The Research Project

The UKCRC Centre of Excellence for Public Health (NI) led a multidisciplinary team to win a prestigious Medical Research Council award to evaluate the Connswater Community Greenway (CCG) (**www.communitygreenway.co.uk**) and its impacts on physical activity and the health of the local population in east Belfast.

Increasing participation in physical activity has great potential for improving public health. The current guidelines recommend that all adults should undertake a minimum of 150 minutes per week of at least moderate-intensity physical activity (makes you slightly out of breath). Physical activity can help prevent the occurrence of many chronic diseases, such as heart disease, some cancers, and diabetes. In fact, if an adult meets the current physical activity recommendations they can decrease their chances of heart disease by up to 50% and colon and breast cancer by 25-30%. Yet, less than 40% of adults in Northern Ireland actually achieve this level. Therefore we need to find new, effective ways to get more people, more active, more often.

This issue of the PARC Study ezine will summarise some of the key findings from three papers that have been accepted in academic journals. For more information about these papers click **here**. We also highlight Prof Geraint Ellis' research on an exciting new 'walkability' tool.

Update on the Connswater Community Greenway

The contract to deliver the first phase of the £35 million Connswater Community Greenway project has been awarded to BSG Civil Engineering Ltd. The first phase will focus on Orangefield and Victoria Parks and includes the creation of 3 km of new paths, three new bridges for pedestrians and cyclists as well as landscaping, and public realm work including street furniture and lighting. The contract will also deliver a significant part of the £11 million East Belfast Flood Alleviation Scheme, offering local residents better protection from flooding. Work on this first phase commences in June and is due to finish next year.

*Keep up to date with the Connswater Community Greenway: **www.communitygreenway.co.uk**;*

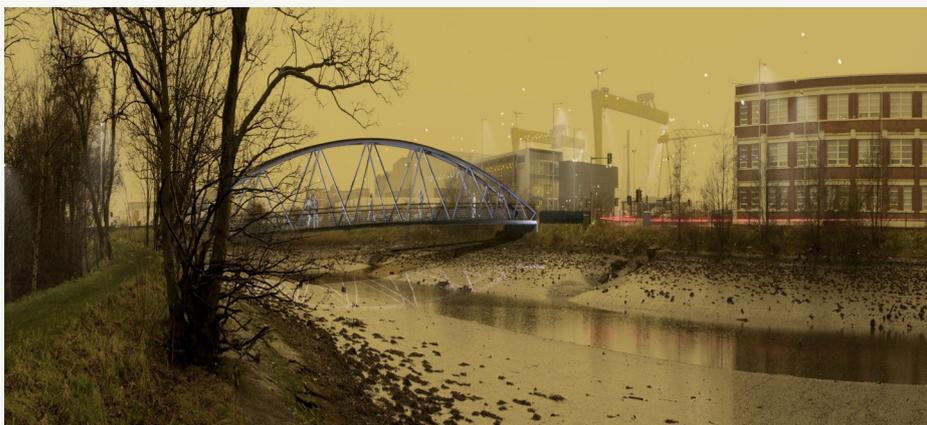| Inside this issue:	
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Figure 1: The planned new bridge in Victoria Park

Urban Greenways have the Potential to Increase Physical Activity Levels Cost-effectively

What we aimed to do:
To estimate the potential health impacts of the CCG (Figure 2) if those living nearby used the new Greenway to do more physical activity and to consider whether the CCG could be a cost-effective investment for public health.

What we did:
Over 1200 local residents living near the proposed Greenway area were asked to complete a questionnaire asking about how much physical activity they undertook, their current health and mental wellbeing. We then proposed 3 hypothetical scenarios where, as a result of the Greenway, the proportion of local residents doing at least 150 minutes per week of physical activity increased by 2%, 5% or 10%. In the next stage we used a model to estimate how many new cases and deaths from heart disease, breast and bowel cancer could be prevented, over the next forty years, if these percentage increases in physical activity levels were achieved. The model also predicted the gains in life expectancy and the number of years lived free of disease or disability by the beneficiaries of the Greenway.

By calculating the total cost savings through diseases prevented for each scenario and taking these away from the total construction and maintenance costs of the Greenway we obtained the net cost of the CCG per scenario. Then by dividing the net costs by the health benefits gained, we obtained a cost-effectiveness ratio for each scenario. Typically, the UK healthcare sector considers any intervention less than £20,000-£30,000/DALY (Disability-adjusted Life Year) to be cost-effective.

What we found:
If just 2% of those people living nearby the Greenway who are currently inactive, did at least 150 minutes/week of physical activity as a result of the CCG, over 40 years, then a total of 184 new cases of chronic diseases (Figure 3) and 17 deaths could be prevented.

If 10% of those people who are currently inactive became active, over 40 years, then a total of 886 new cases of chronic diseases and 75 deaths could be prevented.

We found all three scenarios to be cost-effective ranging from £4,469/DALY to £18,411/DALY, which is well below the UK cost-effectiveness threshold.

Why this is important:
We have shown that environmental interventions, such as the Connswater Community Greenway, could be a cost-effective way to increase physical activity levels, prevent major chronic diseases and decrease healthcare expenditure.

Citation: Mary A.T. Dallat, Isabelle Soerjomataram, Ruth F. Hunter, Mark A. Tully, Karen J. Cairns, Frank Kee. Urban greenways have the potential to increase physical activity levels cost-effectively. European Journal of Public Health, 2013.

Figure 2: The Connswater Community Greenway

Figure 3: Number of new chronic diseases prevented over 40 years, if 2%, 5% or 10% of those currently inactive in the Greenway population, become active
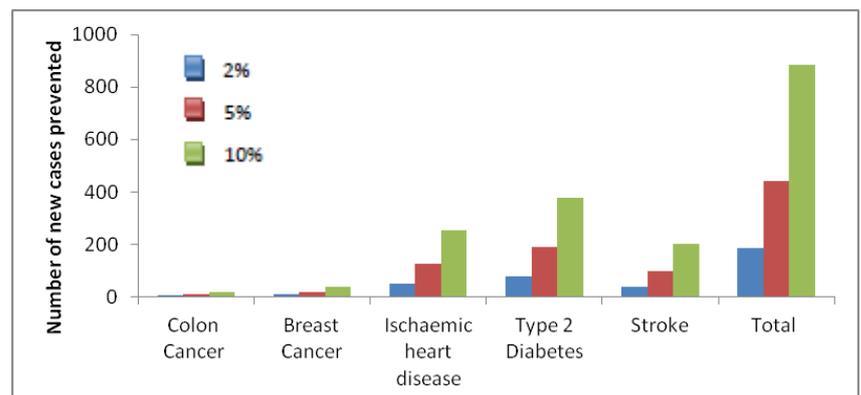
The Physical Activity Loyalty Card Scheme:
Financial Incentives to Encourage Physical Activity

What we aimed to do:
We have developed a novel "physical activity loyalty card" which works in the same way as well-known high-street loyalty cards. We have applied this concept in public health whereby participants can earn points for minutes of physical activity which can be reimbursed for rewards, for example, retail vouchers. We aimed to pilot test whether it would be feasible to roll the Physical Activity Loyalty Scheme out along the Connswater Community Greenway once it is completed in order to encourage people to be more active.

Figure 4: The Physical Activity Loyalty Card Scheme

What we did:
Our scheme used sensors placed along footpaths and in gyms (Figure 4). When users went for a walk, they swiped their loyalty card across the sensors. This collected information on the time that the card was scanned, and was sent to our study website and processed. Participants logged onto their private user account to get feedback on the amount of activity that they undertook. Participants "earned" 1 point for each minute of activity that they completed and collected points could be redeemed for rewards which were retail vouchers (e.g. free cinema pass, free sandwich voucher) sponsored by local businesses.

We recruited 406 civil servants based at Stormont Estate to take part in the 12-week study. Participants were selected at random to be in one of two groups; 1) the *Incentive Group* where they used their loyalty card to monitor their activity levels and earned points and rewards for the minutes of activity that they completed; or 2) the *No Incentive Group* where they used the card to monitor their activity levels but did not earn points or collect rewards. This allowed us to test how effective the rewards were in encouraging physical activity. We examined whether the intervention resulted in increased physical activity levels at the end of the 12-week intervention and if this effect was maintained 3 months after the scheme ended.
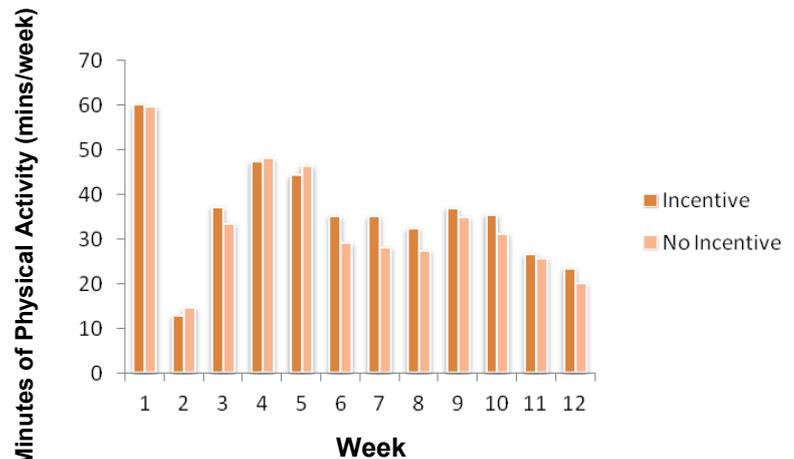

Figure 5: Minutes of physical activity over the 12 week study

What we found:
This study showed us that: 1) the technology worked; 2) people were very interested to take part; 3) the intervention has the potential to increase physical activity (Figure 5); 4) local businesses will sponsor the rewards which creates a sustainable business model. The study demonstrated a high uptake and participation rate, particularly among those who were inactive.

Why this is important:
This study has important implications for public health and the development of future strategies for promoting physical activity. The next stage is to do a much larger study which will involve rolling the Physical Activity Loyalty Card Scheme out to approximately 10,000 people who live in the nearby vicinity of the Connswater Community Greenway.

Citation: **Ruth F. Hunter, Mark A. Tully. Michael Davis, Michael Stevenson, Frank Kee. Physical activity loyalty cards for behaviour change: A quasi-experimental study. American Journal of Preventive Medicine 2013; 45(1): 56-63.**

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The Effectiveness of Physical Activity Interventions in Socio-economically Disadvantaged Communities: A Systematic Review

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To reduce inequalities, effective interventions to increase levels of physical activity in socio-economically disadvantaged communities are needed. We conducted a systematic review of the literature to examine the effectiveness of interventions designed to increase physical activity in these communities.
Studies were categorised according to whether interventions targeted individuals (n=4), groups (n=18) or communities (n=5).

We found:
- group-based interventions were effective for adults but not for children;
- insufficient evidence to support individual-based interventions;
- limited evidence to support community-based interventions;
- education and social support were effective intervention components.

These findings highlight possible effective approaches to reducing health inequalities in physical activity and help design effective interventions for the Greenway.

Citation: Claire L. Cleland, Mark A. Tully, Frank Kee, Margaret E. Cupples. The effectiveness of physical activity interventions in socio-economically disadvantaged communities: A systematic review. Preventive Medicine 2012; 54(6): 371-380.

A New Walkability Tool

Figure 6: The Real Walk-able Network

Established walkability indices tend to use road centre lines as a proxy measure for connectivity as these are routinely recorded by statutory agencies. However, this is not capable of measuring park based interventions, such as the CCG. Therefore, the actual footpath network of the study area was mapped, differentiating this into 7 different path types. This produced a Real Walkable Network that can measure very detailed changes to the built environment relating to walking and cycling and their impact on walkability. This facilitates the analysis of how the CCG will change the local environment, and using findings from the household survey will contribute to a greater understanding of the links between the built environment and physical activity.
This work has received a grant from ESRC Knowledge Exchange for research on 'Knowledge Exchange, Spatial Analysis and Healthy Urban Environments: Integrating Walkability Models into Practice'. Working with a range of partners from statutory and non-statutory agencies, we have extended the mapping of the Real Walkable Network to Belfast and Derry City Council areas, aiding the translation of research into practical, policy-based tools.

For more info visit: **www.qub.ac.uk/research-centres/KnowledgeExchangeSpatialAnalysisandHealthyUrbanEnvironments**

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