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## Knowledge Exchange Seminar Series (KESS)

# The importance of doing regular physical activity to health, society and the economy: Time for a major re-think

## POLICY BRIEFING

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### Introduction

Physical activity levels have been steadily decreasing over the last few decades. The role of physical activity in preventing non-communicable diseases, including obesity, heart disease and certain cancers, is increasingly recognised. International health bodies have called for urgent

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action to tackle the global pandemic of physical inactivity. In addition to the traditional approaches of education and individual support to change activity, social and physical environments need to be addressed to create a context for behaviour change. The aim of this policy briefing is to describe recent advances in physical activity research that might help address the concerning levels of physical inactivity in Northern Ireland.

## Physical Activity and Health

Non-communicable diseases, such as heart disease and diabetes, place a huge burden on the NHS. According to the World Health Organisation (WHO) they accounted for nearly 60% of all deaths annually in 2001.<sup>1</sup> Rising levels of physical inactivity has become recognised as one of the major threats to public health, and it is estimated that in 2008 physical inactivity caused 9% of premature mortality and 5.3 million deaths worldwide, making it the fourth leading cause of death globally.<sup>2</sup> This estimate included between 6% and 10% of all deaths from major non-communicable diseases globally and their burden continues to increase rapidly in low- and middle-income countries.<sup>3</sup> Physical activity accounts for a similar number of global deaths as smoking, but there have been fewer organised efforts to combat it.<sup>4</sup>

Regular physical activity has been shown to contribute to the prevention and management of over 20 chronic health conditions, including heart disease, stroke, diabetes, cancer, obesity and musculoskeletal conditions as well as mental health problems.<sup>5</sup> In addition to the benefits to physical health, regular physical activity contributes to the prevention of falls and cognitive function in older adults, and academic achievement in young people.

It has been estimated that physical inactivity costs the NHS £1.06 billion through its direct contribution to coronary heart disease, stroke, diabetes, colorectal cancer and breast cancer.<sup>6</sup> In addition to the health costs, inactivity has been estimated to have wider societal economic costs of £5.5 billion per year from sickness absence from work and £1 billion per year from the premature death of people of working age.<sup>7</sup> Finally, promoting active modes of travel such as walking and cycling to work and school can contribute to reducing harmful air pollution and greenhouse gas emissions. However, there has been minimal investment researching effective ways to encourage physical activity uptake within the UK.<sup>8</sup>

## Levels of Physical Activity

Despite the numerous benefits of physical activity, levels remain low. In Northern Ireland, two thirds of adults do not participate in enough physical activity to confer a health benefit, including a third of the population who participate in no physical activity at all.<sup>9</sup> This is similar to the rest of the UK and worldwide. Every adult should aim to be active daily, aiming to accumulate at least 150 minutes of moderate intensity activity per week.<sup>5</sup> A concerning global trend of rapidly decreasing physical activity levels in low and middle income countries have led to some calling our current situation a “physical inactivity pandemic”.<sup>10</sup> Physical activity levels decline with age, and lifelong patterns are likely to be laid down in youth. A recent report indicated that 66% of children in Northern Ireland do not meet the recommended level of physical activity, which has worrying consequences for the future.<sup>11</sup> It is recommended that all children and young people should engage in moderate to vigorous intensity physical activity for at least 60 minutes and up to several hours every day.

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## Reasons for Low Physical Activity Levels

Research has demonstrated that there are three main levels of influence on physical activity levels: individual; social and environmental.<sup>12</sup> Individual factors include attitudes to physical activity, social and health inequalities, and beliefs about the benefits of physical activity and in an individual's belief in the ability to change their lifestyle. In addition, social influences such as support of family and friends influence activity.

More recent focus has been on the effects of the built environment on physical activity. Considerable evidence is mounting on the association between physical activity and the built environment in which an individual lives.<sup>13</sup> Features of the built environment associated with increased physical activities such as walking and cycling include greater land use mix, street connectivity, presence and conditions of sidewalks and street lighting.<sup>14</sup> Individual's perceptions of the support offered by their local neighbourhood for physical activity is also associated with levels of activity. These include perceived safety, residential density, aesthetics and proximity of facilities for walking and cycling.

## Interventions: Time for a Re-think

Previous initiatives have had only modest effects, with maintained changes in physical activity behaviour being difficult to achieve.<sup>15-17</sup> Thus the Public Health White Paper<sup>18</sup> called for a major re-think in our approach to public health interventions. Given the limited effect of previous efforts we need to develop more innovative approaches to halt the global rise in physical inactivity if these recommendations are to be realised.<sup>17</sup>

### *Individual Level Approaches*

Previous government led efforts to address physical inactivity have largely focused on health promotion efforts within organisation settings such as schools, workplaces and healthcare settings. These interventions have primarily targeted the individual level factors associated with inactive lifestyles, including education. Recent guidelines from the National Institute of Health and Care Excellence (NICE) has recently recommended that interventions should include techniques that have been shown to be effective at changing behavior, including setting goals, giving feedback and monitoring progress, and providing social support.<sup>19</sup> There have been a number of examples of successful interventions in Northern Ireland. We have successfully promoted changes in physical activity, through the use of small devices called pedometers which help people set goals. These interventions led to significant improvements in health and wellbeing in a variety of populations including primary care patients,<sup>20</sup> workplaces<sup>21</sup> and university students.<sup>22</sup> However they are notable for their limited ability to sustain behaviors beyond the timeframe of the intervention. This may be because they focused on individual level factors, and omitted to intervene in either the social or physical environmental context in which the behavior occurs.

"Nudge" policies and the use of incentives have been advocated by the UK Government to encourage the adoption of healthy lifestyles.<sup>18</sup> Although this has captured the imagination of policy makers, others are concerned that without specific evidence it may be implemented too widely to the detriment of alternative approaches.<sup>23</sup> Certainly more behavioural economists are beginning to research the role of incentives for healthy behaviours, such as physical activity, with promising results for changing some behaviours, for example, smoking, substance abuse, but the evidence for other health behaviours is sparse.<sup>23</sup> Some financial<sup>24</sup> and non-financial incentives<sup>25</sup> have been shown to increase levels of physical activity, at least in the short term and mainly with respect to structured exercise programme, rather than free-living physical activity.

Research conducted locally aims to address such gaps in the evidence base, including how individual interventions interact with environmental factors in encouraging people to walk, how to

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make walking habitual and elucidating factors that influence longer term behaviour change.<sup>26</sup> The Physical Activity Loyalty (PAL) scheme is a multi-component intervention based on concepts similar to those that underpin a high-street loyalty card aimed at encouraging repeated behaviour (i.e. loyalty). Components include the provision of points and rewards (financial incentives) contingent on the targeted behaviour (physical activity), and the provision of feedback on the targeted behaviour, prompting and messaging to encourage the targeted behaviour, through a tailored website.<sup>27</sup>

Using a loyalty card to collect points and earn rewards, participants (n=199) in the Incentive Group monitored their physical activity levels and received financial incentives (retail vouchers) for minutes of physical activity completed over the course of a 12-week intervention period. Participants (n=207) in the comparison group used their loyalty card to self-monitor their physical activity levels but were not able to earn points or obtain incentives (No Incentive Group). Quality of life (QOL) and absenteeism were assessed at baseline and 6 months follow-up. Results from a cost-effectiveness analysis showed that the PAL Scheme is potentially cost-effective from both a healthcare and employer's perspective. It is based on a sustainable "business model" which should become more cost-effective as it is delivered to more participants and can be adapted to suit other health behaviours and settings. This comes at a time when both UK and US governments are encouraging business involvement in tackling public health challenges.<sup>28</sup>

For financial incentive schemes to be worthwhile in the longer term and implemented on a large scale, they must be based on a sustainable model. Previous studies have used significant cash payments (up to \$750) which are not sustainable for the long term. The ready "buy-in" of the retail partners in our study suggests that a sustainable model could be achievable.<sup>27</sup> Such schemes could provide a "win-win" situation for both public health and businesses by offering modest financial incentives, such as for retail vouchers, in return for an increased number of customers for local retailers, which is aligned to precepts of the Public Health Responsibility Deal.<sup>18</sup>

## *Population Level Approaches*

However, public health specialists have long recognised that berating individuals to change their behaviour seldom works and have adopted a broader approach which recognises the role of supportive environments that can make healthy choices easier. However, physical activity is a complex behaviour, and modern built and social environments discourage it. The government can facilitate population level behaviour change by providing supportive environments. The potential of the built environment to influence population levels of physical activity was recognised by the World Health Organisation,<sup>3</sup> and the UK Foresight report.<sup>29</sup>

The UK Foresight report<sup>29</sup> highlighted the need for evidence of the effectiveness of environmental interventions to help to sustain behaviour changes. There have been large government commissioned reviews of approaches for promoting and creating environments that encourage and support physical activity in the UK.<sup>30</sup> These reviews recognised that past policy and practice has prioritised sedentary modes of transport, albeit not intentionally. Based on systematic reviews of policy, transport, urban planning and architecture, NICE<sup>30</sup> identified a number of recommendations for practice, including changes to planning, transport and design, in order to improve the accessibility to opportunities to incorporate physical activity into activities of daily living. NICE also recommended that research councils and funders should prioritise funding for the evaluation of effectiveness of environmental interventions on physical activity, which has led to an upsurge of research activity in the area. However, there is a dearth of evidence regarding the impact of urban regeneration projects on public health, particularly the nature and degree to which urban regeneration impacts upon health-related behaviour change.

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Research currently being conducted locally is seeking to address this knowledge gap. The Connswater Community Greenway (<http://www.communitygreenway.co.uk>) in Belfast is a major urban regeneration project involving the development of a 9 km linear park, including the provision of new cycle paths and walkways. In addition to the environmental improvements, this complex intervention involves a number of programmes to promote physical activity in the regenerated area. The Connswater Community Greenway provides a significant opportunity to achieve long-term, population level behaviour change, and affords a unique opportunity to investigate the public health impact of urban regeneration. Urban regeneration may be conceptualised meaningfully as a complex intervention comprising multiple components with the potential, individually and interactively, to affect the behaviour of a diverse population.

The PARC (Physical Activity and the Regeneration of Connswater) Study<sup>31</sup> is a natural experiment investigating the public health impact, including physical activity behaviour, health and mental wellbeing, of the Greenway on the local population. Key components include: (1) a quasi-experimental before-and-after survey of the Greenway population (repeated cross-sectional design), in tandem with data from a parallel Northern Ireland-wide survey for comparison; (2) an assessment of changes in the local built environment and of walkability using geographic information systems; (3) semi-structured interviews with a purposive sample of survey respondents, and a range of community stakeholders, before and after the regeneration project; and (4) a cost-effectiveness analysis. More specifically, this study will add to the much needed evidence-base about the impact of urban regeneration on public health.

By use of modelling techniques, the effect of programmes or policies on population health or population subgroups can be assessed from the outset. Using the macro-simulation PREVENT model, the potential health impacts and cost-effectiveness of the Connswater Community Greenway were estimated.<sup>32</sup> We modelled its potential impact on the burden from cardiovascular disease, namely, ischaemic heart disease, type 2 diabetes mellitus and stroke, and colon and breast cancer, by the year 2050, if feasible increases in physical activity were to be achieved. Results demonstrated that if 10% of those classified as 'inactive' (perform less than 150 minutes of moderate activity/week) became 'active', 886 incident cases (1.2%) and 75 deaths (0.9%) could be prevented with an incremental cost-effectiveness ratio (ICER) of £4469/disability-adjusted life year. For effectiveness estimates as low as 2%, the intervention would remain cost-effective (£18 411/disability-adjusted life year). Small gains in average life expectancy and disability-adjusted life expectancy could be achieved, and the Greenway population would benefit from 46 less years lived with disability. Therefore, the Greenway could be cost-effective at improving physical activity levels. Although the direct health gains are predicted to be small for any individual, summed over an entire population, they are substantial. In addition, the Greenway is likely to have much wider benefits beyond health, including reductions in carbon emissions, improvements in safety, and less crime.

## **Global Charter for Physical Activity**

In 2011, following a meeting of international experts, the Toronto Charter for Physical Activity was introduced ([www.globalpa.org.uk](http://www.globalpa.org.uk)). This is a call for governments to create sustainable opportunities for physically activity for all. This Charter calls for concerted action across four areas, seen as the building blocks for successful population change. This action should involve governments, civil society, academic institutions, professional associations, the private sector, and other organisations within and outside the health sector, as well as communities themselves.

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The four key areas are:

<b>1. IMPLEMENT A NATIONAL POLICY AND ACTION PLAN</b>	A national policy and action plan should provide direction, support and coordination for the many sectors involved. It should assist in focusing resources as well as providing accountability.
<b>2. INTRODUCE POLICIES THAT SUPPORT PHYSICAL ACTIVITY</b>	A supportive policy framework and regulatory environment are required to achieve sustainable changes in government and society. Policies that support health enhancing physical activity are needed at national, regional and local levels.
<b>3. REORIENT SERVICES AND FUNDING TO PRIORITIZE PHYSICAL ACTIVITY</b>	In most countries, successful action to promote physical activity will require a reorientation of priorities in favour of health enhancing physical activity. Reorienting services and funding systems can deliver multiple benefits including better health, cleaner air, reduced traffic congestion, cost saving and greater social connectedness.
<b>4. DEVELOP PARTNERSHIPS FOR ACTION</b>	Actions aimed at increasing population-wide participation in physical activity should be planned and implemented through partnerships and collaborations involving different sectors, and communities themselves, at national, regional and local levels.

The cross-departmental strategy “A Fitter Future for All”<sup>33</sup> echoes some of these sentiments, but without a concerted effort to directly target physical activity in all relevant policies and actions, physical inactivity and its consequences will remain.

## Conclusions

Physical inactivity is a major public health concern, with implications for our health, society and economy. Therefore, the public health dividend of increasing physical activity in the population is substantial. Previous initiatives have had only modest effects, with maintained changes in physical activity behaviour being difficult to achieve. Thus a major re-think in our approach is required. The government can facilitate population level behaviour change by providing supportive environments. Therefore, there is a need to move beyond individual level approaches towards broader population interventions that provide a supportive social and built environment. In order to facilitate this shift, physical activity should be integrated into cross-departmental policies. The current Northern Ireland strategy for preventing and addressing overweight and obesity, “A Fitter Future for All”,<sup>33</sup> calls for cross-departmental action to tackle the ‘obesogenic’ environment, including policies to support physical activity choices.

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