

<b>Institution: Sheffield Hallam University</b>
<b>Unit of Assessment: 26 Sport and Exercise Sciences, Leisure and Tourism</b>
<b>Title of case study: A Behaviour Change DVD to Increase Physical Activity in Deprived Neighbourhoods - from concept to community</b>
<p><b>1. Summary of the impact</b></p> <p>This case study describes the research pathway and impact of a behaviour change DVD designed to increase physical activity in sedentary individuals in deprived communities. Developed as part of a randomised controlled trial with the National Institute for Health Research's Health Technology Assessment programme (HTA), together with supporting research expertise, the DVD is now part of NHS/local authority commissioned standard care in Barnsley and has reached over 7,000 individuals and families. Service evaluation data confirm the DVD has significantly improved the cardiovascular risk profiles of users and contributed to a population level rise in physical activity in Barnsley.</p>
<p><b>2. Underpinning research</b></p> <p>The annual costs of obesity and physical inactivity in England are estimated at £10.7 billion (Department of Health, 2004). The challenge in getting individuals to become more active, more often, remains a public health priority. Recently the evidence base for brief interventions to promote physical activity in primary care has been reviewed (NICE, 2006). This review pointed to a sufficient evidence base for NICE to recommend the use of brief interventions to promote physical activity, but also identified specific evidence gaps, particularly in relation to cost-effectiveness of interventions, delivery costs to the NHS and the challenge of engaging those most in need of brief advice. In July 2008, researchers at Sheffield Hallam University (SHU) were awarded a National Institute for Health Research - Health Technology Assessment (HTA) grant (grant a), in partnership with University of Sheffield (UoS) to explore the effectiveness of physical activity 'Booster' sessions (telephone-based motivational interviewing or full-booster face-to-face motivational interviewing) to help maintain physical activity in previously sedentary individuals in deprived communities in Sheffield. The HTA has a rigorous scientific and peer review process. Copeland (site Principal Investigator), Breckon and Crank from SHU designed and delivered the physical activity counselling Booster interventions and designed an innovative behaviour change DVD (informed by references 4 and 5) as a brief intervention designed to increase physical activity in the target population. UoS researchers undertook trial management and the effectiveness and cost-effectiveness analysis.</p> <p>The 'Booster' trial was carried out in two phases: a feasibility study to establish the acceptability of the DVD and determine recruitment rates (reference 3); and a three arm randomised controlled trial to establish effectiveness and cost-effectiveness (reference 2). After watching the DVD 79% of eligible participants successfully increased their physical activity by at least 30-minutes per week, making them eligible for the booster interventions. In the main trial, three months after receiving the DVD, 50.8% successfully increased their physical activity.</p> <p>Results from the main trial showed a mean total energy expenditure (TEE) (KCal) per day difference of 39.0 Kcal (2265 KCal vs. 2226.9 KCal; 95%CI: -173.4 to 95.4; p=0.567) in favour of the DVD (identified in the trial as the control arm of the study) compared to Booster interventions combined. The observed mean difference in mean TEE per day was similar and consistent in favour of the DVD group even after adjusting for age, sex, BMI, total minutes of physical activity at brief intervention and pre-trial screening, and health related quality of life based on SF12 total scores. The HTA study provided a robust evidence-base that supported the use of the DVD tool to access hard-to-reach populations in need of brief health intervention.</p> <p>In order to meet policy and practice needs, members of the SHU team drew on their physical activity research expertise further to inform the design of the DVD. Crank was a co-author on the expert physical activity consensus statement (reference 1). Breckon's expertise as an international motivational interviewing trainer (MINT) and Copeland's expertise in behaviour</p>

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change interventions in overweight and obesity research (reference 6) ensured that only peer-reviewed content and behaviour change techniques consistent with NICE (2007) guidance were adopted.

The key researchers, their positions at the time of the research and their current status are as follows:

Dr Robert Copeland: joined SHU 4/3/2002, Principal Research Fellow at the time of the research; currently Reader, from 2012

Dr Jeff Breckon: joined SHU 1/1/2004, Principal Research Fellow at the time of the research; currently Reader, from 2010

Dr Helen Crank: joined SHU 16/10/2002, Senior Research Fellow at the time of the research; currently Principal Research Fellow, from 2011

### 3. References to the research

1. O'Donovan, G., Blazevich, A. J., Boreham, C., Cooper, A. R., Crank, H., Ekelund, U., Fox, K. R., Gately, P., Giles-Corti, B., Gill, J. M. R., Hamer, M., McDermott, I., Murphy, M., Mutrie, N., Reilly, J. J., Saxton, J. and Stamatakis, E. (2010) The ABC of Physical Activity for Health: a consensus statement from the British Association of Sport and Exercise Sciences, *Journal of sport sciences*, 28 (6), 573-591. Scopus SJR 0.909. Crank REF output 4. Cited 176 times (Google Scholar - 16/09/2013) - a top ten cited journal paper in the current REF impact window. <http://dx.doi.org/10.1080/02640411003671212>
2. Hind, D., Scott, E.J., Copeland, R. J., Breckon, J.D., Crank, H., Walters, S.J., Brazier, J.E., Nicholl, J., Cooper, C. & Goyder, E. (2011) Study Protocol: A randomised controlled trial and cost-effectiveness evaluation of "booster" interventions to sustain increases in physical activity in middle-aged adults in deprived urban neighbourhoods. *BMC Public Health*, 10 (3). Scopus SJR 0.886. Breckon REF output 2. DOI:10.1186/1471-2458-10-3. <http://www.biomedcentral.com/content/pdf/1471-2458-10-3.pdf>
3. Scott, E.J., Munyaradzi D., Hind, D., Goyder, E., Copeland, R. J., Breckon, J.D., Crank, H., Walters, S.J., Loban, A., & Cooper, C. (2010) "Booster" interventions to sustain increases in physical activity in middle-aged adults in deprived urban neighbourhoods: internal pilot and feasibility study. *BMC Public Health*. 11:129. Scopus SJR 0.886. DOI: 10.1186/1471-2458-11-129 <http://link.springer.com/content/pdf/10.1186%2F1471-2458-11-129.pdf>
4. Hutchinson, A.J., Breckon J.D. and Johnston, L. H. (2009) Physical activity behavior change interventions based on the transtheoretical model: a systematic review. *Health education & behavior*, 36 (5), 829-845. Scopus SJR 0.791. Cited 55 times (Google Scholar - 16/09/2013) DOI: 10.1177/1090198108318491. <http://heb.sagepub.com/content/early/2008/07/07/1090198108318491.full.pdf+html>
5. Breckon, J.D., Johnston, L. H. and Hutchinson, A. (2008) Physical activity counselling content and competency: a systematic review in middle-aged adults in deprived urban neighbourhoods. *Journal of Physical Activity and Health*, 5 (3), 398-417. Scopus SJR 0.952. Breckon REF output 3. <http://journals.humankinetics.com/AcuCustom/SiteName/Documents/DocumentItem/15708.pdf>
6. Daley, A. J., Copeland, R. J., Wright, N. P., Roalfe, A., & Wales, J. K. (2006). Exercise therapy as a treatment for psychopathologic conditions in obese and morbidly obese adolescents: A randomized, controlled trial. *Pediatrics*, 118, 2126-2134 Scopus SJR 2.544. Cited 55 times. <http://pediatrics.aappublications.org/content/118/5/2126.full.pdf+html>

Grants associated with the research:

- a. A randomised controlled trial and cost-effectiveness evaluation of "booster" interventions to sustain increases in physical activity in middle-aged adults in deprived urban neighbourhoods. Health Technologies Assessment [07/25/02]. £1.2million. (July 2008 - June 2012). (Site PI Copeland).

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- b. Effectiveness of a physical activity behaviour change programme for overweight individuals and their families in nine deprived areas of Barnsley. NHS Barnsley £1.1million. (August 2009 - December 2012). (PI Copeland).

**4. Details of the impact**

The 'Booster' trial research confirmed the efficacy of a DVD intervention to promote physical activity in sedentary individuals in deprived areas. This research evidence led Drs Copeland and Crank to produce another DVD intervention as part of a Barnsley NHS/local authority commissioned service in 2009 (grant b). The service - 'Be Active' (designed, delivered and project managed by SHU staff - Copeland and Crank) - represented a community based behaviour change intervention to increase physical activity in overweight individuals and their families in nine of the most deprived areas of Barnsley. Barnsley has been identified as a borough of poor health with 34% (67,000 individuals) of the adult population estimated to be overweight and a further 73,000 obese. Furthermore, the 2008/9 Active People Survey ranked Barnsley in the bottom 25% nationally for participation in regular activity.

The primary objective of 'Be Active' was to increase the physical activity of overweight adults and to reduce their cardiovascular risk. A total of 7,206 individuals from 4,815 households in the most deprived areas of Barnsley received a copy of the DVD. According to a senior officer at Barnsley Metropolitan Borough Council (MBC) (source i below) *"this was a considerable achievement, bearing in mind that all of these people were considered to be hard to reach"*. Of all participants, 72% were female and the mean age of recipients was 38 years. The impact of the DVD was assessed as part of an overall service evaluation conducted by SHU (see end of section for reference).

In sum, 92% of individuals self-reported watching the DVD, of whom 93% confirmed they were more active as a result. Data also revealed a significant and beneficial effect over time of the programme, for weight ( $p=0.001$ ), BMI ( $p=0.001$ ), waist circumference ( $p=0.001$ ) and blood pressure (systolic:  $p=0.001$  and diastolic  $p=0.003$ ). In real terms this equates to a mean weight loss per person of 3kg, a reduction in waist circumference of over 4cm, and a fall in BMI of 0.95units. Importantly, the 'Be Active' data is also based on a relatively long term follow-up (6 months). A senior manager from Small Changes Ltd (source ii) who also delivers weight management services in Barnsley reported *"the long-term changes noted in the data are encouraging and underline the impact of the DVD on the maintainance of behavioural changes made by participants. Sustained change is likely to have a positive and lasting impact on the health profile of some of the most challenging areas of Barnsley"*. Case studies from the programme can be seen at <http://beactive.org.uk/case-studies/> along with other 'active ingredients' from the DVD which has been translated into an on-line format and embedded within Barnsley MBC's leisure services programme (see [www.beactive.org.uk](http://www.beactive.org.uk)). This work was also undertaken by Copeland and Crank and has enhanced the reach and sustainability of the intervention.

In broader terms, data from Sport England's Active People Survey highlight the contribution 'Be Active' made towards adult physical activity participation in Barnsley. The data for Barnsley showed an increase from 19.1% to 22.4% of adults participating in 3 x 30 minutes physical activity per week (National Indicator 8 - Change between APS1 (Oct05-Oct 06) and APS4/5 (Oct 09-Oct 11)). To strengthen this evidence, trend data from Department of Health (2011) taken between 2009 and 2011 (the time period of 'Be Active') confirms physical activity in adults increased from 8.3% to 12.1%. This places Barnsley above the national average for the first time. Whilst causal links between physical activity increases in Barnsley and 'Be Active' must be treated with caution (in that we did not control for extraneous variables within the research design), the data is nevertheless encouraging. Moreover, as inferred by the testimony above from the senior officer at Barnsley MBC (source i below), the DVD approach had a positive and significant impact on the reach of local service providers (i.e. NHS Barnsley, Active Barnsley, Barnsley FC, Barnsley MBC) by providing each of these with an evidence-based 'behaviour change tool' to engage typically hard-to-reach communities. In doing so 'Be Active' supported the aforementioned agencies to meet health improvement targets specified within Department of

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Health, local NHS and Public Health England outcome frameworks.

This impact is further corroborated by a Senior Health Improvement Specialist from Barnsley MBC (Source iii below) who suggested *“the Be Active programme not only demonstrated a significant impact on those who were in receipt of the programme (in terms of their health profile) but also on those who are connected to the delivery of physical activity services across Barnsley. I can say with confidence that introducing an evidence-based approach to engendering physical activity behaviour change through the DVD, positively influenced the culture of provision in the Borough as well as framing policy decisions and commissioning approaches moving forwards. Providers and commissioners of services in Barnsley are working differently as a result of ‘Be Active’ and this is one of the key achievements of the programme”*.

The impact of the research informing the 'Be Active' DVD also has a broader reach, driven by the following:

- Publication in a practice-based journal with a circulation list of 5,500 (Copeland, R.J., Crank, H, Hall, A., & Millbourn. (2010). Be Active: Promoting physical activity in overweight people. Practice Nursing, 21: 569 - 573);
- Presentations at national and local conferences in public health attended by General Practitioners, Commissioners of obesity treatment services and policy makers within local authorities (Copeland, R.J., (2010). Tackling obesity through physical activity - Be Active: Diabetes UK, Huddersfield; Lyons, N. Gibson, D. Copeland, R. Crank, H. Reece, L. Hall, A. Simper, T. Whitfield, M. (2010) A community physical activity intervention, Faculty of Health and Wellbeing Conference. Sheffield);
- The publically available service evaluation report (Copeland, R.J., Crank, H, Lyons, N. & Gibson, D. (2011). *Be Active: A community based approach to promoting physical activity in overweight individuals. Evaluation Report* - <http://shura.shu.ac.uk/view/creators/3538.html>)
- A workforce wellbeing programme to increase physical activity in the NHS supported by the Yorkshire and Humber Academic Health Science Network. The programme utilises elements of the brief intervention DVD as part of a broader on-line and face-to-face programme of behaviour change for NHS staff. £265,000 (January 2013). (PI Copeland).

### 5. Sources to corroborate the impact

- i) Senior officer, Development, Environment and Culture, Barnsley Metropolitan Borough Council
- ii) Senior manager, Small Changes (Healthcare) Ltd
- iii) Health Improvement Specialist, Barnsley MBC