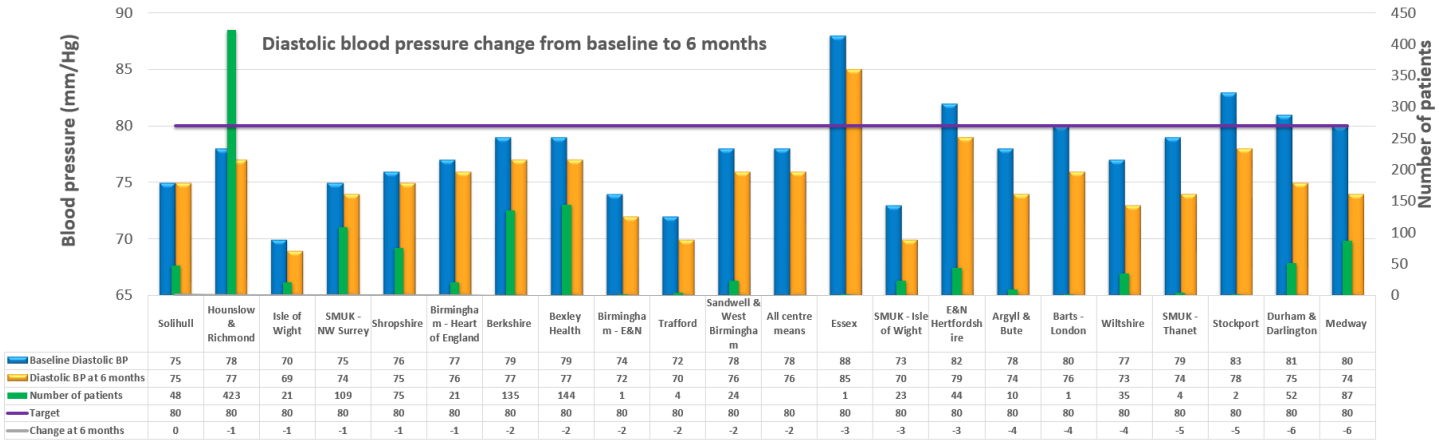
At six months the mean *all centre* reduction in systolic blood pressure for X-PERT participants was 2 mmHg (95% CI: -2, -2), from 132 to 130 mmHg. Target systolic blood pressure for an individual with Type 2 diabetes with no microvascular complications is ≤ 140 mmHg and the recommendation for Type 1 diabetes and for those with retinopathy or nephropathy is ≤ 130 mmHg. Twenty-one organisations provided systolic BP data at six months. Mean blood pressure was already equal to, or below, the 130 mmHg target at baseline for six organisations (29%). At six months, 16 organisations (76%) demonstrated a mean reduction in systolic blood pressure, moving them towards or below the 130 mmHg target. Thirteen organisations (62%) achieved a mean blood pressure ≤130 mmHg. Durham & Darlington NHS Foundation Trust achieved the greatest results at six months, with a mean reduction of 10 mmHg (95% CI: -10, -10) for 52 matched participant data sets.



	Cwm Taf Morgannwg	Homerton	NE London	Birmingham - Heart of England	Isle of Wight NHS	Essex	Argyll & Bute	Betsi Cadwaladr	Trafford	SMUK - Isle of Wight	Bexley Health	Birmingham - E&N	Medway	Swansea	Stockport	All centre means	Gloria Simon	Barts - London	Hounslow & Richmond	SMUK - NW Surrey	E&N Hertfordshire	Solihull	Berkshire	Sandwell & West Birmingham	Heart of Birmingham	SMUK - Thanet
Baseline Systolic BP	131	130	110	135	123	126	133	135	128	128	133	129	136	132	131	132	147	128	132	133	136	137	136	136	140	139
Systolic BP at 12 months	138	137	114	139	125	127	133	135	128	128	132	128	135	131	129	130	144	124	128	129	132	132	130	129	124	122
Number of patients	12	43	2	11	14	44	82	52	3	4	25	14	53	122	114		7	141	531	31	29	8	52	18	2	2
Change at 12 months	7	7	4	4	2	1	0	0	0	0	-1	-1	-1	-1	-2	-2	-3	-4	-4	-4	-4	-5	-6	-7	-16	-17
Target	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130

At 12 months the mean *all centre* reduction in systolic blood pressure for X-PERT participants was 2 mmHg (95% CI: -2, -2), from 132 to 130 mmHg**.** Twenty-five organisations reported systolic blood pressure at 12 months and eight of them (32%) already reported a mean systolic blood pressure ≤130 mmHg at baseline this increased to 14 organisations (56%) at 12 months. Sixteen organisations (64%) reported a reduction in systolic blood pressure. Birmingham Community Healthcare - Heart of Birmingham and Self-Management UK - Thanet CCG achieved the greatest reduction but only for two matched participant data sets. Sandwell & West Birmingham Hospital NHS Trust reported a 7 mmHg reduction (95% CI: -8, -6) for 18 matched participant data sets and Berkshire Healthcare NHS Foundation Trust reported a 6 mmHg reduction (95% CI: -6, -6) for 52 matched participant data sets.

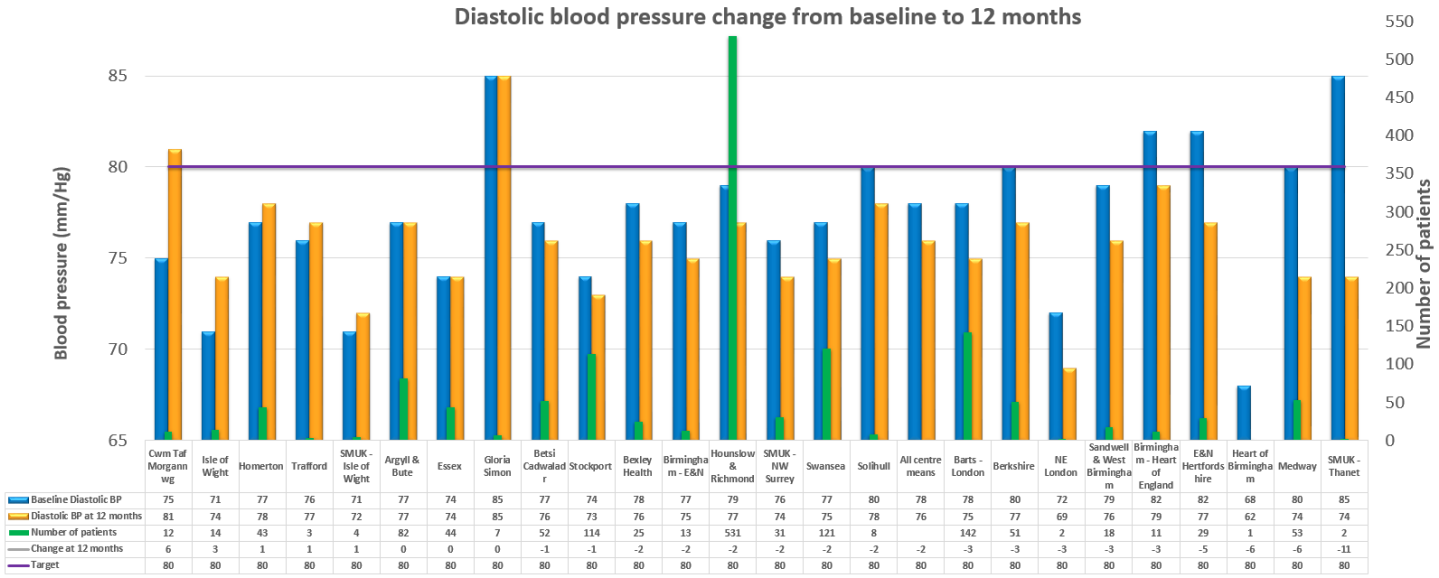
Diastolic blood pressure



	Solihull	Hounslow & Richmond	Isle of Wight	SMUK - NW Surrey	Shropshire	Birmingham - Heart of England	Berkshire	Bexley Health	Birmingham - E&N	Trafford	Sandwell & West Birmingham	All centre means	Essex	SMUK - Isle of Wight	E&N Hertfordshire	Argyll & Bute	Barts - London	Wiltshire	SMUK - Thanet	Stockport	Durham & Darlington	Medway
Baseline Diastolic BP	75	78	70	75	76	77	79	79	74	72	78	78	88	73	82	78	80	77	79	83	81	80
Diastolic BP at 6 months	75	77	69	74	75	76	77	77	72	70	76	76	85	70	79	74	76	73	74	78	75	74
Number of patients	48	423	21	109	75	21	135	144	1	4	24		1	23	44	10	1	35	4	2	52	87
Target	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Change at 6 months	0	-1	-1	-1	-1	-1	-2	-2	-2	-2	-2	-2	-3	-3	-3	-4	-4	-4	-5	-5	-6	-6

At six months the mean *all centre* reduction in diastolic blood pressure for X-PERT participants was 2 mmHg (95% CI: -2, -2), from 78 to 76 mmHg**.** The recommended diastolic blood pressure for people with diabetes is ≤80 mmHg. Twenty-one organisations entered data for diastolic blood pressure at six months. Seventeen organisations (81%) had mean

diastolic blood pressure readings ≤80 mmHg at baseline and this increased to 20 organisations (95%) at six months. Twenty organisations (95%) demonstrated a mean reduction in diastolic blood pressure, with the other two organisations reporting no change. Medway Community Healthcare and Durham & Darlington NHS Foundation Trust achieved the best results, both with a mean reduction of 6 mmHg (95% CI: -6, -6) and with 87 and 52 matched participant data sets respectively.

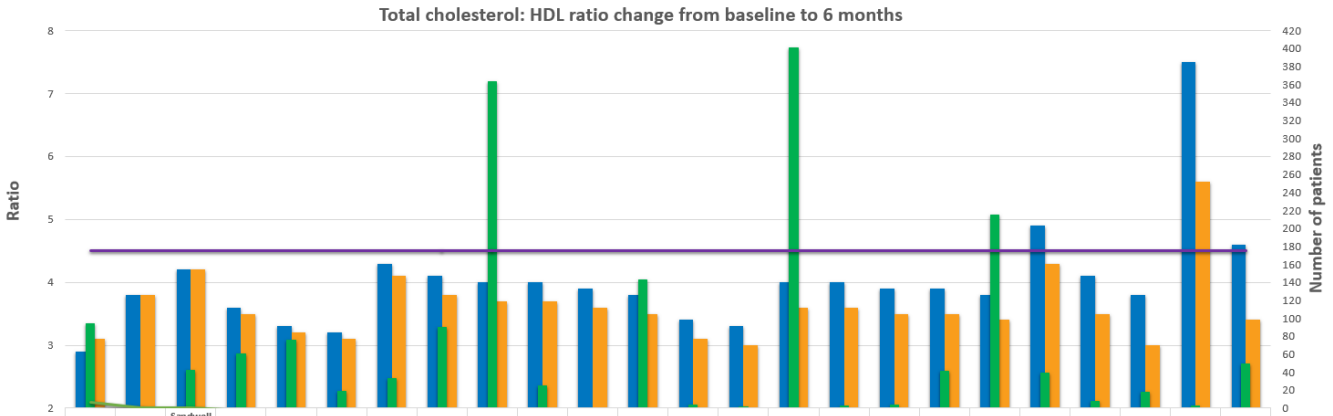


	Cwm Taf Morgannwg	Isle of Wight	Homerton	Trafford	SMUK - Isle of Wight	Argyll & Bute	Essex	Gloria Simon	Betsi Cadwaladr	Stockport	Bexley Health	Birmingham - E&N	Hounslow & Richmond	SMUK - NW Surrey	Swansea	Solihull	All centre means	Barts - London	Berkshire	NE London	Sandwell & West Birmingham	Birmingham - Heart of England	E&N Hertfordshire	Heart of Birmingham	Medway	SMUK - Thanet
Baseline Diastolic BP	75	71	77	76	71	77	74	85	77	74	78	77	79	76	77	80	78	78	80	72	79	82	82	68	80	85
Diastolic BP at 12 months	81	74	78	77	72	77	74	85	76	73	76	75	77	74	75	78	76	75	77	69	76	79	77	62	74	74
Number of patients	12	14	43	3	4	82	44	7	52	114	25	13	531	31	121	8		142	51	2	18	11	29	1	53	2
Change at 12 months	6	3	1	1	1	0	0	0	-1	-1	-2	-2	-2	-2	-2	-2	-2	-3	-3	-3	-3	-3	-5	-6	-6	-11
Target	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80

At 12 months the mean *all centre* reduction in diastolic blood pressure for X-PERT participant was 2 mmHg (95% CI: -2, -2), from 78 to 76 mmHg. Twenty-five organisations reported diastolic blood pressure at 12 months. Twenty-one organisations (84%) had mean diastolic blood pressure readings ≤80 mmHg at baseline and this increased to 23 organisations (92%) at six months. Seventeen organisations (68%) demonstrated a mean reduction of between 1 and 11 mmHg. Although Self-Management UK - Thanet CCG achieved the greatest reduction, it was only for one matched participant data set. Medway Community Healthcare achieved the most robust results with a mean reduction of 6 mmHg (95% CI: -6, -6) for 53 participants.

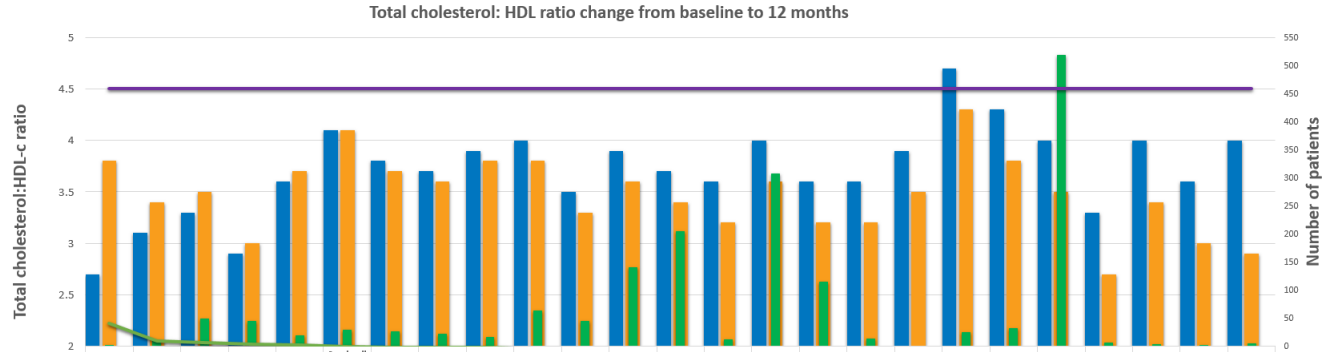
Total cholesterol to HDL cholesterol ratio

Total cholesterol to high-density lipoprotein (HDL) cholesterol ratio is as a good predictor of cardiovascular risk. This ratio is calculated by dividing total cholesterol level by HDL. Ideally it should be below 4.5, with a higher ratio indicating an increased risk of heart disease. A ratio above six is regarded as representing a high risk of heart disease. Where organisations enter total cholesterol and HDL cholesterol into the X-PERT audit database this ratio is automatically calculated.



	Berkshire	Birmingham - E&N	Sandwell & West Birmingham	Solihull	SMUK - NW Surrey	Isle of Wight	Birmingham - Heart of England	Virgin - Swale	Medway	E&N Hertfordshire	All centre means	Bexley Health	Stockport	Trafford	Hounslow & Richmond	SMUK - Thanet	Essex	Wiltshire	Shropshire	Cardiff & Vale	Barnsley	SMUK - Isle of Wight	Argyll & Bute	Durham & Darlington
Total:HDL ratio baseline	2.9	3.8	4.2	3.6	3.3	3.2	4.3	4.1	4	4	3.9	3.8	3.4	3.3	4	4	3.9	3.9	3.8	4.9	4.1	3.8	7.5	4.6
Total:HDL ratio 6 months	3.1	3.8	4.2	3.5	3.2	3.1	4.1	3.8	3.7	3.7	3.6	3.5	3.1	3	3.6	3.6	3.5	3.5	3.4	4.3	3.5	3	5.6	3.4
Number of patients	94	1	42	60	76	19	33	90	363	25		143	3	1	401	2	3	41	215	39	8	18	2	49
Total:HDL Change at 6 months	0.2	0	0	-0.1	-0.1	-0.1	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.4	-0.4	-0.4	-0.4	-0.4	-0.6	-0.6	-0.8	-1.9	-1.2
Target	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Change (%)	7	0	0	-3	-3	-3	-5	-7	-8	-8	-8	-8	-9	-9	-10	-10	-10	-10	-11	-12	-15	-21	-25	-26

At six months the mean *all centre* reduction in total cholesterol to HDL cholesterol ratio was 0.3 (95% CI: -0.3, -0.3), from 3.9 to 3.6. Total cholesterol to HDL cholesterol ratio was calculated for 23 organisations. Twenty organisations (87%) demonstrated a reduction between 0.3 (3%) and 1.2 (26%). Durham & Darlington NHS Foundation Trust achieved the greatest results with a 26% mean reduction of 1.2 (95% CI: -1.4, -1.0) with 49 matched participant data sets.

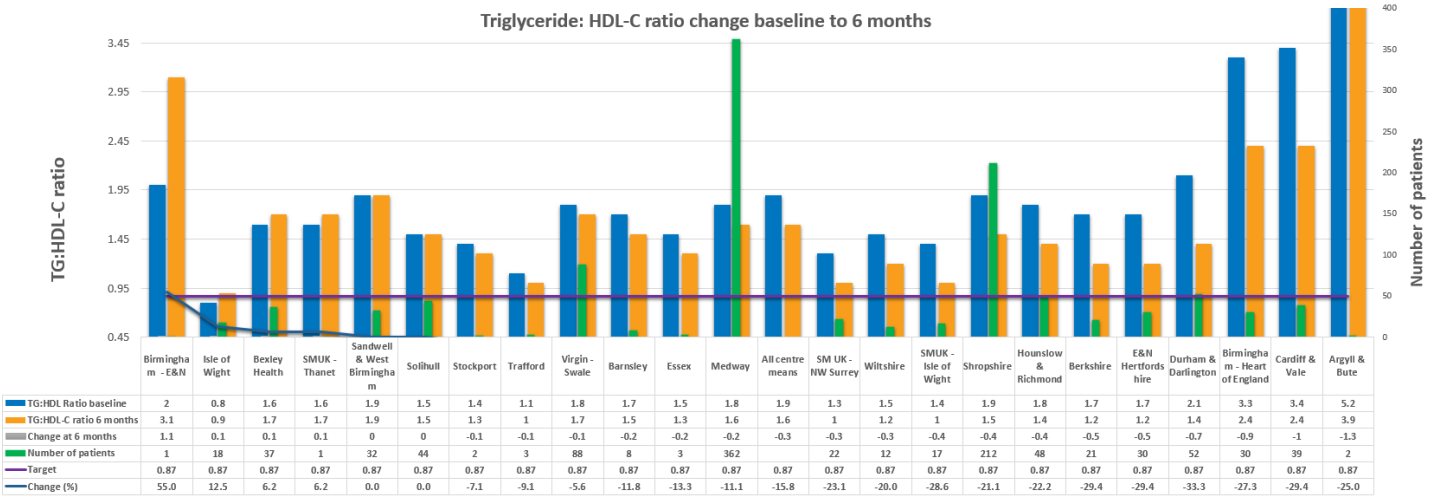


	Argyll & Bute	Isle of Wight	Berkshire	Betsi Cadwaladr	Cwm Taf Morgannwg	Sandwell & West Birmingham	Bexley Health	SMUK - NW Surrey	Birmingham - Heart of England	Barts - London	Essex	Homerton	Stockport	Birmingham - E&N	Medway	Swansea	E&N Hertfordshire	All centre means	Cardiff & Vale	Barnsley	Hounslow & Richmond	Solihull	Heart of Birmingham	SMUK - Thanet	SMUK - Isle of Wight
Total:HDL ratio	2.7	3.1	3.3	2.9	3.6	4.1	3.8	3.7	3.9	4	3.5	3.9	3.7	3.6	4	3.6	3.6	3.9	4.7	4.3	4	3.3	4	3.6	4
Total:HDL ratio 12 months	3.8	3.4	3.5	3	3.7	4.1	3.7	3.6	3.8	3.8	3.3	3.6	3.4	3.2	3.6	3.2	3.2	3.5	4.3	3.8	3.5	2.7	3.4	3	2.9
Total:HDL ratio Change at 12 months	1.1	0.3	0.2	0.1	0.1	0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.5	-0.5	-0.6	-0.6	-0.6	-1.1
Number of patients	1	10	49	45	19	29	26	22	16	63	44	140	204	12	307	114	13		25	32	518	6	3	1	4
Target	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Change (%)	41	10	6	3	3	0	-3	-3	-3	-5	-6	-8	-8	-11	-10	-11	-11	-10	-9	-12	-13	-18	-15	-17	-28

At 12 months the mean *all centre* reduction in total cholesterol to HDL cholesterol ratio for X-PERT participants was 0.4 (95% CI: -0.4, -0.4), from 3.9 to 3.5. Twenty-four organisations entered data for total cholesterol and HDL cholesterol at baseline and 12 months to enable the ratio to be calculated. Eighteen organisations (75%) demonstrated a mean ratio reduction of between 0.1 (3%) and 1.1 (28%). Self-Management UK - Isle of Wight CCG achieved the best results with a 28% mean reduction of 1.1 (95% CI: -1.9, -0.3), from 4.0 to 2.9, however there was only matched data for four participants. Hounslow and Richmond Community Healthcare NHS Trust demonstrated a 13% mean reduction of 0.5 (95% CI: -0.6, -0.4) with 518 matched participant data sets.

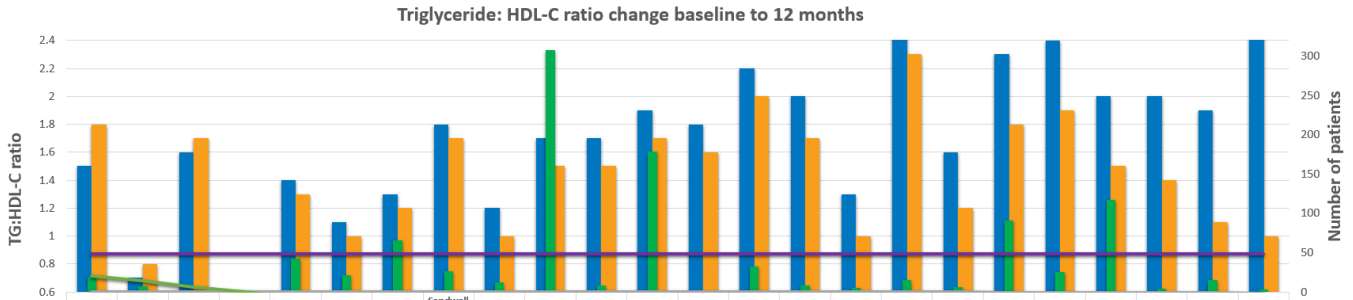
Triglyceride to HDL cholesterol ratio

The triglyceride to HDL cholesterol ratio (TG:HDL-C ratio) correlates CVD risk in both men and women. The ideal ratio is <0.87, with higher levels indicating increased risk. Where organisations enter triglyceride and HDL cholesterol into the X-PERT audit database this ratio is automatically calculated.



	Birmingham - E&N	Isle of Wight	Bexley Health	SMUK - Thanet	Sandwell & West Birmingham	Solihull	Stockport	Trafford	Virgin - Swale	Barnsley	Essex	Medway	All centre means	SM UK - NW Surrey	Wiltshire	SMUK - Isle of Wight	Shropshire	Hounslow & Richmond	Berkshire	E&N Hertfordshire	Durham & Darlington	Birmingham - Heart of England	Cardiff & Vale	Argyll & Bute
TG:HDL Ratio baseline	2	0.8	1.6	1.6	1.9	1.5	1.4	1.1	1.8	1.7	1.5	1.8	1.9	1.3	1.5	1.4	1.9	1.8	1.7	1.7	2.1	3.3	3.4	5.2
TG:HDL-C ratio 6 months	3.1	0.9	1.7	1.7	1.9	1.5	1.3	1	1.7	1.5	1.3	1.6	1.6	1	1.2	1	1.5	1.4	1.2	1.2	1.4	2.4	2.4	3.9
Change at 6 months	1.1	0.1	0.1	0.1	0	0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.4	-0.4	-0.4	-0.5	-0.5	-0.7	-0.9	-1	-1.3
Number of patients	1	18	37	1	32	44	2	3	88	8	3	362		22	12	17	212	48	21	30	52	30	39	2
Target	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Change (%)	55.0	12.5	6.2	6.2	0.0	0.0	-7.1	-9.1	-5.6	-11.8	-13.3	-11.1	-15.8	-23.1	-20.0	-28.6	-21.1	-22.2	-29.4	-29.4	-33.3	-27.3	-29.4	-25.0

At six months the mean *all centre* reduction in TG:HDL-C ratio was 0.3 (CI 95%: -0.4, -0.2), from 1.9 to 1.6**.** Twenty-three organisations provided triglyceride and HDL-C results at baseline and six months to enable this ratio to be calculated. Seventeen organisations (74%) demonstrated a reduction in the TG:HDL-C ratio of between 0.1 (7%) and 1.3 (25%). However, all organisations remained above the stated target. Argyll & Bute Community Health Partnership achieved the best result with a mean reduction of 1.3. However the confidence intervals were very wide (-3.2, 0.6) as there were only two matched participant data sets. Cardiff & Vale University Health Board achieved a mean reduction of 1.0 for 39 matched participant data sets with more robust confidence intervals (-1.6, -0.4).



	Cwm Taf Morgannwg	Isle of Wight	Heart of Birmingham	SMUK - Thanet	Betsi Cadwaladr	Essex	Homerton	Sandwell & West Birmingham	Birmingham - E&N	Medway	SMUK - NW Surrey	Stockport	All centre means	Barnsley	Berkshire	Solihull	Birmingham - Heart of England	Bexley Health	Hounslow & Richmond	Cardiff & Vale	Swansea	SMUK - Isle of Wight	E&N Hertfordshire	Barts - London
TG:HDL-C ratio baseline	1.5	0.7	1.6	0.4	1.4	1.1	1.3	1.8	1.2	1.7	1.7	1.9	1.8	2.2	2	1.3	2.6	1.6	2.3	2.4	2	2	1.9	2.7
TG:HDL-C ratio 12 months	1.8	0.8	1.7	0.4	1.3	1	1.2	1.7	1	1.5	1.5	1.7	1.6	2	1.7	1	2.3	1.2	1.8	1.9	1.5	1.4	1.1	1
Number of patients	19	7	2	1	42	21	66	26	12	308	8	179		32	8	5	15	6	91	25	117	4	15	3
Target	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Change at 12 months	0.3	0.1	0.1	0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.4	-0.5	-0.5	-0.5	-0.6	-0.8	-1.7
Change (%)	20.0	14.3	6.2	0.0	-7.1	-9.1	-7.7	-5.6	-16.7	-11.8	-11.8	-10.5	-11.1	-9.1	-15.0	-23.1	-11.5	-25.0	-21.7	-20.8	-25.0	-30.0	-42.1	-63.0

At 12 months the mean *all centre* reduction in TG:HDL-C ratio was 0.2 (95% CI: -0.3, -0.1), from 1.8 to 1.6**.** Twenty-three organisations provided triglyceride and HDL-C results at baseline and 12 months to enable this ratio to be calculated. Nineteen organisations (83%) demonstrated a reduction in the TG:HDL-C ratio of between 0.1 (7%) and 1.7 (63%). However, all organisations remained above the 0.87 target. Barts Health NHS Trust achieved the best results with a mean reduction of 1.7 but the 95% confidence intervals were wide (-3.4, 0.0) as there were only three matched participant data sets. Swansea Bay University Health Board demonstrated more robust results of a mean reduction of 0.5 (95% CI -0.9, -0.1) for 117 matched participant data sets and Hounslow and Richmond Community Healthcare NHS Trust also achieved a mean reduction of 0.5 (95% CI: -1.0, 0.0) for 91 matched participant data sets.

Taking all these criteria into account, the organisation with the greatest improvement in cardiovascular disease risk factors is Hounslow and Richmond Community Healthcare NHS Trust. The organisation saw a 1 mmHg reduction in systolic blood pressure at six (425 matched data sets) and a 4 mmHg reduction at 12 months (531 matched data sets); 1 mmHg reduction in diastolic blood pressure at six (423 matched data sets) and a 2 mmHg reduction at 12 months (531 matched data sets); 0.4 reduction in total cholesterol to HDL ratio at 6 months (401 matched data), 0.5 reduction in total cholesterol to HDL ratio at 12 months (518 matched data sets); 0.4 reduction in TG:HDL ratio at 6 months (48 matched data sets) and 0.5 reduction in TG:HDL ratio at 12 months (91 matched data sets). Medway Community Healthcare have been awarded 2nd place, with 3rd place being awarded to Self-Management UK - North West Surrey CCG.

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. During these challenging times with the COVID-19 pandemic, it has become necessary to change the interface of group-based structured education to virtual means. Fortunately we now have a menu of options available to enable participants to access, and engage in, education in their own homes:

1. The X-PERT Diabetes Digital Programme. More information can be found at: https://www.xperthealth.org.uk/digital-programmes/
2. Delivery of the full X-PERT Diabetes, X-PERT Insulin and X-PERT Weight Programmes virtually utilising the digital 'drag and drop' resources and delivering to groups of participants using virtual platforms such as Microsoft Teams and Zoom
3. Providing participants with links to the relevant summary key learning points (KLPs) videos and then arranging weekly group sessions via a virtual platform to discuss session content, answer queries and facilitate goal setting.

N.B. All the above options require an X-PERT Diabetes, X-PERT Insulin or X-PERT Weight Handbook/Resource Folder to be mailed to each participant.

Limitations

On-going audit does not have the same meticulous regulation as collecting data as part of a controlled trial, and as such there are a number of limitations. Principle amongst these is the lack of time available for healthcare professionals to follow up with participants and/or to enter data. Audit is essential however to assess whether programme implementation is effective, and so it is important that efforts are made to maximise the collection and entry of relevant data.

To maximise the validity of the presented data X-PERT only uses matched data as part of its audit process, in contrast to many other organisations who compare baseline and post-programme averages despite these averages being based on different sets of participants. This method does however also reduce the amount of data that is available. For example, some organisations have only entered baseline results and therefore no matched data is available. Other organisations have not entered sufficient six 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.

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. 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 five categories, where awards are presented to the organisations who have obtained the best audit results. These categories are:

- The best participant experience
- The greatest improvement in glycated haemoglobin
- The largest impact on body weight and waist circumference (separately for the diabetes and weight programmes)
- The greatest improvement in cardiovascular disease risk factors (lipids and BP)
- X-PERT Best Educator 2020

The winners were announced via our website and social media on Wednesday 11th November.

Winners for each category

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: Derbyshire Community Health Services - South Derbyshire CCG
- 2nd place: Self-Management UK - North West Surrey CCG
- 3rd place: Betsi Cadwaladr University Health Board
- Highly commended: Wiltshire Health and Care, and Barts Health NHS Trust

The greatest improvement in glycated haemoglobin

The following criteria were taken into consideration: HbA1c reduction at six months and 12 months; number of participants for whom matched data was available; robustness of 95% confidence intervals.

- Winner: Medway Community Healthcare
- 2nd place: Berkshire Healthcare NHS Foundation Trust

- 3rd place: Cardiff & Vale University Health Board
- Highly commended: Durham & Darlington NHS Foundation Trust, Virgin Care - Swale CCG, Hounslow & Richmond Community Healthcare NHS Trust, and X-PERT Health Managed Service in East & North Hertfordshire CCG for six month data

The largest impact on body weight and waist circumference

The following criteria were considered: body weight and waist circumference reduction at six months and 12 months; number of participants for whom matched data was available; average number of attendees per programme; robustness of 95% confidence intervals.

- Winner: Medway Community Healthcare
- 2nd place: Berkshire Healthcare NHS Foundation Trust
- 3rd place: Self-Management UK - North West Surrey CCG
- Highly commended: Durham & Darlington NHS Foundation Trust for six month data
- Winner for the X-PERT Weight Programme: Helen Chauhan, Australia

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, triglyceride to HDL ratio and blood pressure (systolic and diastolic) at six and 12 months; number of participants for whom matched data was available; robustness of 95% confidence intervals.

- Winner: Hounslow and Richmond Community Healthcare NHS Trust
- 2nd place: Medway Community Healthcare
- 3rd place: Self-Management UK - North West Surrey CCG
- Highly commended: Durham & Darlington NHS Foundation Trust, Wiltshire Health and Care and Shropshire Community Health NHS Trust for six month data and Swansea Bay University Health Board for 12 month data

The X-PERT Best Educator award 2020

Nominations were requested from healthcare professionals, participants and organisations. Nominees were scored based on educator impact and the following criteria from the audit database: participant satisfaction; change in empowerment; reductions in weight and HbA1c (based on matched data, with the robustness of 95% confidence intervals considered). A total of nine nominations were received.

- **Winner: Fiona Rowlandson – Berkshire Healthcare NHS Foundation Trust**

  Over the previous five years, Fiona delivered the X-PERT Programme to 297 participants. She achieved a 96.8% completion rate (participants attended 4 or more sessions) during this period. Participants reported a 96.8% mean satisfaction score and an 18.4% increase in empowerment after attending her courses. Clinical improvements: weight at 6 months (reduction of 3.4kg, 95% CI: -4.0, -2.8 [100 matched participant data sets]) and 12 months (reduction 2.6kg, 95% CI: -3.3, -1.9 [80 matched participant data sets]); waist circumference (reduction of 0.6cm, 95% CI: -1.2, 0.0 [45 matched participant data sets]) and 12 months (reduction 1.8cm, 95% CI: -2.4, -1.2 [43 matched participant data sets]); HbA1c at 6 months (reduction of 14.9mmol/mol, 95% CI: -15.6, -14.2 [83 matched participant data sets] and 12 months (reduction of 9.3mmol/mol, 95% CI: -10.0, -8.6 [74 matched participant data sets]) were seen as well as reductions in cardiovascular risk factors at both six months and one year post course.

- **2nd place: Trisna Patel & Ruth Cook – University Hospitals Birmingham NHS - Solihull**
- **3rd place: X-PERT Educators at Swansea Bay University Health Board**
- **Commended: Heidi Giaever** for the number of nominations and testimonials received along with her commitment to deliver X-PERT sessions via Zoom from March 2020 with the COVID pandemic.

Conclusion

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 for more information. Attending regular X-PERT Educator Update Training and the annual X-PERT Conference & Awards also helps with the sharing of good practice to further drive quality improvement.

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.

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.

The audit will continue to be repeated annually. However, as group sessions have now been curtailed due to COVID-19 and structured education is being delivered remotely, there may be new challenges in keeping participants engaged and we strongly encourage educators to continue auditing implementation so that we can determine the impact of remote delivery and benchmark outcomes against audit standards.

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