

GoWell is a collaborative partnership between the Glasgow Centre for Population Health, the University of Glasgow and the MRC/CSO Social and Public Health Sciences Unit, sponsored by Glasgow Housing Association, the Scottish Government, NHS Health Scotland and NHS Greater Glasgow and Clyde.

A large, stylized graphic of a human figure. The head is a teal circle containing the title. The torso is a grey silhouette. The bottom part of the figure is a teal shape that tapers to the left.

Putting a spring
in Glasgow's step:
neighbourhood
walking in
deprived areas

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GoWell is a planned ten-year research and learning programme that aims to investigate the impact of investment in housing, regeneration and neighbourhood renewal on the health and wellbeing of individuals, families and communities. It commenced in February 2006 and has a number of different research components. This paper is part of a series of Briefing Papers which the GoWell team has developed in order to summarise key findings and policy and practice recommendations from the research. Further information on the GoWell Programme and the full series of Briefing Papers is available from the GoWell website at: www.gowellonline.com



INTRODUCTION

The link between being physically active and being physically and mentally healthy is widely accepted. The relatively poor health of the people of Glasgow is well known¹. The city's residents are less likely to meet the recommendation of the Scottish Government's Physical Activity Task Force² – to accumulate at least 30 minutes of moderate physical activity on most days of the week – than people elsewhere in Scotland and the rest of the UK¹. To make matters worse, people living in the very deprived areas of Scotland, which include many Glasgow neighbourhoods, have even lower levels of physical activity than those in less deprived areas³.

Glasgow is receiving substantial investment in regeneration to improve and transform disadvantaged homes, neighbourhoods and communities. These better environments may be conducive to people living healthier lives, so regeneration offers an opportunity for personal as well as broader forms of urban renewal. Better health also has knock-on benefits for the neighbourhood and wider society through the increases in economic and social capital that it engenders.

However, to be able to design and provide such places we need to know what aspects of their environments and circumstances are associated with doing physical activity for people in Glasgow's communities.

This briefing paper examines some of the elements of people's lives and their opinions about their homes and neighbourhoods that might explain the wide range of levels of physical activity we find.

We have looked in detail at the rates of walking around the neighbourhood, since this is a form of physical activity that, except for people with mobility problems or certain disabilities, almost everyone can do: it requires no special equipment or technical skill, it is free, and can be incorporated into daily routines, even by those people who do not walk simply for leisure⁴. In Scotland, 39% of men and 32% of women walked for a minimum of ten minutes at least once in the last four weeks³. Practical interventions can provide environments that stimulate walking⁵⁻⁷. Incorporating elements that are conducive to walking may therefore substantially contribute towards achieving the Physical Activity Task Force's target for 50% of adults to do the recommended level of weekly physical activity by 2022². To this end, we set out to determine what sort of regeneration interventions might put a spring in the step of the residents of Glasgow's more deprived neighbourhoods.



LEVELS OF NEIGHBOURHOOD WALKING

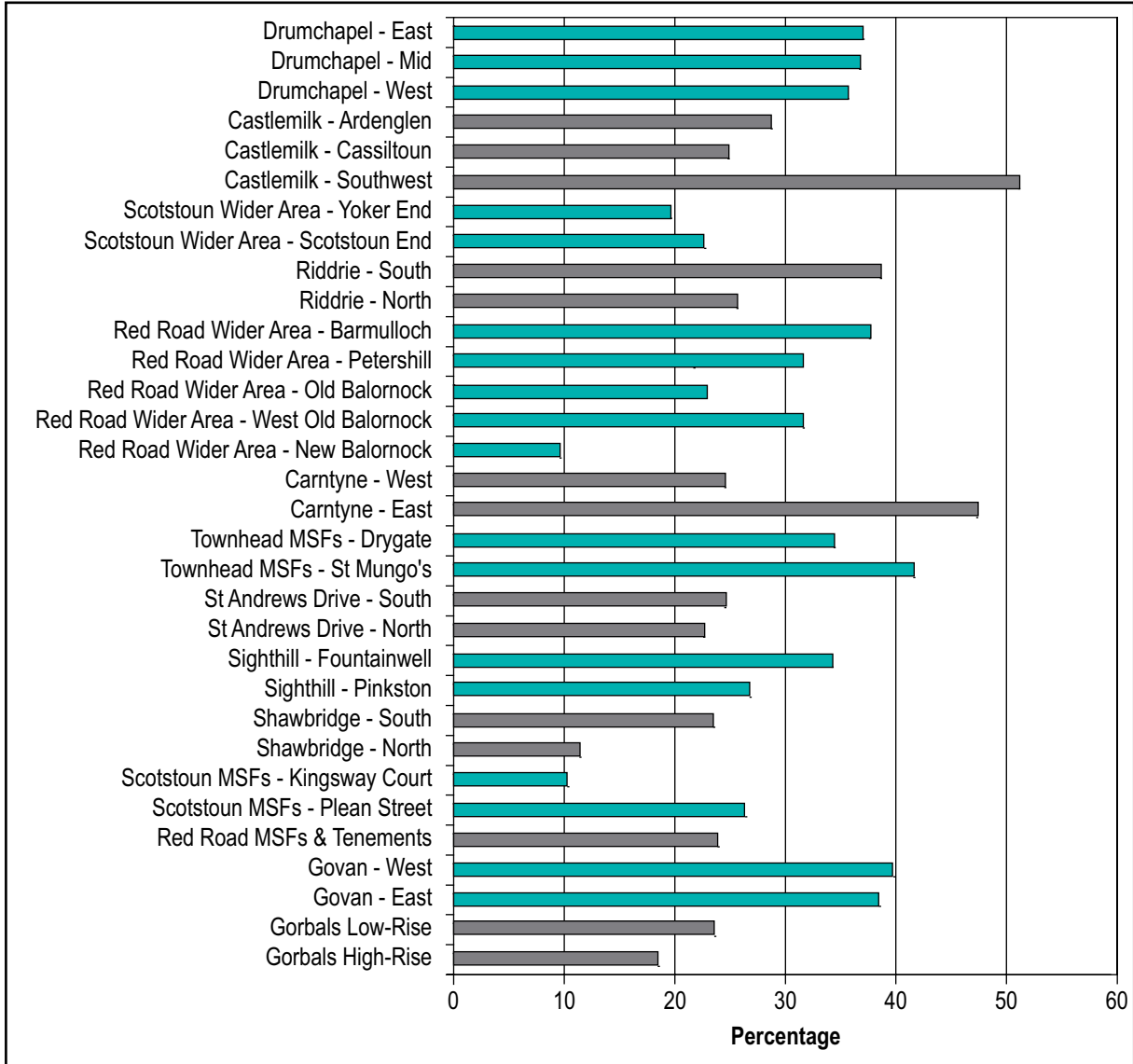
In 2006, GoWell surveyed around 6,000 adult householders in 14 relatively deprived areas of the city (comprised of 32 smaller areas or neighbourhoods) to find out what they thought about their homes, neighbourhoods and communities, and about their health and lifestyles, including the amount and type of physical activity they did.

Specifically, we asked respondents '*In a typical week, on how many days do you go for a walk around the neighbourhood?*' Walking in this context could have been for leisure or necessity (e.g. shopping, school collection). The neighbourhood was taken to be the local area within a five- to ten-minute walk of home. We divided respondents into two groups: those who said they walked in the neighbourhood for five or more days per week (referred to as "frequent walking" hereon) and those who claimed to walk less frequently.

Overall, 28.8% of respondents said they frequently walked around their neighbourhood on five or more days per week, in keeping with the generally low levels of physical activity previously reported by the residents of such areas.

However, the figures varied greatly across the 32 GoWell neighbourhoods, from 9.6% to 51.1% (Figure 1). There is no obvious pattern to this variation on a neighbourhood-by-neighbourhood basis, although residents of peripheral estates were more likely to walk frequently (34.9% of respondents living in those places) than those of inner-city mass housing estates (25.9%) and inner suburbs (28.3%).

Figure 1: Percentage of people interviewed in the GoWell neighbourhoods who claimed to walk around their local neighbourhood on at least five days in a typical week



To try and account for these varied levels of frequent neighbourhood walking, we developed a statistical model that simultaneously considered a large number of characteristics that might influence physical activity. We grouped these in terms of six types of capital: human (grouped into sociodemographic, health and amenity use components), fixed (i.e. the presence, quality, accessibility and affordability of an area's infrastructure, services, and commercial and public buildings), economic, residential, environmental, and social and community. At one time or another, most of these items have been linked with physical activity in various studies, but not all of them prove to be significant in every case, so we considered our Glasgow neighbourhoods as a unique set of people and environments. In fact, there are many

gaps in our knowledge of the determinants of physical activity specifically in deprived areas, and our study offers an opportunity to address this.

Here we consider not only those characteristics that our model indicated as being important, but those which, sometimes surprisingly, turned out *not* to be associated with frequent neighbourhood walking.

What we did

We used the information from the random, stratified sample of 5,657 adults, aged 18 or over, who answered all the relevant questions in the Wave 1 GoWell Community Health and Wellbeing Survey⁸.

We developed a multivariate logistic regression model with dichotomous dependent variable: walking around their neighbourhood on at least five days in a typical week vs. walking less. To account for any similar responses within neighbourhoods (clustering) and for contextual neighbourhood effects at the same time as examining the individual-level characteristics, our model had two levels, with respondents nested within neighbourhoods. Beginning with a model containing all the independent variables, the final multilevel model was reached by successive backwards elimination of the least statistically significant term in the current model until most of the remaining terms were significant ($p > 0.05$); the exception were a few sociodemographic variables that are customarily included in this type of analysis, but which were not themselves significant.

Results of the model are presented in Table 1 as odds ratios (or change of odds) for the variables that were significant in the final model. The raw percentages of respondents frequently walking are shown for each class of categorical variable.

WHAT IS (AND IS NOT) ASSOCIATED WITH NEIGHBOURHOOD WALKING?

Table 1 shows the percentage of people who walked in their neighbourhood on five or more days per week for each class of the categorical variables. It also presents the main results of our model, in the form of the odds ratios (or changes in the odds) for the significant associations of variables with walking around the neighbourhood on at least five days in a typical week.

The odds ratios tell us how much more or less likely it is that a person in a comparison group (e.g. someone living in a private sector house) will frequently go walking in their neighbourhood than one in a reference group (e.g. someone in a social-rented dwelling). Values greater than 1 therefore imply walking is more likely among the comparison

group; values less than 1 mean walking is less likely than in the reference group.

The change in odds tells us how much more or less likely someone is likely to do frequent neighbourhood walking for a 10 point increase in a scaled measure (e.g. the percentage of social renters in the neighbourhood, or the SF-12®* physical and mental health scores, which can have values between 0 and 100).

Table 1. Items significantly associated with walking around the neighbourhood on five or more days in a typical week.

Odds ratio (comparison: reference groups) or change in odds					
Percentage in comparison category frequently walking around their neighbourhood			Odds ratio		
Comparison category			Reference category		
Variable	Percentage in reference category frequently walking around their neighbourhood	Reference category	Comparison category	Percentage in comparison category frequently walking around their neighbourhood	Odds ratio
Human capital: sociodemographic					
Age	18-24 years	41.0	25-64 years ¹	30.8	0.845
			≥ 65 years	19.6	0.604
Ethnicity/citizenship	White British	28.7	Non-white or unknown ethnicity British/non-British	35.4	1.540
			Asylum seeker / Refugee	27.5	1.505
Human capital: health and health behaviours					
Long-term illness or limiting condition	No	30.3	Yes	10.5	0.562
Respiratory problem	No	30.5	Yes	17.1	0.757
Physical health scale (SF-12)					1.207 ²
Mental health scale (SF-12)					1.219 ²
Drinks alcohol	No	24.4	Yes	36.6	1.373
Fast food consumption	<2 days/week	25.9	2-7 days/week	40.8	1.761
Human capital: amenity use					
Parks or play areas	No	17.2	Yes	34.6	2.046
General shops	No	13.9	Yes	29.5	1.704
Social venues	No	21.1	Yes	35.1	1.280
Fixed capital					
Built form: percentage of homes in multi-storey flats in neighbourhood					0.886 ²

* 12-item short-form health survey – see www.sf-36.org for more information.

Odds ratio (comparison: reference groups) or change in odds					
Percentage in comparison category frequently walking around their neighbourhood					
Reference category			Comparison category		
Variable	Percentage in reference category frequently walking around their neighbourhood		Percentage in comparison category frequently walking around their neighbourhood		Odds ratio
Residential capital					
Tenure of respondent	Social rented		Private sector		1.370
Tenure: percentage of social-rented housing in neighbourhood					1.149 ²
Sense of progress from living in neighbourhood	No	30.3	Yes	26.9	0.739
Percentage of respondents satisfied with their neighbourhood					1.495 ²
Environmental capital					
Quality of parks and open spaces: respondent rating	Poor or neutral	26.6	Good	31.5	1.169
Percentage of respondents rating quality of parks and open spaces as good					0.556 ²
Social and community capital					
Respondent feels safe walking alone in neighbourhood after dark	No	22.1	Yes	32.6	1.200
Percentage of respondents who feel safe walking alone in their neighbourhood after dark					0.686 ²
Feeling of belonging to neighbourhood	No	25.9	Yes	37.5	1.694
Informal social control: harassment by youths would be challenged	No	27.5	Yes	30.0	1.220
Honesty: lost purse would be returned intact	No	30.9	Yes	24.1	0.629
Harmony: people from different backgrounds get on well together	No	21.4	Yes / don't know / everyone from same background	30.1	1.376
Participation in club/organisation in past year	No / don't know	29.1	Yes	21.6	0.537

1. Comparison and reference categories not significantly different.

2. The change in odds of frequently walking around the neighbourhood is that associated with a 10% increase in the value of the scaled (continuous) variable.

Human capital – sociodemographic characteristics

Men and women were equally likely to do frequent walking, but there was a marked decline in this activity with age: in particular, people older than 65 years were 0.6 times as likely to walk frequently as those aged between 18 and 24 years. There was no great difference in the likelihood of walking frequently in the neighbourhood according to the type of household someone lived in or their level of educational qualifications. Respondents from non-white and non-British ethnicity and citizenship groups were about 1.5 times as likely to do frequent walking as White British respondents.

Human capital – physical and mental health

Not surprisingly, measures of physical health were generally among the characteristics most strongly associated with frequent neighbourhood walking. People, who reported a long-term illness or limiting condition, and more specifically, a respiratory condition, were respectively 0.56 and 0.76 times as likely to do frequent walking as their healthier counterparts. Consistent with these specific physical health problems, respondents with better overall physical health (represented by the SF-12 Physical Component Score) were significantly more likely to walk frequently around their neighbourhood. Even so, some specific health conditions, such as having a musculoskeletal or cardiovascular illness, or a condition that restricted physical activity did not appear to affect a person's likelihood of walking frequently: people with these conditions were just as likely to walk as those with better physical health.

The better people's mental health was, as measured by the SF-12 Mental Component Score, the more likely they were to do frequent neighbourhood walking. Other studies have shown similar links between mental health and physical activity⁹⁻¹⁰. However, when we asked people directly about their experience of mental health problems – whether they considered themselves to have been anxious, depressed or stressed, and if they had had contact with a GP concerning a psychological problem, both in the previous 12 months – there was no clear association with walking.

Human capital – health behaviours

Positive and negative health behaviours had a mixed relationship with frequent walking. Smokers and non-smokers were equally likely to walk frequently, but people who drank alcohol (irrespective of the amount) were 1.37 times as likely to do walking around their neighbourhood frequently as those who abstained. The latter association between a positive health behaviour (walking) and a negative one (drinking) has been noted in other studies¹¹. Similarly, those whose main meal came from a fast-food outlet more than once a week were 1.76 times as likely to walk frequently as those who used these outlets less frequently. These patterns were seen across all age groups, and were not due to younger, more active people being the most likely to drink and eat fast food.

Human capital – use of amenities

We asked people whether they used a range of ten amenities. Mostly, people used amenities in their own neighbourhood, but we also considered amenity use beyond the neighbourhood. Use of two of these amenities provided two of the four biggest associations with frequent neighbourhood walking identified in our model:

- those who used parks and play areas were twice as likely to walk frequently as those who did not;
- those who used general (non-food) shops were 1.70 times as likely to walk frequently as those who did not;
- slightly less strikingly, those who used social venues were 1.28 times as likely as non-users to do frequent neighbourhood walking.

On the other hand, use of sports facilities, post offices, small grocers, supermarkets, libraries, community centres or job centres was not associated with any greater probability of taking frequent neighbourhood walks than if they were not used.

Other studies have found the presence of various amenities to be associated with walking^{12,13}, but we identified a different set of them (to which we could add fast-food outlets as amenities) as being linked with our measure of frequent neighbourhood walking.

Economic capital

Two aspects of economic capital – employment status (working, not working, or retired) and whether a respondent had regular access to a vehicle (a proxy indicator of income deprivation often used in studies of this kind) – did not appear to be related to the probability of walking frequently. Given that the populations in our deprived neighbourhoods are distributed towards the lower end of the socio-economic spectrum, it is unsurprising that we were unable to discriminate neighbourhood walking frequency with respect to this, although positive associations between socio-economic status and levels of physical activity, particularly for leisure, are well established¹⁴.

Fixed capital

People who lived in low-rise flats or houses were respectively 1.26 and 1.32 times as likely to walk around their neighbourhood frequently as those living in multi-storey flats, although this relationship was not significant in our model, and is shown in Table 1. Conversely, if we consider not just the type of building each respondent lives in, but all the types of residential building in the neighbourhood, the likelihood of an individual doing frequent walking dropped significantly by a factor of 0.89 for a 10% increase in the number of multi-storey flats amongst all the dwellings in their neighbourhood. Surprisingly, the effects of residential built form of neighbourhoods have received little attention from researchers¹⁵, but our findings suggest that there is a genuine association, over and above what can be ascribed to poverty and deprivation.

Residential capital

Residents in owner-occupied or private-rented accommodation were 1.37 times as likely to report frequent neighbourhood walking as those in social-rented dwellings.

Residents' levels of satisfaction with their home and their neighbourhood were not associated with any differences in the probability of doing frequent neighbourhood walking. On the other hand, people were more likely to walk frequently as the general level of satisfaction of all residents in the neighbourhood rose: for every 10-point increase in general neighbourhood satisfaction the likelihood of an individual walking around their neighbourhood on five or more days of the week rose by about 50%.

As measures of the psychosocial benefits of the home and of the neighbourhood, the degree to which respondents' felt that their home or neighbourhood made them feel they were doing well in life was not associated with the propensity for frequent walking. However, people who considered that their neighbourhood made them feel they were doing well in life were only 0.74 times as likely to walk frequently as those who had a negative or neutral view on this matter. This result is difficult to interpret, though it is worth noting that sense of neighbourhood progress increases with age, whilst, as we have seen, walking declines with age.

The relationship between the reputation of neighbourhoods and walking behaviour was not straightforward. Frequent walking was not connected with residents' views about whether other people living in their neighbourhood thought highly of it (internal reputation). However, positive judgements of the neighbourhood's external reputation (i.e. residents believing that people elsewhere in Glasgow do not think negatively about their area) were associated with 1.36 times the likelihood of walking frequently compared with those who had a negative or neutral opinion about the area's external reputation. These findings may reflect a situation where, for a negative reputation, the internal view (of one's neighbours) matters the most, or has the most negative effect, whereas for a positive reputation, the perceived view of outsiders matters most to residents.

Environmental capital

Good neighbourhood aesthetics have often been linked to enhanced walking activity^{16,17}. Our investigation of four aspects of the quality and appearance of neighbourhoods gave mixed results, however.

There was no link between the proportion of residents frequently walking around their neighbourhood and how attractive they considered the buildings and the local environment to be and whether they thought the area was quiet and peaceful. Only their opinion about the quality of parks and open spaces was associated with neighbourhood walking, whereby respondents who rated these areas as fairly or very good were 1.17 times as likely to do this activity as those with a neutral or negative assessment. Paradoxically, at the neighbourhood level, living in an area where a large proportion of people positively rated parks and open spaces was associated with less walking: for every 10-point increase in the number of people in the neighbourhood who regarded the parks and open spaces as being of good quality, the chances of an individual walking frequently dropped by just over half.

Social and community capital

Although the social and community aspects of people's environments are less tangible than their physical form and condition, positive views of the local social environment and a strong sense of community have often shown notable associations with physical activity and walking¹². We found broadly similar patterns, but not for all the aspects we looked at. Some of these patterns are difficult to explain.

Respondents' strength of feeling that they belonged to their neighbourhood and that they were safe walking alone in the neighbourhood after dark were two characteristics most strikingly associated with higher odds (1.69 and 1.20, respectively) of walking frequently in our study. Paradoxically, though, at the neighbourhood level, for every 10-point increase in the percentages of people feeling safe walking at night the likelihood of an individual frequently walking around their neighbourhood dropped by a factor of 0.69. This is another finding that we cannot easily explain.

More positive perceptions of informal social control and harmony were also significantly associated with a greater probability of frequent walking: 1.22 and 1.38 times as likely, respectively), but the extent of available social support was not. Conversely, there was a significant negative association between perception of honesty and walking (odds of 0.63). Participation in groups or organisations (not necessarily in the local area) was significantly associated with much lower odds (0.54) of frequent walking. Frequency of contact with neighbours was not associated with neighbourhood walking.

Further information from our model

Responses to our questions were likely to be more similar within than between neighbourhoods, suggesting that walking frequency is affected by very specific and

local aspects of the people who live there and the environment they encounter. Our analysis was able to explain around 17% of the variation in walking among neighbourhoods, meaning there is much left unexplained.



STRENGTHS AND LIMITATIONS OF OUR STUDY

We made use of data from a large sample of participants to try and identify the personal, residential, neighbourhood and community correlates of walking behaviour specifically of people from deprived communities. The large number of participants in our survey provided the statistical power we needed to be able to identify significant relationships with frequent neighbourhood walking in a complex analysis that simultaneously considers many factors. The multilevel approach we adopted, in which we examine not only individual-level characteristics (respondents' circumstances and opinions) but also neighbourhood-level effects (measures of the combined circumstances and opinions of all respondents in the same neighbourhood) associated with walking, is a powerful but not universally used method in this type of research.

However, there are some limitations to our study. We asked our respondents about the number of days in a typical week they walked around the neighbourhood, but not the *duration* of these events, so we cannot tell exactly how much this type of walking contributes to people's total levels of physical activity. Neither do we know *why* people walked around their neighbourhood – was it for leisure or for practical purposes? This distinction is important because the different reasons may have different environmental determinants¹⁸. Future analyses, based on more detailed information obtained at future survey waves, will address these matters.

Throughout this briefing paper we refer to *associations* between the variables and frequent neighbourhood walking: because the data considered here are cross-sectional, providing a single snapshot rather than a moving picture of our communities, we cannot say for certain that any of the characteristics *affects* the rates of neighbourhood walking directly or indirectly. Subsequent waves of GoWell will provide us with repeat cross-sectional and longitudinal data. By including these data in future analyses we will be able to measure changes in walking behaviour and physical activity and be able to relate them *causally* with greater certainty to changes in the built environment arising from regeneration.



WHAT IMPLICATIONS DO OUR FINDINGS HAVE FOR AREA REGENERATION?

The low levels of physical activity achieved by the residents of Glasgow's deprived communities is a cause for great concern, given the positive contribution that higher levels could make to improving the generally poor health of this group of people.

We have investigated the features and perceptions of the local physical and social environment associated with the frequency of neighbourhood walking, contextualising them within a framework of six capitals, all of which we would expect to be enhanced by successful regeneration. Our findings highlight items that could be manipulated to foster conditions under which people engage in frequent, regular local walking, or to ameliorate the conditions that discourage it. We can also identify regeneration activities that seem less likely to influence walking.

Community Diversity (Ethnicity and Tenure). Our findings on human capital elements are relevant to regeneration programmes that seek to alter the social composition of communities and to support social capital development among residents. The fact that younger adults and non-British residents were more likely to walk is important since these groups are relatively numerous in deprived areas¹⁹ and are the least well integrated^{20,21}. Similarly, individuals who live in private sector housing, whom regeneration aims to attract to deprived areas, also tend to walk more. Hence, a stronger emphasis on social regeneration and the integration of marginalised and incomer groups *could* influence walking behaviour of the majority of adult residents through peer effects from more active neighbours, similar to those peer effects seen with obesity²². In addition, walking programmes that bring walkers and non-walkers together may further aid the operation of these effects.

Physical Restructuring. Physical aspects of housing-led regeneration remain potentially important, although their relationship with walking behaviour is not straightforward. Living in an area with a low proportion of multi-storey flats was associated with a greater probability of walking frequently around the neighbourhood. This is particularly relevant to Glasgow at this time, since a number of its high-rise estates from the 1960s and 1970s have been, or may be, demolished. Their replacement by new residential areas of houses and low-rise flats may in itself encourage walking, but, additionally, such large-scale restructuring offers the opportunity to include elements of a more walkable environment.

Local Amenities and Opportunities. Nevertheless, the effects of wider neighbourhood and community regeneration on rates of physical activity may be more important than those of housing-led regeneration. Regeneration strategies could seek to increase the number of people using local amenities, since we found that this is associated with higher proportions of people walking around their neighbourhood. This might involve action concerning the amount, variety, quality and accessibility (including the affordability) of local amenities. Furthermore, at the time of

writing (April 2011), GHA are piloting two walking programmes. One of these, *Going Walkabout*, will involve men aged 25-59 years who currently do little or no exercise, and aims not only to boost their levels of physical activity, but also to make them more aware of local facilities and increase their confidence in using local services (e.g. swimming pools etc.).

Parks and Play Areas. Programmes to improve (or provide for the first time) parks and children's play areas may be an important means of stimulating local walking activity. Indeed, GHA and Glasgow City Council have been jointly running a play area improvement programme in a number of communities across the city since 2005.

Area Reputation. Taking at face value our finding about poor external reputation making it less likely that someone walks regularly, we can highlight the possibility that neighbourhood and community regeneration may need to extend beyond physical regeneration activities within the immediate geographic boundaries of the target area in order to improve external reputations. This might enable residents to feel better about their own area and to use it more, in this case, for walking. Reputational renewal may therefore warrant consideration as part of regeneration. This is an area in which GHA and its partners are actively engaged.

Social Regeneration. The final element is social regeneration. We found strong associations between walking and positive perceptions of the community, including having a strong sense of belonging, feeling safe, considering the community to be harmonious, and feeling able to rely upon the control exercised by others, and a strong negative effect from not trusting in the honesty of one's neighbours. Thus, interventions to improve neighbourhood safety (such as better lighting and area supervision), and to boost people's sense of cohesion, community and local attachment might contribute to physical activity through walking, and to additional social goals.

Multidimensional regeneration of the physical, service, social and psychosocial environments of Glasgow's deprived communities therefore seems to be an appropriate strategy for boosting physical activity (walking, in particular), and thereby other human, residential, social and community capitals, through enhanced levels of local walking by resident groups.



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