



Keeping children active

Competition for development contracts

April 2009

NHS

East of England

SBRI Government challenges.
Ideas from business.
Innovative solutions.

SBRI is a programme that brings innovative solutions to specific public sector needs, by engaging a broad range of companies in competitions for ideas that result in short-term development contracts.

Joint funders:

Technology Strategy Board
Driving Innovation



Summary

An SBRI competition is being launched in the East of England to look for ways that technology could be used to improve how children stay fit and healthy. Children are taking less exercise than they used to and there are rising rates of obesity amongst young people – increasing by 45% over the last 10 years. We need ideas that can make a difference to encouraging these children to take more exercise.

Have you got a technology or product idea that could help? Your business may use technology that has previously had nothing to do with the healthcare sector, but could cross over into this area and demonstrate improvement.

The areas where we're looking for affordable technology to be applied are:

- Motivating children at risk of obesity to take more exercise
- Monitoring the amount of exercise that children are taking and encouraging them to be more active.

The new SBRI programme is led by the Technology Strategy Board and is a cross-government procurement programme for innovative solutions, which includes demonstrating and evaluating the new technologies that are developed. The NHS East of England and the East of England Development Agency, together with the European Regional Development Fund and the Technology Strategy Board, are jointly funding this regional pilot SBRI competition.

All applications need to demonstrate that they will be contributing to carbon reduction. This could be through reduction in energy, travel, waste, water or building design. Innovations which make systems more efficient are welcomed.

Developments will be 100% funded and suppliers for each project are selected in this open competition process. The competition is run in two phases. Several projects, of up to 6 months and £100k, will be funded in Phase 1, feasibility. Successful projects will then be funded for Phase 2, up to 2 years and £750k in prototype development. Businesses will retain the intellectual property generated from the project, with certain rights of use retained by the NHS.

Background and challenge

Children are taking less physical activity than they used to, and this is one of the contributory factors to the rise in obesity rates. Obesity leads to heart disease, type 2 diabetes and other diseases including some cancers. Increasing physical activity in children should help to combat this rise in obesity.

Obesity is considered a worldwide epidemic, but it wasn't until 1997 that the World Health Organisation accepted that this was a major public health problem and, even then, there was no accepted method for monitoring the problem in children¹. Obese children and young people have an increased risk of becoming overweight/obese adults and developing adult diseases such as cardiovascular disease, type 2 diabetes and some cancers. "Pre-school years may be a critical period for obesity prevention²."

The current cost of obesity to the UK economy is estimated to be £3.5 billion each year (healthcare/treatment costs and sickness days off work). The Government's recent Foresight modelling study forecast that overall costs to society would reach £50 billion per year by 2050 on current trends. The cost of obesity-related diseases is enormous (see table). The cost of heart disease to the UK economy was estimated at £29.1 billion in 2004, with coronary heart disease (CHD) and cerebrovascular disease accounting for 29% and 27% of the total. The major cost component of CHD was healthcare which accounted for 60%, followed by productivity losses due to mortality and morbidity accounting for 23%, and the remaining 17% due to informal care-related costs. The cost of diabetes to the NHS stands at approximately £1 million per hour – a tenth of the NHS budget – and is rapidly increasing. As many as 2.75 million people in the UK now have diabetes, with 2 million having type 2 diabetes.



Obesity-related illness

Disorder	Annual cost	Source
Diabetes	£9 billion	Diabetes UK
Coronary heart disease	£6.3 billion	Dept of Health Annual Report, 2007, (figures for 2005-2006)
Cancers and tumours	£4.4 billion	Department of Health Annual Report, 2007
Obesity	£1 billion	Minister of State (Public Health), Department of Health
Stroke	£2.8 billion	National Audit Office
Osteoporosis	£1.7 billion	National Osteoporosis Society

Across the UK, the incidence and prevalence of obesity continues to rise. In England alone, nearly a quarter of men and women are now obese. Almost a fifth of 2 to 5 year olds are obese, while a further 14% are overweight. By 2010, an estimated 12 million adults and one million children will be obese in England alone. The Foresight modelling study indicates that, on current trends, nearly 60% of the UK population will be obese by 2050 (i.e. almost two out of three in the population defined as severely overweight). Failure to reverse this will result in millions of adults and children facing deteriorating health, lower quality of life and increasing health and social care costs.

The proportion of girls aged 2 to 15 who were obese did decrease between 2005 and 2006, from 18% to 15%. But there was no significant decrease among boys aged 2 to 15 over that period. Boys were more likely than girls to be obese (17% compared to 15%). Of children aged 8 to 15 who were classed as obese, 66% of girls and 60% of boys thought that they were too heavy. In 2006, boys were more likely than girls to meet the recommended levels of physical activity, with 70% of boys and 59% of girls reporting taking part in 60 minutes or more of physical activity on all 7 days in the previous week. In 2006-07, 86% of pupils took part in at least two hours of high quality PE and sport a week, a gradual increase since 2003-04 when the figure was 62%.

Low income

Members of low-income households in the UK are more likely to have diets that are less inclined to lead to good health outcomes; short- and long-term. Health inequalities, including the likelihood of child and adulthood obesity, have long been documented in the UK³. Poor diet and physical inactivity (and obesity) disproportionately affect the poor,

so that if financial incentives for this group can be changed this may have a significant impact on the reduction of health inequalities. More specifically, there is some evidence to suggest that the availability of reasonably priced 'healthy' food, and of affordable opportunities for physical activity, may be particularly constrained for those who live in deprived neighbourhoods, and that this limitation may be associated with poor diet and obesity.

Sub-groups

It is also important to address the particular needs of sub-groups of children. For example, although immigrants new to developed countries may be more vulnerable to sub-optimal levels of exercise and food consumption, one review found that "no programmes were identified that specifically targeted their potentially specialised needs (e.g. different food supply in a new country)⁴".

Role of schools

Evidence shows that schools policy can be an important tool in tackling childhood obesity. "Schools were found to be a critical setting for programming where health status indicators, such as body composition, chronic disease risk factors and fitness, can all be positively impacted. Engagement in physical activity emerged as a critical intervention in obesity prevention and reduction programmes⁵."

For example, a traffic light nutrition tool has been shown to improve the knowledge, attitude and behaviour of 5 to 7 year-olds by encouraging children to freely eat green food, eat amber food in moderation and stop and think before eating red food⁶.

³Symposium on 'Intervention policies for deprived households' Policy initiatives to address low-income households' nutritional needs in the UK ⁴Reducing obesity and related chronic disease risk in children and youth: a synthesis of evidence ⁵Reducing obesity and related chronic disease risk in children and youth: a synthesis of evidence with 'best practice' recommendations.

⁶Impact of a traffic light nutrition tool in a primary school

National Institute for Clinical Excellence guidance

Public health guidance is available from the National Institute for Clinical Excellence (NICE), covering physical activity for children, adults, employers and in the environment. It recommends:

- Promoting the benefits of physical activity and encouraging participation
- Ensuring high-level strategic policy planning for children and young people supports the physical activity agenda
- Consultation with, and the active involvement of, children and young people
- The planning and provision of spaces, facilities and opportunities
- The need for a skilled workforce
- Promoting physically active and sustainable travel
- The development of a cadre of physical activity facilitators, attached to primary care delivery agents.

At a regional level, it recommends that incentives must be introduced for local authorities:

- To preserve playing fields and other open spaces
- To address quality and safety issues and concerns among users
- To introduce safe play environments within open spaces, including ranger and park keeping schemes and safe walking environments.

At local NHS level, it recommends brief interventions to promote physical activity as a routine part of primary care, using referral to properly trained and resourced physical activity and lifestyle coaches. Interventions that encourage walking and do not require attendance at a facility are the most likely to lead to sustainable increases in overall physical activity, and should be encouraged. There is strong evidence that individually adapted health behaviour change programmes are effective in increasing physical activity levels.

These should therefore be used in primary care. Social support interventions in community settings are effective in increasing physical activity and therefore should be encouraged.

Schools are advised to maintain and enhance physical education. With regard to the environment, a combination of physical changes to working practices, policies and the physical environment appear to encourage adults to maintain their vigorous physical activity and fitness, although NICE urges caution as there is a shortage of well designed studies showing what is effective. The development of new cycling and walking paths appears to encourage the use of these paths. Again NICE urges caution due to the lack of high quality long-term studies. Using the environment as a point of active choice (e.g. using stairs not the lift), with the support of written media (e.g. stair posters, riser banners on steps), can have a short-term effect for up to 3 months.

Norwegian research undertaken for the Norway Department of Health recommends that schemes aimed at groups of children and young people are more effective than schemes that target individuals. Measures have even greater impact if several schemes are initiated at the same time. Measures are also more effective if they take into account the environment the children spend time in. For example, the physical design of the school playground can be changed to encourage more games and activity;

at the same time PE classes can focus on stimulating more physical activity and developing motor skills. When planning new measures, it is important to consider the total social network that children and young people belong to and the kind of physical environment in which they live and socialise. The best effects will therefore be achieved if the home, school and after-school clubs work together to ensure more physical activity – on school days and at the weekends.



Current Government plans and initiatives

The UK Government has set a target to halt the rise in childhood obesity in those aged under 11 by 2010 (“but no system is in place to ascertain if this has been achieved”⁷).

The Government’s latest cross-departmental obesity strategy ‘Healthy weight, healthy lives’ was launched in 2008. It encourages children to “eat well and enjoy being active” and supports their parents with “the provision of the necessary knowledge and confidence to ensure that children eat healthily and are active and fit”. For parents, this includes support for breastfeeding, extra parental help “through childrens’ centres, health services and their local communities”, and identification of at-risk families as early as possible.

Specific projects include:

- Providing parents with their child’s results from the National Child Measurement Programme
- Making cooking a compulsory part of the curriculum by 2011 for all 11–14 year-olds
- Asking all schools to develop healthy lunch box policies
- Tailored programmes in schools to increase the participation of obese and overweight pupils in PE and sporting activities
- A £75 million investment in an evidence-based marketing programme to improve children’s diets and levels of physical activity.

The UK Government Change 4 Life programme is encouraging healthy lifestyles for families through an advertising campaign and a website with access to information about physical activity and local facilities.

There is a school pedometer programme which will see 250 schools in deprived areas across the country be given 45,000 pedometers, to encourage children to become more active.

Games and toys

There are a number of games on the market which are designed to encourage children to keep fit. These include Wii, Wii Fit and Fizzee - a new ‘tamagotchi-style’ digital pet which is nurtured and developed through the activity undertaken by the child wearing it. The device measures heart rate and motion, and uses a scoring system based on recommended exercise levels for young people, to determine the health of the Fizzee. The more exercise

undertaken, the healthier the digital pet. Equally Nintendo’s Walk With Me uses ‘fun’ mini-games to encourage players to be more active, for example world data can be used to chart a walk through the solar system. The Swinx games console is designed for physical activities. However, these options may not be accessible to lower income families.

In a local NHS innovation, designed book bag tags were distributed to children to encourage physical activities. Websites, such as Kids Exercise, make information available for families on different activities.

New web-based software (called Synchronised Nutrition and Activity Program - SNAP) has been shown to be much more effective in encouraging children to report physical activity and dietary intake than standard questionnaires and so this approach could play an important role in more effective monitoring of obesity problems⁸.

Carbon output

The NHS in England has a current carbon output of 19m tons each year – we estimate that the East of England contributes approximately 2m tons a year. Healthcare related travel contributes 18% to the carbon output of the NHS and this could be dramatically reduced by solutions that allow remote care.

Reducing the carbon output of healthcare will reduce costs in the NHS by saving energy, reducing taxation relating to carbon taxation or carbon accounts as part of the Climate Change Act, reducing the costs of system inefficiency and waste disposal. We anticipate that the innovations developed through this SBRI programme will aim to reduce carbon output for the treatments they affect by 10%, when fully adopted, by a combination of both direct and indirect factors such as reduced travel (distance, frequency, and mode), duration of stay as an inpatient, and the carbon-efficient manufacture of devices.



⁷The TRENDS Project: development of a methodology to reliably monitor the obesity epidemic in childhood. ⁸The development and evaluation of a novel computer program to assess previous-day dietary and physical activity behaviours in school children: the Synchronised Nutrition and Activity Program (SNAP).

Scope

The scope for this competition is broad and open. Whilst there are many plans for action in the areas of prevention, screening and advice, and some games and devices available, these are at an early stage. Industry may well be able to offer affordable proposals which can help and motivate children to take more exercise, to understand and monitor the amount of exercise they are taking and to make them want to exercise more.

All applications will be expected to demonstrate their impact on carbon reduction and sustainable development. Innovations will need to support models of care that contribute to lowering carbon output from healthcare. This reduction may be achieved through reduced travel (by patients and/or healthcare professionals), reduced intensity of treatment, reduced hospitalisation, or reduced use of medical devices.

Application process

This competition is part of the Technology Strategy Board's SBRI programme which aims to bring novel solutions to Government departments' issues by engaging with innovative companies that would not be reached in other ways:

- It enables Government departments and public sector agencies to procure new technologies faster and with managed risk
- It provides vital funding for a critical stage of technology development through demonstration and trial – especially for early-stage companies.

The Technology Strategy Board brokers the open and transparent competition which will result in direct contracts between successful companies and NHS East of England.

The SBRI scheme is particularly suited to small and medium-sized businesses, as the contracts are of relatively small value and operate on short timescales for Government departments. It is an opportunity for new companies to engage a public sector customer pre-procurement. The intellectual property rights are retained by the company, with certain rights of use retained by NHS East of England.

Phase 1 is intended to show the technical feasibility of the proposed concept, and the development contracts placed will be for a maximum of 6 months and £100,000 per project. Phase 2 contracts are intended to develop and evaluate prototypes or demonstration units from the more promising

technologies in Phase 1, and it is anticipated that funding will be £250k-750k. At this stage contracts will be let for Phase 1 only. Phase 2 is dependent upon successful completion of Phase 1 and will go to the most successful Phase 1 contracts. However, suppliers should state now their goals and outline plan for Phase 2 as an explicit part of the path to full commercial implementation in their Phase 1 proposal.

The application process is run through Health Enterprise East, the NHS Innovation Hub for the East of England. All applications should be made using the application forms which can be downloaded from www.hee.org.uk.

Please email your forms to: enquiries@nhsinnovationeast.org.uk by 12 noon on 30 June 2009 and return a signed paper copy of the application form by 5pm on 3 July 2009 to the following address:

Health Enterprise East, CTBI, Papworth Hospital, Papworth Everard, Cambridge CB23 3RE.

Companies will be expected to mobilise rapidly to start the project and payments will be made quarterly in advance against the agreed budget. It is important that projects run concurrently in order to make a fair assessment and move rapidly on to Phase 2 with those chosen.

Key dates

Competition launch	22 April 2009
Deadline for applications	30 June 2009
Assessment	July 2009
Feedback provided by	August 2009
Contracts awarded	September 2009

More information

For more information on this competition, visit:

www.hee.org.uk.

For any enquiries, e-mail:

enquiries@nhsinnovationseast.org.uk

For more information about the SBRI programme, visit:

www.innovateuk.org/sbri

For more information about the Technology Strategy Board, visit:

www.innovateuk.org

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The Technology Strategy Board is a business-led executive non-departmental public body, established by the government. Its role is to promote and support research into, and development and exploitation of, technology and innovation for the benefit of UK business, in order to increase economic growth and improve quality of life.