

Cost-effective health

Estimated cost effectiveness of the BTCV Green Gym between 2005 – 2009



Foreword

There is recognition amongst environmental and health professionals that green space benefits peoples' health. In particular, green space offers an alternative and motivating environment that supports people's mental and physical health. BTCV's Green Gym was one of the first programmes in the world to capitalise on this synergy, helping people to become more active in the outdoors through conservation work. Earlier research showed the direct physical health benefits to Green Gym participants, but like many health interventions, there is always a question of cost and value for money.

This paper brings together real cost data with some of the projected health benefits of the Green Gym and shows that this type of green exercise can be very cost effective. This paper makes a welcome and important contribution to the development of the green exercise evidence base, and starts to demonstrate the potential of green space as part of an upstream approach to delivering public health, while also delivering a sustainable natural environment.

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Summary

Drawing on previous costing approaches by the National Institute for Health and Clinical Excellence (NICE) and others, this paper presents estimates of:

- The value of BTCV's Green Gym programme in England between 1 April 2005 and 31 March 2009.
- The health value of provision of greenspace access.

It is important to note that the values presented in the paper are based on assumptive models. Available data is limited and this prevents all costs and benefits from being included in the calculations.

The models gave the following estimates of the value of the Green Gym programme over a 4 year period:

- 132 Quality Adjusted Life Years (QALY) delivered at a cost of £4031 per QALY, which is substantially less than the £30,000 ceiling normally applied by NICE when determining if an intervention is cost effective.

- Savings to the health service of £1,359,453 (based on life cost averted savings).
- A cost-benefit ratio of 1 to 2.55, so that, for every £1 invested in Green Gym infrastructure, £2.55 has been saved in the treatment of inactivity related illness (based on life cost averted savings).

Recent work has shown that where people have good perceived and/or actual access to green space they are 24% more likely to be physically active. If this effect was universal and the population of England was afforded equitable good access to green space, it is estimated that life-cost averted saving to the health service could be in order of £2.1 billion per annum.

Introduction

BTCV's Green Gym aims to improve physical and mental health through environmental volunteering. First created in 1998, BTCV has established over 100 Green Gyms in communities and schools across the UK. Green Gym groups take part in activities such as maintaining footpaths, managing woodlands and food growing.

Independent evaluation by Oxford Brookes University has proven the mental and physical health benefits of Green Gym. BTCV wanted to build upon this by demonstrating how investment in the Green Gym can save money on the treatment of inactivity related illness. BTCV's Strategic Plan 2009-2013 *Investing in Sustainable Futures* commits the organisation to: "demonstrating the case for investment, value for money and social return that our funders can achieve by supporting us". In this paper, we have taken the period April 2005 – March 2009 because, throughout this time, BTCV Green Gym has been supported by a Strategic Grant from Communities and Local Government (CLG). Therefore, this paper aims to show the return on the investment made by CLG.

The calculations in this paper are based on:

- The number of Green Gym participants between April 2005 and March 2009, as recorded on BTCV's online Management Information System and as reported by independent Green Gym community groups.
- BTCV's actual expenditure on Green Gym infrastructure in England, which includes training, evaluation and support provision to local Green Gym projects. Local expenditure on Green Gyms has not been included.

Table 1: QALY gains and cost from participation in 1 Green Gym session per week

Years of Activity	2005-06 cohort	2006-07 cohort	2007-08 cohort	2008-09 cohort
1				1,093
2			1,054	
3		1,008		
4	1,543			
QALY gained	0.0427072	0.0320304	0.0213536	0.0106768
Total QALY from Green Gym participation	65.8972096	32.2866432	22.5066944	11.6697424
Total Additional QALY delivered by Green Gym	132.3602896			
Green Gym cost	£533,510			
Cost per QALY	£4,031			

Estimate of 'Quality Adjusted Life Years' delivered by Green Gym

A Quality Adjusted Life Year (QALY) is a standardised unit of health outcome. It is used extensively in the UK as a means of expressing the health benefit from an intervention and to enable different interventions to be compared.

NICE normally apply a £30,000 threshold per QALY when determining if an intervention is cost-effective.

It has been assumed that participants attend weekly Green Gym sessions and that this is an additional physical activity, not a substitute. The QALY gained from the physical activity is calculated using figures from NICE (2007). These are shown in Appendix A on page 4.

Table 1 above shows the QALY gains and costs from participation in Green Gym

This assumes that all participants do one additional physical activity event per week and adhere to the programme for the duration.

Over the 4 year period, an estimated 132 QALYs were delivered at a cost of £4031 per QALY. This is significantly less than the £30,000 ceiling normally applied by NICE.

Estimate of life-costs averted savings by Green Gym

Life-cost averted is effectively what the National Health Service saves by not having to treat illness.

For this paper the life-cost averted model is based on three health conditions for which the prevalence in the general population and the annual cost per person of treatment are known (NICE, 2006). These are:

- Cardio-vascular heart disease (CHD)
- Stroke
- Type 2 diabetes

The model assumes that Green Gym participants are representative of the general population, and that they adhere to the programme of physical activity.

The model estimates that the cumulative life-cost averted saving to the health service has been £1,359,453 over the 4 year period.

This level of life-cost averted saving gives a cost-benefit ratio of 1 to 2.55. In other words, for every £1 invested in Green Gym training, evaluation and support, £2.55 worth of health benefit is delivered. See Table 2 on page 3.

Estimate of the life-costs averted by improving and increasing access to green spaces

Recent work has shown that where people have good perceived and/or actual access to green space they are 27% more like to be physically active (Hillsdon and others, in press; Jones and others, 2009). Tsuji (2003) showed the medical cost saving per capita of people walking an hour a day, for example, as part of their journey to work.

Taking these pieces of information, a life-cost averted saving to the health service arising from universal and equitable access to green space has been calculated assuming that:

- Everyone behaves in a similar manner.
- Everyone's health outcome benefits equally.
- All things being equal 24% of the population would increase their level of physical activity to recommended levels through access to green space (based on Coombs and others, in press).

Table 3 shows the simple model of life-cost averted saving under this greenspace scenario. The model shows a potential life-cost averted saving of £2.119 billion per annum. The figure for the total population cost saving (£8.8 billion) is consistent with estimates of the cost of physical inactivity (DH, 2004).

Table 2: Annualised life-cost averted savings for 4 years of Green Gym

2005-06	Percentage prevalence	GG Registered Participants	GG Cohort Prevalence	Cost/person/year	Total per annum saving
CHD	4.30	1,543	66.35	£2,205	£146,299.55
Stroke	2.51		38.73	£3,010	£116,575.19
Type 2 diabetes	3.69		56.94	£3,225	£183,620.86
					£446,495.60

2006-07	Percentage prevalence	GG Registered Participants	GG Cohort Prevalence	Cost/person/year	Total per annum saving
CHD	4.30	1,008	43.34	£2,205	£95,573.52
Stroke	2.51		25.30	£3,010	£76,155.41
Type 2 diabetes	3.69		37.20	£3,225	£119,954.52
					£291,683.45

2007-08	Percentage prevalence	GG Registered Participants	GG Cohort Prevalence	Cost/person/year	Total per annum saving
CHD	4.30	1,054	45.32	£2,205	£99,935.01
Stroke	2.51		26.46	£3,010	£79,630.75
Type 2 diabetes	3.69		38.89	£3,225	£125,428.64
					£304,994.40

2008-09	Percentage prevalence	GG Registered Participants	GG Cohort Prevalence	Cost/person/year	Total per annum saving
CHD	4.30	1,093	47.00	£2,205	£103,632.80
Stroke	2.51		27.43	£3,010	£82,577.24
Type 2 diabetes	3.69		40.33	£3,225	£130,069.73
					£316,279.77
Total saving over 4 years					£1,359,453.21

Table 3: Life-cost averted saving through increasing physical activity across the population through access to greenspace

Estimated population of England 2009	50,762,000
Tsuji – monthly cost saving	£14.50
Tsuji annualised	£174.00
Total population cost saving	£8,832,588,000.00
Cost saving assuming 24% likelihood of Physical Activity with green space access	£2,119,821,120.00

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Natural England Technical Information Notes are available to download from the Natural England website: www.naturalengland.org.uk.



Appendix A

QALY gains from additional sessions of physical activity (NICE, 2007,p23)

Time (years)	Total QALYs (100% compliance)				
	1 session per week	2 sessions per week	3 sessions per week	4 sessions per week	5 sessions per week
1	0.0106768	0.021354	0.03203	0.042707	0.053384
2	0.0213536	0.042707	0.064061	0.085414	0.106768
3	0.0320304	0.064061	0.096091	0.128122	0.160152
4	0.0427072	0.085414	0.128122	0.170829	0.213536
5	0.053384	0.106768	0.160152	0.213536	0.26692
6	0.0640608	0.128122	0.192182	0.256243	0.320304
7	0.0747376	0.149475	0.224213	0.29895	0.373688
8	0.0854144	0.170829	0.256243	0.341658	0.427072
9	0.0960912	0.192182	0.288274	0.384365	0.480456
10	0.106768	0.213536	0.320304	0.427072	0.53384
11	0.1174448	0.23489	0.352334	0.469779	0.587224
12	0.1281216	0.256243	0.384365	0.512486	0.640608
13	0.1387984	0.277597	0.416395	0.555194	0.693992
14	0.1494752	0.29895	0.448426	0.597901	0.747376
15	0.160152	0.320304	0.480456	0.640608	0.80076
16	0.1708288	0.341658	0.512486	0.683315	0.854144
17	0.1815056	0.363011	0.544517	0.726022	0.907528
18	0.1921824	0.384365	0.576547	0.76873	0.960912
19	0.2028592	0.405718	0.608578	0.811437	1.014296
20	0.213536	0.427072	0.640608	0.854144	1.06768
21	0.2242128	0.448426	0.672638	0.896851	1.121064
22	0.2348896	0.469779	0.704669	0.939558	1.174448
23	0.2455664	0.491133	0.736699	0.982266	1.227832
24	0.2562432	0.512486	0.76873	1.024973	1.281216
25	0.26692	0.53384	0.80076	1.06768	1.3346
26	0.2775968	0.555194	0.83279	1.110387	1.387984
27	0.2882736	0.576547	0.864821	1.153094	1.441368
28	0.2989504	0.597901	0.896851	1.195802	1.494752
29	0.3096272	0.619254	0.928882	1.238509	1.548136
30	0.320304	0.640608	0.960912	1.281216	1.60152

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