The links between regeneration and health:
a synthesis of GoWell research findings

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GoWell

1 Introduction

GoWell is a complex, multi-faceted programme that seeks to examine the processes and impacts of neighbourhood regeneration across a range of outcomes and using a variety of research methods.
(See Box 1 for aims and objectives)

The programme commenced in 2006, and since then the team has completed and reported on:

- **Community surveys:** our study communities (15 in total) have been surveyed three times so far, in 2006, 2008 and 2011. The community survey enables us to record how communities change in composition and character as interventions progress, and also to monitor residents' opinions, feelings and behaviours. The survey includes a longitudinal study of the occupants of existing dwellings within the communities as well as a survey of occupants of new build properties. Table 1 outlines the survey sampling strategies, achieved sample sizes and response rates.

Table 1. Sampling strategy, achieved samples and response rates for the GoWell cross-sectional surveys.

Year and survey wave	Sampling	Sample size	Response rate (%)
2006 - Wave 1	All areas: random property selection	6,016	50.3
2008 - Wave 2	Regeneration areas: all properties Other areas: random selection	4,657	47.5
2011 - Wave 3	Regeneration areas: all pre-existing properties, plus all new builds Other areas: return to all previous interview addresses, plus all new builds	4,063	45.4

- **Outmovers surveys:** in order to assess the effects of relocation, we have been tracking people who have moved out of the regeneration areas in our study after 2006.

- **Qualitative research:** often our survey work raises issues that require further in-depth research in order to develop better understanding or explanations. In order to pursue these issues, we also conduct qualitative research with residents and practitioners involved in the interventions or living in the study areas. Using qualitative research methods we have gained insights

into a range of issues including: the experiences of particular subgroups (e.g. asylum seekers and refugees); the 'lived realities' of residents in transformational regeneration areas; resident and practitioner perspectives on mixed tenure neighbourhoods; clearance processes; the experiences of young people living through regeneration; and governance, empowerment and participation processes in our study areas.

- **Ecological analysis:** as well as studying a particular set of communities, we also examine changes across the city as a whole. Our ecological analysis

allows us to consider whether our study areas improve or deteriorate over time compared with trends for other parts of the city, particularly in terms of health and deprivation indicators.

- **Studies focused on specific issues, core to GoWell objectives:** these include evaluations of interventions (e.g. youth diversionary projects, environmental employability programmes); linked data analysis on policy issues (e.g. crime, education* and financial insecurity*); and research to highlight areas for action (e.g. media coverage of regeneration areas).

Box 1. GoWell aims and research objectives.

Aims:
• To investigate the health and wellbeing impacts of regeneration activity associated with the Glasgow investment programme.
• To understand the processes of change and implementation which contribute to (positive and negative) health impacts.
• To contribute to community awareness and understanding of health issues and enable community members to take part in the programme.
• To share best practice and knowledge of 'what works' with regeneration practitioners across Scotland on an ongoing basis.

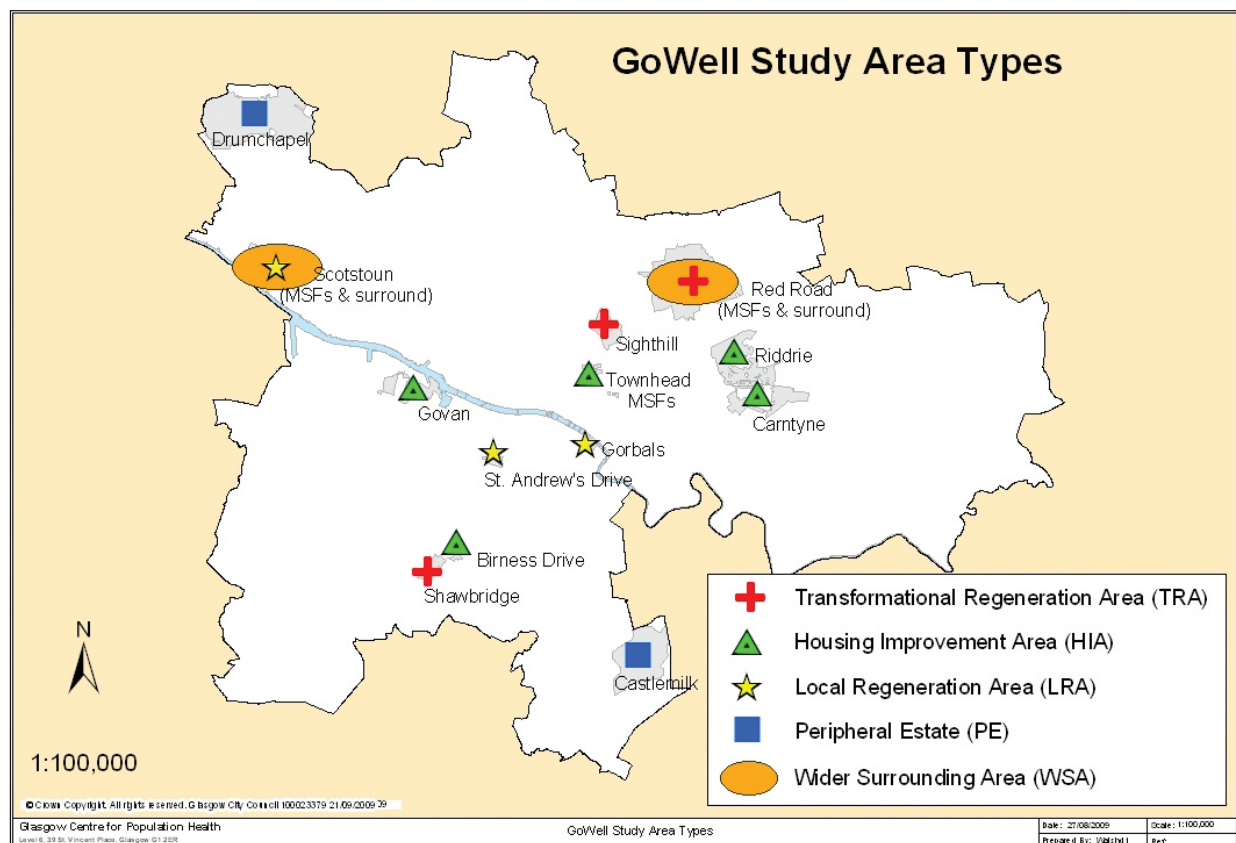| Research objectives: |
| --- |
| • To investigate how neighbourhood regeneration and housing investment affects individuals' health and wellbeing. |
| • To assess the degree to which places are transformed across a range of dimensions through processes of regeneration and housing improvement. |
| • To understand the processes that support the maintenance or development of cohesive and sustainable communities. |
| • To monitor the effects of regeneration policy on area-based health and social inequalities across Glasgow. |
| • To develop and test research methods appropriate to the investigation of complex, area-based social policy interventions. |

* Current studies - not yet reported.

There are 15 GoWell communities, grouped into five 'intervention area types'. Most of our analysis takes place at the level of an area type (see Box 2 for description of the five intervention area types), but sometimes we will focus on a particular area or on Glasgow as a whole (see Figure 1 for a map of the 15 study areas). Our job is primarily to understand the patterns and trends that emerge as the regeneration processes are implemented in different parts of the city, rather than to study any particular area in detail.

Box 2. GoWell intervention area types.

Intervention area type (IAT)	Description	Study areas
Transformational Regeneration Areas (TRAs)	Places where major investment is underway, involving a substantial amount of demolition and rebuilding over a long period. Many residents who remained in these neighbourhoods during the study period were waiting to relocate while nearby properties were cleared for demolition.	Red Road, Shawbridge, Sighthill.
Local Regeneration Areas (LRAs)	Places where a more limited amount and range of restructuring is taking place, and on a much smaller scale than in TRAs.	Gorbals Riverside, Scotstoun, St Andrews Drive.
Wider Surrounding Areas (WSAs)	Places of mixed housing types surrounding areas of multi-storey flats subject to transformation plans, and being used for decanting purposes from the core investment sites. These areas also receive substantial amounts of core housing stock investment.	Wider Red Road, Wider Scotstoun.
Housing Improvement Areas (HIAs)	Places which are considered to be popular and functioning successfully, but where significant improvements are required to dwellings, both internally and externally. Extensive property improvement works take place in these areas.	Birness Drive, Carntyne, Govan, Riddrie, Townhead.
Peripheral Estates (PEs)	Large-scale housing estates on the city boundary where incremental changes are taking place, particularly in terms of housing. These estates were originally entirely social rented but, as a result of the Right-To-Buy scheme and private developments in recent years, there is now a significant element of owner-occupied as well as rented housing. Private housing development and housing association core stock improvement works both take place on these estates.	Castlemilk, Drumchapel.

Figure 1. Map of the GoWell study areas.

GoWell Study Area Types

- Drumchapel
- Scotstoun (MSFs & surround)
- Red Road (MSFs & surround)
- Sighthill
- Riddrie
- Townhead MSFs
- Govan
- Carntyne
- St. Andrew's Drive
- Gorbals
- Birness Drive
- Shawbridge
- Castlemilk

N

1:100,000

Legend:
- ✚ Transformational Regeneration Area (TRA)
- ▲ Housing Improvement Area (HIA)
- ★ Local Regeneration Area (LRA)
- ■ Peripheral Estate (PE)
- ⬭ Wider Surrounding Area (WSA)

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GoWell Study Area Types

Date: 27/08/2009 Scale: 1:100,000
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One of the ways in which GoWell is distinct from many other research programmes is in its commitment to close working with its sponsor organisations, local communities, and policy, practice and research communities more generally (Box 3 outlines our learning objectives). Priority has been placed on disseminating our findings, discussing their implications with our many stakeholders, and using the research to inform organisational plans and ways of working. These processes have in turn informed our research priorities and approaches, and have helped ensure the ongoing relevance of GoWell as contexts change and new priorities arise. The key challenge is to enable the rich data emerging from our research processes to be translated into meaningful insights – and thereafter recommendations for policy and practice – through being brought together with the experience of local residents and those working to improve the circumstances of the communities. We recognise that such insights need to be built up from across the different programme components, and overtime.

Box 3. GoWell learning objectives.

Learning objectives:
- To distil learning from across the various components of GoWell, in a way that enables regeneration policy and implementation to take greater account of opportunities to improve health and wellbeing.   - To make opportunities to influence policy across Government Directorates and at a regional and local level.   - To facilitate capacity of the GoWell communities and their local structures to use learning in a way that empowers them.   - To disseminate methodological developments and research findings to academic and practitioner audiences, through a range of written and verbal communications.

The purpose of this report is to bring together findings from our analyses to date. It focuses on the findings that help to build an understanding about the relationships between neighbourhood regeneration and health and wellbeing. It draws on various components of GoWell and thereby paints a richer picture than can be seen from the separate reports and briefing papers. We hope it is a picture that will cause people to reflect and will also stimulate action.

Regeneration and health

Health and wellbeing have become important objectives for housing and regeneration policies in Scotland and the UK[1]. Within GoWell we have reflected this national priority through having done the following: reviewed the literature about regeneration and health links; considered further the routes by which regeneration might improve population health; monitored changes in physical health, health behaviours and mental health and wellbeing across our study communities and within the context of the city of Glasgow; and looked at how health is changing for individuals living through different forms of regeneration or experiencing housing improvements.

The recognition that neighbourhood regeneration needs to be multi-faceted is now well established in national policy as well as local strategies and plans. From an early analysis of policy that we undertook at the time of the GoWell baseline surveys in 2006, there was clear evidence of a policy commitment to a holistic approach to regeneration and a remarkable level of agreement (in policy terms and among interviewees comprising community residents, practitioners and people involved in regeneration strategy) about the necessary ingredients for effective regeneration[2]. The key ingredients were seen as being:

- **Housing regeneration** - quality housing, affordable housing, mixed tenures, and accessible housing support

- **Environmental regeneration** - high-quality public realm, improved amenities and buildings, and enhanced natural environments

- **Economic regeneration** - opportunities for sustained employment and good quality work, transport infrastructure providing improved access to opportunities, and business growth

- **Social regeneration** - effective community involvement, reduced crime and antisocial behaviour, learning and training opportunities, wider community participation and empowerment.

In addition, policy interviewees in this study felt that more emphasis should be placed on incorporating a 'person-centred' approach, fostering confidence, life-skills, and higher aspirations. Better health and wellbeing were regarded as likely outcomes to emerge from this holistic approach, rather than as a direct consequence of any particular intervention. This is an important point. Many factors, operating in different ways, have a cumulative effect on people's health over the life-course. It will take large-scale multi-dimensional change, sustained over time, to turn around the health statistics in communities that have experienced poor population health for many years. To date there is an absence of evidence that area-based regeneration approaches have achieved this.

That said, the research literature includes many findings demonstrating important relationships between neighbourhoods and health, and impacts of regeneration of the different types described above. Box 4 highlights some of these. In GoWell we are able to add to the evidence-base. Our programme has particular strengths in being long-term and also longitudinal; in looking at a range of different interventions

(see Box 5); and incorporating several measures of health outcome.

Box 4. Neighbourhoods and health: key messages from the literature.

- On a wide range of measures, the health of people living in poorer areas is much worse than the health of those in areas with less deprivation. This is not just about a comparison of the most affluent and most deprived communities: there is a steady health gradient between the two extremes.
- The effects on health of living in an area of deprivation are less for people of higher social status/grade (e.g. in employment or financial terms), either because they can use their individual resources to protect themselves from local stressors or because they are able to separate themselves from the worst parts of the neighbourhood.
- An area's history matters, as well as its current level of deprivation. For example, deindustrialised areas have a higher chance of being in poor health, controlling for other factors.
- Aspects of community are also important for health – including civic engagement, social engagement, and feeling part of the local community.
- Large US studies have shown significant and consistent findings that moving out of the poorest neighbourhoods results in improved mental health (using a range of measures).
- Experiences of prolonged, chronic stress have both psychological and biological consequences. It may be that one of the important health impacts of neighbourhoods is whether they provide a stressful, or stress-free, residential context.
- It matters not only *what* regeneration does, but also *how* things are done.

Box 5. Interventions being studied through GoWell.

Housing Improvements: Through the implementation of the Scottish Housing Quality Standard and the investment programme undertaken by Registered Social Landlords (RSLs) and by Glasgow Housing Association (GHA) since housing stock transfer in 2003, there is a substantial programme of housing improvement works being applied to all social housing in the city. Most of our study areas have received large numbers of housing improvements, and residents may therefore be experiencing the twin effects both of individual housing improvements, and of area-level impacts from multiple improvements which transform the appearance of a neighbourhood.

Transformational Regeneration: Three of our study areas are undergoing transformational regeneration involving almost entire redevelopment over time. Three further study areas are experiencing restructuring that is less than full redevelopment. Regeneration involves physical change through the replacement of residential and other buildings, other neighbourhood improvement works (such as to green spaces and shops), and housing and social restructuring towards mixed tenure communities. Economic development, cultural activities and wider skills development/educational processes may also form part of the intervention.

Resident Relocation: A necessary element of transformational regeneration is the relocation of residents to housing elsewhere in order to enable restructuring to occur. Some people may move more than once as a part of this process, and very few people will move back to the restructured area even if they had originally thought they might do so. Relocation has generally been considered to be a negative experience and to have detrimental impacts on people, due to loss of attachment and disruption to social connections, though as researchers we need to retain an open mind on this.

Mixed Tenure Communities: Mixed tenure communities is a central tenet of housing and regeneration policy, with an associated set of desired outcomes relating to residential satisfaction, area reputation, community pride and place attachment, and resident aspirations and behaviours. Mixed tenure is occurring in the regeneration areas within the study, but also, more incrementally, in the Peripheral Estates.

Dwelling Types: All the above interventions involve changes in dwelling types for communities and residents. Urban, planning and housing policy provide support and incentives for different types of dwelling to be provided for populations, with potentially different consequences for health and wellbeing and their determinants. We are particularly interested in the effects of living in high-rise versus lower-rise flats, and whether any differences between them are altered by housing improvement works; and in the individual and community level effects of residing in houses with gardens rather than in flats of whatever kind.

Community Engagement and Empowerment: Housing and regeneration policy-makers and practitioners regard community engagement and empowerment as core tenets of their approach to delivering services and change. Public sector organisations (individually, and collectively through community planning processes) are required to engage with relevant communities/user groups in the development and implementation of strategies and new initiatives. This is held to have benefits for the effectiveness of services and for service providers, as well as having positive impacts on communities in terms of confidence, capacity and cohesion – all seen as virtuous in themselves but also as necessary for other outcomes, for example in relation to health and wellbeing and employment. GHA, for example, has a strategic aim of 'Empowering communities to extend wellbeing and opportunities'.

Before moving on to consider GoWell findings, it is worth pausing to think in more detail about the ways in which community interventions *might* impact on health. Community health profiles are available for all areas of Scotland[3]. These incorporate many of the routinely measured and monitored aspects of communities, across a range of domains, and are useful to inform local planning and identify priorities. They also clearly illustrate both the gradient that exists across the country in terms of community health, and the clear difference between our most affluent and least affluent communities (see Figure 2).

Figure 2. Comparison of health outcomes and determinants of health in two Glasgow communities.
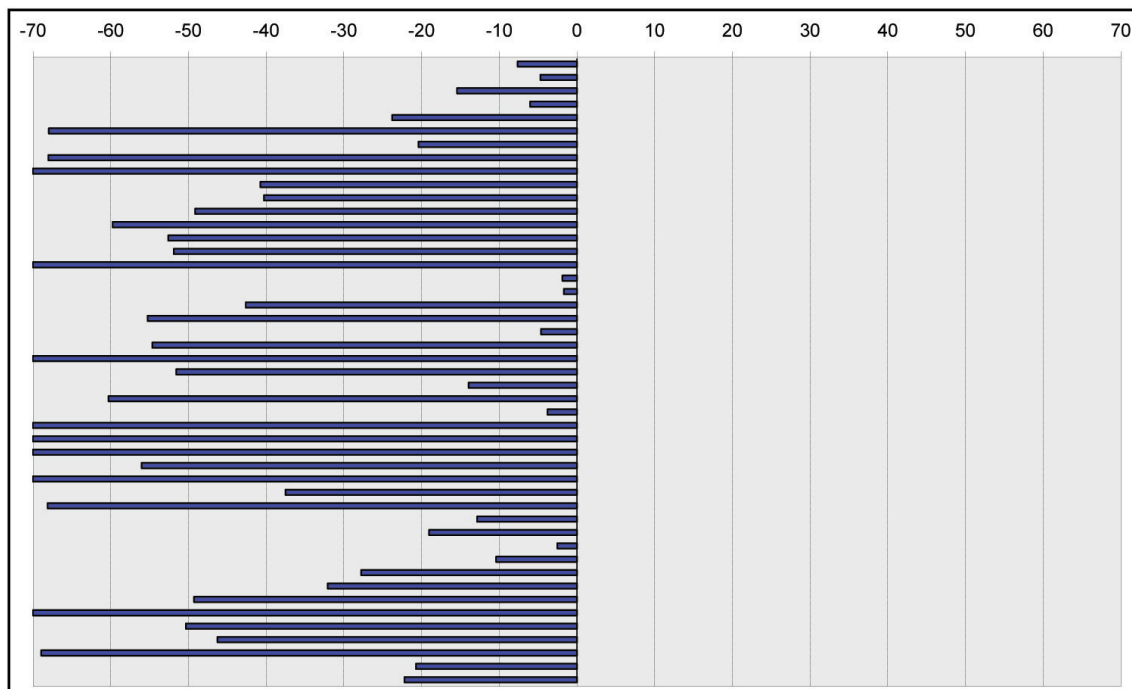
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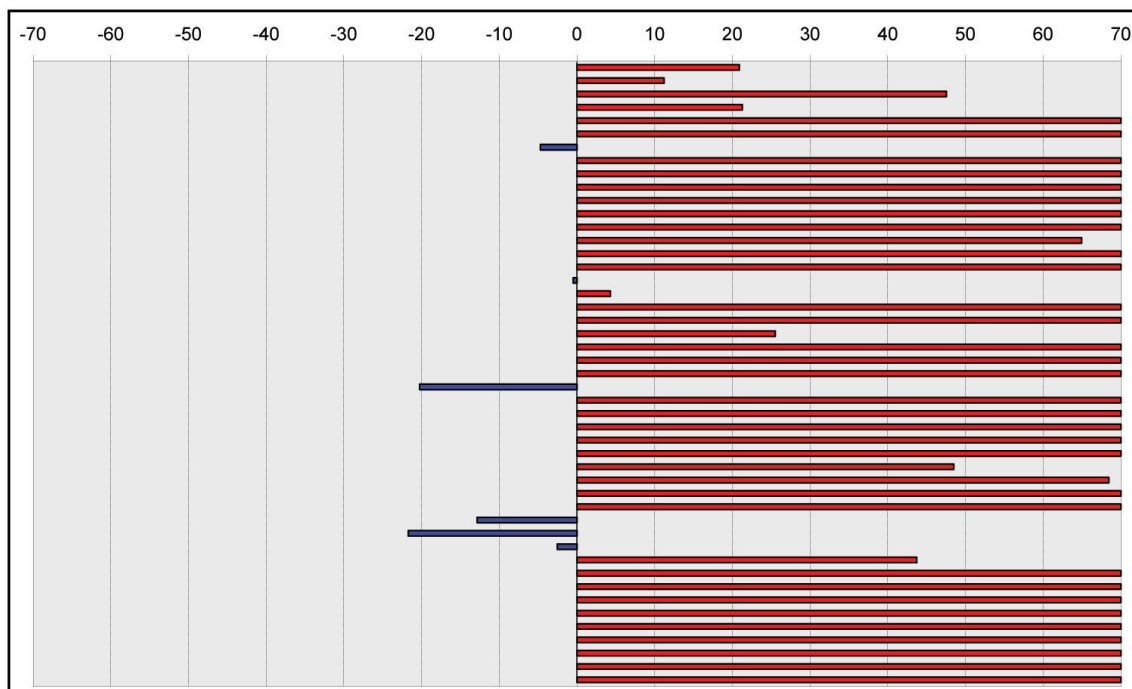
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Each bar on these charts represents that community's position on a specific indicator, with bars to the left indicating a position better than the Scottish average, and those to the right indicating a worse position. The indicators include both measures of health and measures of the determinants of health.

In the community profiles shown here, the vertical line at '0' represents the Scottish average; bars going to the left are 'better' than the average, and those going to the right are 'worse'. Using these profiles as our starting point, the relationship between area-based regeneration and health can be conceptualised in three broad ways.

1. **Action on influential factors.** Actions can be directed at the individual factors in communities (the individual 'bars' in Figure 2), for example to improve housing quality, increase the amount of greenspace, reduce worklessness, and so on. These approaches can all contribute to better population health, but none will have enough impact to make the health of the community on the right close to that of the community on the left.

2. **Action on fundamental determinants.** Alternatively, the focus can be placed on the factors that perpetuate differences in health regardless of the issue of interest. These factors cut across several of the bars, rather than sitting within any one of them. They include resources such as knowledge, power, social connections, money and language, which are protective to health no matter what risks are relevant at any time. Because of this, they are referred to as the 'fundamental determinants of health'[4]. Crucially, 'how' things are done has a big impact on several of these fundamental determinants. The distribution of power in decision-making is a prime example.

3. **Holistic approach.** Thirdly, a system-based response to Figure 2 is possible. This emphasises the need to attend as much to the relationships between the components as to the components themselves. This approach moves our thinking from a series of separate issues and the cross-cutting 'fundamental determinants' towards a multi-faceted approach where influences interact. It requires public services to work together, with the communities they serve, and with private and third sector partners, to deliver a more holistic and context-specific response to the needs of, and assets within, communities.

Our analyses of the data from the GoWell community surveys fall largely within the first of these three approaches. We are able to show associations between health outcomes and many dimensions of our study communities; we are able to show how things are changing over time; and we are able to test whether the changes are likely to have been caused by the interventions we are studying. Moving forward we will be able to use our survey data in ways more aligned to the other two approaches – but we are still at an early stage in this regard. However, as we will show, findings from the qualitative research studies provide some important insights into the other approaches.

Area deprivation and health

GoWell areas have a higher than average burden of ill health compared to Scotland as a whole[5,6]. Longitudinal research conducted by the Medical Research Council suggests that residence in low income areas of Glasgow increases the risk of future health problems (after controlling for other factors)[7]. Findings such as this underpin assumptions that deprivation is an important cause of ill health. As all the GoWell neighbourhoods meet the Scottish Government's definition of income deprived areas[5], this gives us grounds for assuming that the relatively poor health of GoWell residents can, to an extent, be explained by theories that give income deprivation a key causal role.

However, routine indicators suggest that the social patterning of health across the GoWell areas does not follow the pattern of income deprivation exactly. Some GoWell areas have a better health record than others. It cannot be assumed that those GoWell areas with the best general health are always the ones that have higher average incomes. Equally, those areas with the worst health are not consistently the most income deprived. Relationships between health and place are more complex than that and can vary depending on the health outcome in question. So, while there is a rationale for supporting interventions that aim to raise low incomes among disadvantaged groups either directly or indirectly, income deprivation is not the only driver of area-based health inequalities. For example, it is possible for areas to buck the trend for specific health problems

so that neighbourhoods with similar levels of deprivation vary in terms of their population's health (a comparison of Glasgow, Manchester and Liverpool, which have similar deprivation levels but different health outcomes, suggests that this phenomenon also occurs at a city-wide scale[8]). This provides a rationale for policy-makers and urban planners to look beyond income and scope out other social and environmental characteristics that might become the focus of regeneration. These approaches are not exclusive of one another; policy recommendations for reducing social inequalities tend to include poverty reduction and broader socioenvironmental improvements[9].

GoWell's work in scoping out social and environmental factors that link to health is multi-staged and involves a range of methodologies. What follows is a brief summary of the different approaches we have taken.

Cross-sectional analysis, as the name suggests, focuses on data from a cross-section of the population taken at a single point in time. In the case of this report, the cross-sectional data come from GoWell's community surveys and are explored using various types of quantitative analysis. Using statistical analysis, we have identified individual, home, neighbourhood and community characteristics that appear to be associated with health and wellbeing. This can help planners focus their attention on characteristics of people and place that appear to have health links and decide if there are plausible theories to suggest how modifying a particular characteristic might affect health. In addition, comparing successive cross-sectional waves (2006, 2008 and 2011) can help us measure how communities have changed since baseline. We have used the repeat cross-sectional data to compare changes over time across the five types of GoWell intervention area.

Cross-sectional comparisons also allow us to compare outcomes for communities that have experienced different types of regeneration. For example, GoWell has conducted a detailed cross-sectional analysis comparing residents who relocated from neighbourhoods undergoing transformational regeneration and demolition, with residents who remained in those Transformational Regeneration Areas (TRAs).

In contrast, tracking **longitudinal** cohorts over time helps us to move beyond evidence simply of associations between factors, to stronger evidence from which causal direction and intervention attribution may be inferred. We began a process of data linkage following the 2008 survey to identify participants who took part in both the first and second survey wave. This was a major undertaking (one which is currently being repeated for the 2011 survey), but it has enabled us to conduct controlled longitudinal analysis to explore changes experienced by individuals over time and how these changes differ according to their experience of regeneration.

Qualitative research moves our study beyond discussions of prevalence and statistical associations, and allows us to explore in more detail how residents view their own experiences. From this we can assess, for example, whether residents consider regeneration to be a major or minor part of their lives, and which aspects of regeneration affect them. As well as yielding deeper insights into people's experiences, feelings and beliefs, qualitative research findings can be brought alongside those from quantitative studies, to explore similarities and differences. Qualitative data can also be used to help generate hypotheses about causal pathways and suggest explanations

for findings obtained using quantitative methods.

All of these approaches to research and analysis are included in the research synthesis presented in this report. The report is split between cross-sectional findings on associations between health and place, and research of various kinds comparing population sub-groups who have contrasting experiences of regeneration. Each section covers a range of health outcomes including health behaviours, health service use, physical and general health, and mental health or wellbeing. Data are also drawn from different GoWell surveys. In order to provide as complete a view as possible we have not focused only on the most recent findings but rather used findings from throughout the life of the programme. However, some questions have not been asked in all three survey waves, limiting our ability in these cases to describe changes over time.

Any behaviour that can potentially affect a person's health is a 'health behaviour' but health researchers often focus on a relatively small number of key topics such as diet, physical activity, smoking, and the consumption of alcohol – and these are the types of health behaviours covered in the GoWell surveys.

Improvements in residents' health behaviours could be a potential outcome of regeneration. For example, improvements to the quality and safety of neighbourhood environments could encourage more people to walk around the neighbourhood and provide opportunities for other physical activities. Health behaviours are also important mechanisms by which regeneration can 'get under people's skin'[1]. If certain types of regeneration do help people to adopt healthier behaviours, this may lead to further health benefits such as improved mental wellbeing, lower rates of physical morbidity and reduced mortality. Self-reported health behaviour data can, however, be particularly problematic[10]. They often rely on assumptions that participants are able to define, recall and quantify activities and consumption patterns in an accurate and standardised way. These assumptions may not be justified (there are widely reported issues, for example, about people's accuracy in reporting their alcohol consumption; and understanding of what constitutes a portion of fruit or vegetables), and we therefore have to interpret with caution the absolute levels of behaviour reported. However, analyses of changes over time and differences between subgroups are likely to be more reliable.

Diet

On the question of diet, we have focused particularly on 'snacking' – on the grounds that our participants seem to have found questions about snacks easier to answer than questions about 'portions' of fruit and vegetables[i].

There are many types of snack and some are often considered healthy while others are considered unhealthy. Our wave 2 questionnaire asked about two types of snack in particular. Participants were asked if, in the last 24 hours, they had snacked on a 'packet of crisps or similar' (treated in our analysis as the unhealthy choice), or if they had snacked more healthily on an item of fruit. We also asked about drinks people consumed, focusing on fizzy soft drinks (considered less healthy) or unsweetened fruit juice (considered healthier).

It is sometimes assumed that deprived areas have few healthy food outlets, and that this may be an environmental

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[i] Surveys that focus on portions generally devote more space than we had available to providing detailed definitions of the types and quantities of food being asked about (and even these questionnaires are often considered to be unreliable)[11].

factor that can help explain why diets in disadvantaged areas are generally poor. Most people in Glasgow live relatively near shops that sell food, but previous studies have looked at whether or not the type of food being sold in local shops varies by area deprivation. We found that the findings from these previous studies have been mixed, particularly as many disadvantaged neighbourhoods (including GoWell neighbourhoods) are located near supermarkets or other shops that sell a wide range of healthy and unhealthy products[11].

Using mapping software, we measured residents' proximity to food outlets, and in particular outlets considered to sell nutritious food[12]. We found that proximity to healthy food outlets varied from one locality to another. Furthermore, *healthy* snacking was associated with living near to (up to ten minutes walk away from) a supermarket; it was also associated with living up to 15 minutes walk away from other shops selling nutritious food. These findings are important because they suggest that even though disadvantaged areas may have access to nutritious food outlets, this access is not uniform and a relative lack of access is associated with less healthy dietary behaviours (at least where snacking is concerned).

We also found associations between snacking and psychosocial aspects of the home and neighbourhood environment. Feeling secure at home and feeling that the neighbourhood has changed for the better over the previous two years were both associated with healthier snacking. We think it plausible that (a) the psychosocial benefits that some residents derive from

their home and neighbourhood may influence their health behaviours; and/ or (b) that people who are generally positive about their lives may demonstrate this positive attitude through their health behaviours and their appraisals of home and neighbourhood.

Alcohol

Alcohol has been linked to a variety of health problems. In addition, 'people being drunk or rowdy in public places' is one of the neighbourhood behaviours most commonly cited as problematic by our survey respondents[13]. The negative impacts of drunkenness on communities has also been a recurring theme in our qualitative research into residents' neighbourhood experiences. Furthermore, geographical analysis of routine data on neighbourhood characteristics and crime in Glasgow has found that the number of licensed alcohol outlets in an area was strongly associated with relatively high local crime rates[14].

The self-reported alcohol data from our participants are therefore surprising. They suggest that GoWell respondents tend to drink less than the national average and that a greater proportion of the GoWell sample abstain entirely from alcohol in comparison to the Scottish population. Furthermore, these differences between GoWell and national figures are large. For example, 44% of our respondents reported in 2008 that they never drink alcohol. A further 24% said they drank alcohol occasionally but had not done so in the last seven days. The Scottish Health Survey, 2008, reported that 13% of women and 11% of men across Scotland did not drink at all. An additional 18% of women

and 8% of men told the Scottish Health Survey that they had drunk less than one unit's worth of alcohol in the previous week[13,15].

There is a reported tendency towards polarised alcohol consumption among more disadvantaged populations: more people reporting drinking to excess and more people claiming not to drink at all[14]. The potential problem with our data is that they demonstrate the latter (greater abstinence) to a surprisingly large degree, but provide less evidence of the former (more drinking). It is possible that our findings under-represent the true level on alcohol consumption, although there is no obvious way to demonstrate this claim or explain why it may have occurred. Possible explanations include factors to do with the composition of our sample, and factors to do with reporting bias (e.g. confusion over the questions, or an unwillingness to admit to drinking).

Neighbourhood and housing characteristics tend to vary between our participants who state that they don't drink alcohol and those who do drink. Abstention was more common in the TRAs than the other area types, and more common among high-rise flat dwellers than residents who live in other types of building. High-rise flats, particularly those located in the TRAs, contained more residents born outside the UK (e.g. asylum seekers, refugees and economic migrants). Around three out of every four of our participants born outside the UK (76% in 2008) stated that they abstain from alcohol, compared with one out of every three participants born in the UK (35%)[13]. Therefore, non-UK born participants tend to boost alcohol abstention rates in the

GoWell areas that house them. That said, across the whole sample the majority of abstainers (n=1,297 in 2008) came from our UK-born participants (most of whom were born in Scotland), and only a minority of abstainers were born overseas (562 abstainers were not born in the UK in 2008).

In addition, men were more likely to drink than women; people living with children reported alcohol consumption more than adults in childless households; and older working age adults (40-64 years old) were more likely to drink than younger adults or retired people. Two proxy indicators of higher social status were also associated with drinking: being employed as opposed to unemployed or in education; and living in an owner-occupied home rather than renting[13].

Smoking

Unlike the alcohol figures discussed above, smoking prevalence among our participants was closer to what we expected from disadvantaged Scottish neighbourhoods. Self-reported smoking prevalence among our respondents was 40% in 2008, almost identical to the figure reported in that year's Scottish Health Survey for the population in Scotland's most deprived quintile (as measured by the Scottish Index of Multiple Deprivation)[16]. In contrast, across all of Scotland's population, 27% of men and 25% of women over the age of 16 years reported being a smoker in 2008. These findings are consistent with other evidence that demonstrates the link between area deprivation and smoking[13,15].

The fact that our data on smoking prevalence are consistent with national figures for a similarly deprived population helps us be more confident about the reliability of our smoking data. A closer look at smokers' characteristics allows comparison of the social patterning of smoking with the social patterning of drinking within the GoWell population[13].

Echoing the figures for alcohol, the lowest prevalence of smoking was in the TRAs. Residents of high-rise flats (along with houses) had lower smoking prevalence then those in low-rise flats; and residents born outside the UK were particularly unlikely to smoke. Similarly, males and older working age adults were particularly likely to smoke (just as they were more likely to drink)[13].

However, the proxy indicators of social status – housing tenure and employment – tell a different story. Whereas drinking was associated with home ownership and employment, being a smoker was associated with social renting and unemployment. Adults who lived without children, particularly single working age men, were more likely to smoke, while adults who lived with children were more likely to drink[13]. Smoking seems to be more strongly associated with markers of deprivation and exclusion than does drinking.

Physical activity and inactivity

Physical inactivity increases the risk of many chronic diseases such as coronary heart disease, type 2 diabetes, and cancer of the colon[17]. Most sports are a form of physical exercise but everyday activities such as walking, gardening or housework also help to reduce sedentary time. Engaging in everyday, moderate physical activities, even for relatively short times on most days can bring health benefits. These everyday activities have distinct advantages from a public health perspective: most people can engage in them to some degree, they are cheap or free, and they conveniently fit into people's everyday life. There are also environmental justifications for choosing active travel over motorised transport[18].

We looked at whether people's everyday physical activities are associated with characteristics of the place they live in; and we focused particularly on neighbourhood walking because we hypothesised that if regeneration interventions were successful in making people feel better about the area they lived in, this could potentially encourage an increase in neighbourhood walking[19].

In the 2006 survey, residents were asked *'In a typical week, on how many days do you go for a walk around the neighbourhood?'* Overall, 29% of respondents reported walking around their neighbourhood on five or more days per week but this figure varied widely by study area (ranging from 10% to 51%). Frequent neighbourhood walking was more common in the PEs (35%) than in the inner-city neighbourhoods regardless of whether those inner-city neighbourhoods had relatively high or low density dwelling designs. In the higher density inner-city neighbourhoods (post-war estates dominated by multi-storey flats) 26% of participants reported frequent neighbourhood walking, whereas in lower density inner-city neighbourhoods

(dominated by cottages and tenements with single or shared gardens) the figure was 28%[19].

Unsurprisingly, respondents who were older, whose physical health was poor, or who had specific health problems were less likely to walk frequently. Neighbourhood walking did not vary by measures of socioeconomic status (although our analyses are limited by the fact that our sample does not have a substantial amount of variation in socioeconomic status since most participants are relatively deprived).

People were more likely to walk frequently in their neighbourhood if they felt a sense of belonging to the place where they lived, considered the community cohesive, and if they felt the streets were safe to walk in at night. However, people who expressed higher levels of trust in others living in their area, were less likely to walk frequently[ii].

Walking was associated with aspects of the physical environment in a number of ways. First, the presence of local amenities that support physical activity was important. Respondents who used local sporting facilities, parks and play areas were all more likely to walk frequently in their neighbourhood. In the case of parks and open spaces, respondents were more likely to walk if they also believed that those facilities were of good quality. Third, the use of other types of local amenities was also associated with frequent neighbourhood walking: for example, general shops, social venues, libraries and even fast food outlets. Frequent neighbourhood walking was also found to be associated with better physical and mental health[19], although the direction of causality here is not yet clear.

Table 2 below outlines who has the least healthy behaviours when we look at some personal, social status and home type characteristics.

Table 2. Who has the least healthy behaviours?

	Diet	Alcohol	Smoking	Physical activity
Gender	Men	Men	Men	Women
Age	Working age	Middle age	Middle age	Retired
Country of birth	UK	UK	UK	UK
Employment	Unemployed	Employed	Unemployed	Retired; sick; unemployed
Tenure	Renters	Owners	Renters	Renters
Building type	High-rise flats	House; low-rise flats	Low-rise flats	Low-rise and high-rise flats

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ii These analyses control for other factors like age, gender, ethnicity and level of education.

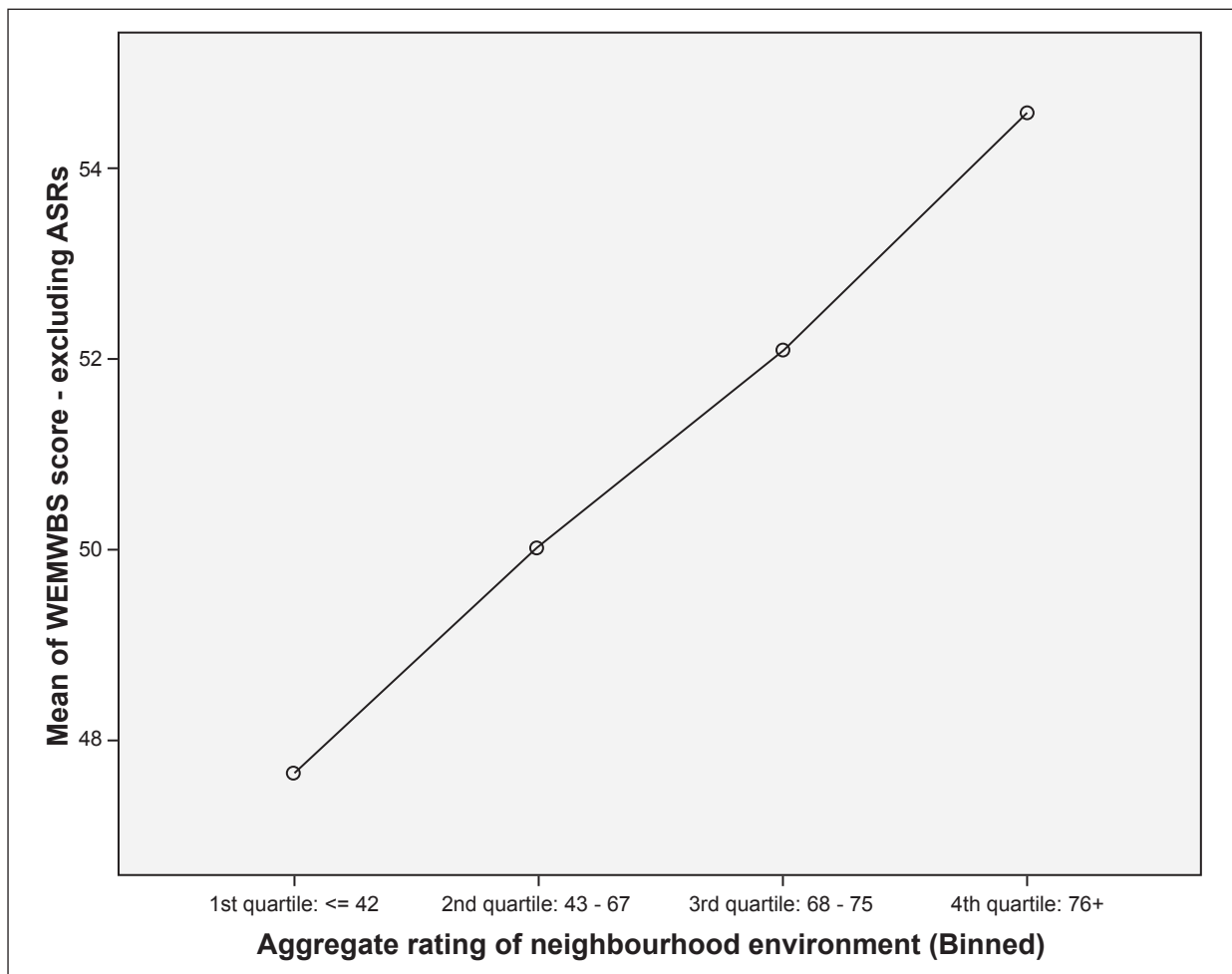# 4 Findings on mental wellbeing

Systematic review evidence suggests that mental health and wellbeing are key health outcomes that can result from regeneration. Consequently, a strand of our cross-sectional research has explored mental wellbeing and its associations with various characteristics of people and place.

The findings generally provide evidence to support the link between mental wellbeing and the quality of local environments. An analysis of our wave 2 (2008) survey data, using the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS)[20] as a measure of mental wellbeing, found that people who reported that their home had a 'very good' external appearance were also more likely to have higher WEMWBS scores (a higher score indicates better mental wellbeing). The quality of front doors was a characteristic of people's homes that had particularly strong, positive associations with mental wellbeing. This is of interest because replacement front doors are the most frequently implemented housing improvement in Glasgow's regeneration programme. A good quality door can add aesthetic value to a home but also be valued in terms of feelings of security and control[21].

Associations with wellbeing were particularly strong in cases where environmental characteristics were rated as 'very good' rather than merely 'good'. Figure 3 shows that respondents who considered the attractiveness of their neighbourhood to be 'very good' rather than 'poor' were three times more likely to have high mental wellbeing. This also applies to the home characteristics discussed above and neighbourhood aesthetics: residents who reported that their neighbourhood had very good aesthetic qualities were likely to score more highly on WEMWBS[21]. We do not yet know if these associations are causal (with the environment having an influence on mental wellbeing) but if they are, the findings suggest that environmental improvements need to achieve a high level of quality if they are to impact on residents' wellbeing. Such associations are consistent with the idea that homes and neighbourhoods are important restorative environments for people to relax and recover in.

Figure 3. Attractiveness of neighbourhood environment and mean WEMWBS scores.

Psychosocial characteristics of the home and neighbourhood also had strong associations with mental wellbeing. People who thought that their residential environment helped them feel they were doing well in life tended to report better mental wellbeing (see Figure 4).

Similarly WEMWBS scores tended to be higher among people who believed that their home made them feel in control and where people believed that local residents thought highly of the neighbourhood, i.e. it had a high 'internal reputation'[22].

Figure 4. Neighbourhood makes me feel like I am doing well in life and mean WEMWBS scores.
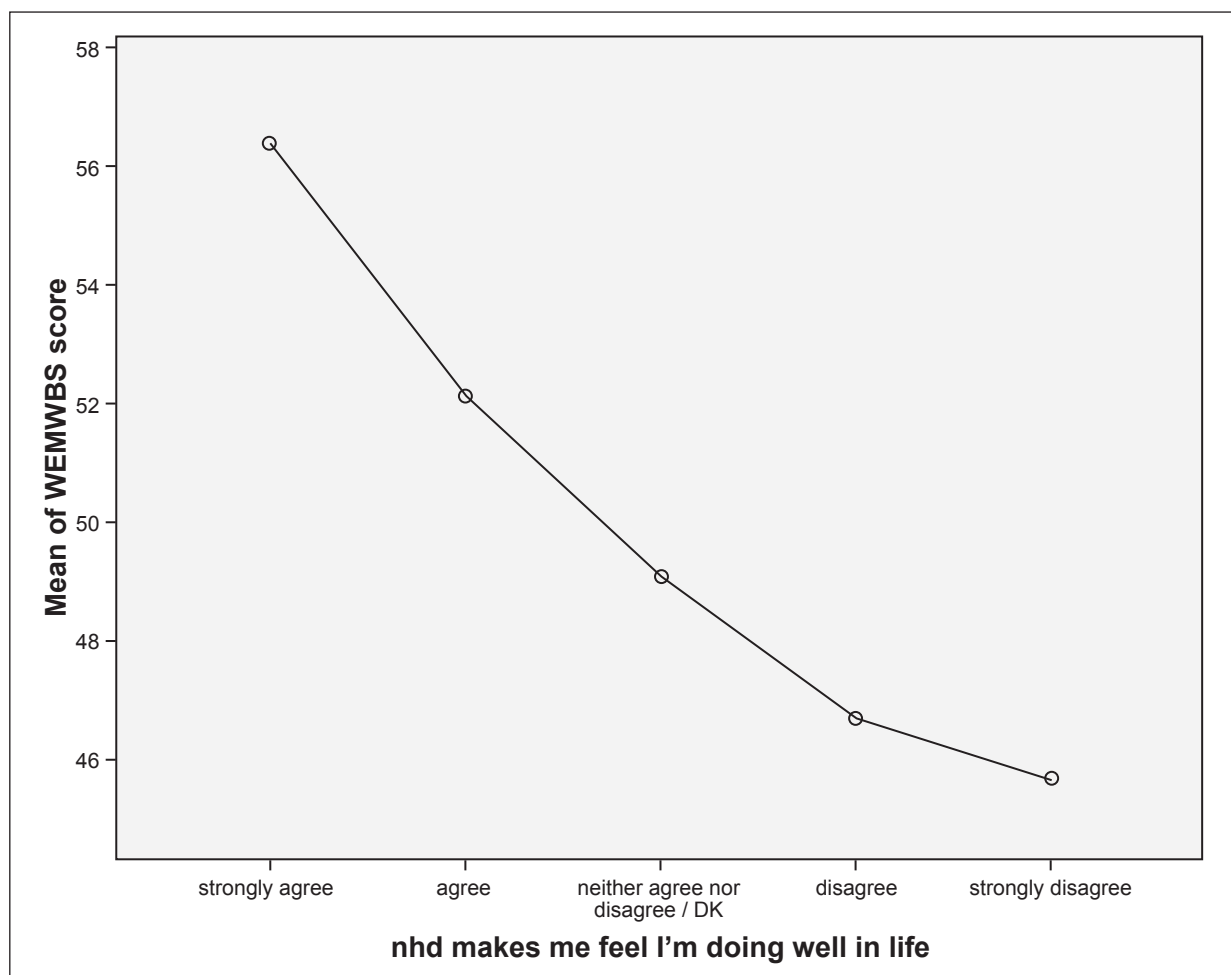
Relative social positioning provides a further mechanism by which the psychosocial environment was associated with mental wellbeing. It has been theorised that people's assessment of their own social status may have associations with health and wellbeing that are independent of material or economic markers of status. It has also been theorised that people may make different types of social comparisons to help them assess where they are positioned on the social scale. We found evidence that people who positioned themselves, their home or the neighbourhood relatively favourably compared with others were more likely to have a higher WEMWBS score (compared to those who positioned these aspects of their lives lower down the social scale). Our findings suggest that these very local comparisons people make may be more important to wellbeing than previously thought[23].

Another theory to explain how residential environments may influence health through psychosocial pathways relates to residents' sense of empowerment, and in particular their relationship with local service providers. This is one of the 'fundamental determinants of health' described earlier. 'Empowerment' can be conceptualised in various ways. Our survey includes questions that refer to different levels or 'doses' of empowerment: the most basic level is simply being satisfied with a service provider; a second level refers to whether or not residents feel the service provider gives them adequate information about their plans and activities; and a third level considers reciprocal engagement in which residents feel they can influence the service provider's decisions. Typically, our respondents were most likely to provide a positive answer in response to the satisfaction questions and least likely to respond positively to the participation question, but all three levels of empowerment were found to be positively associated with mental wellbeing[21,22].

Specifically, in relation to local community empowerment, we asked residents three questions: whether they can influence decisions affecting their local area, on their own or with others; whether people in the area are able to find ways to improve things if they want; and whether the council and local service providers are responsive to people's views. We created a local empowerment score from all three answers and this showed a linear relationship with mental wellbeing scores as shown in Figure 5.

Figure 5. Local empowerment and mean WEMWBS scores.
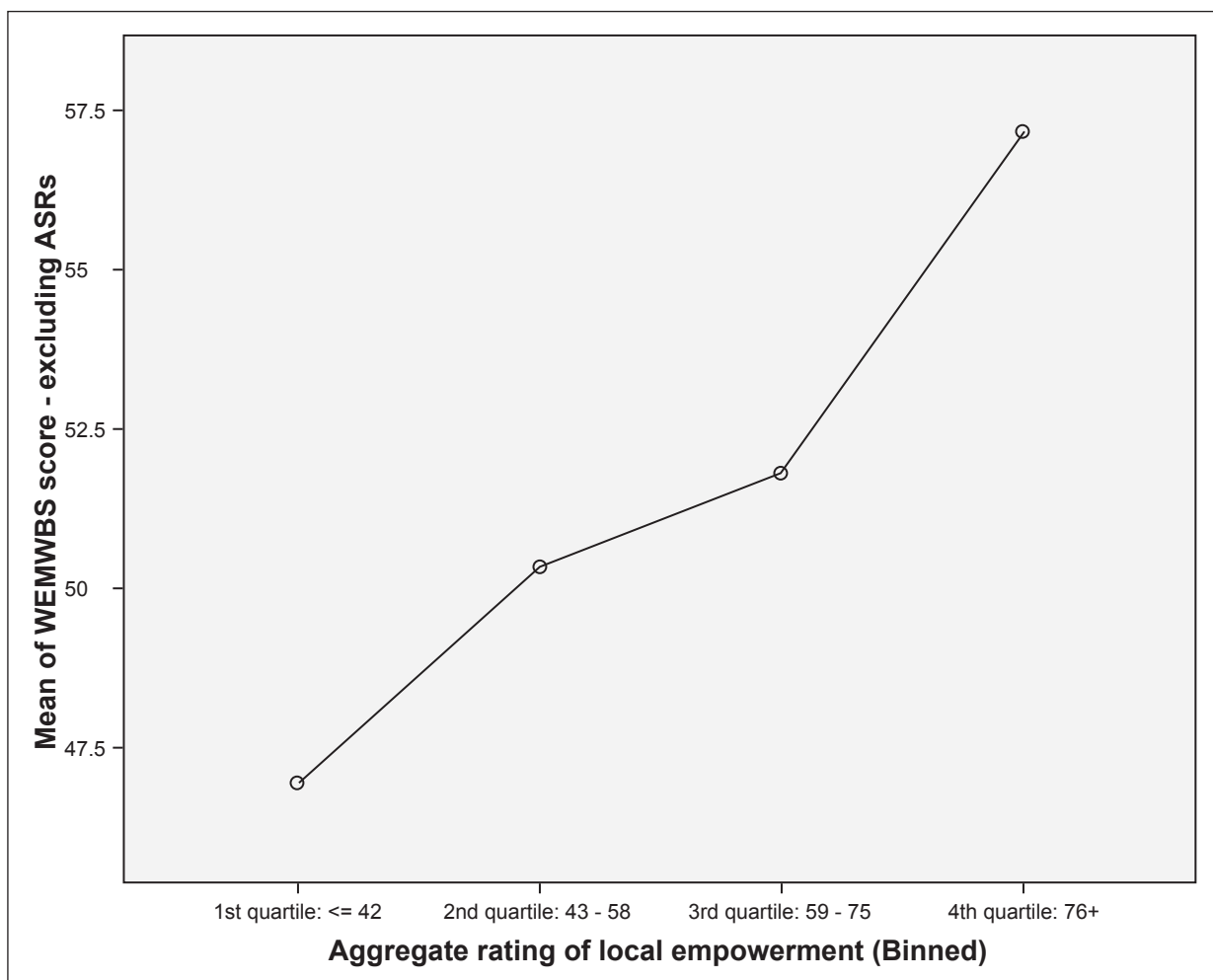
The findings described above are relevant to the planning of home and neighbourhood interventions, but they do not describe how such interventions may have affected residents. There are other GoWell outputs that have focused on area-based regeneration and its impacts. These are considered below.

Housing improvements

Across all our study areas there has been an extensive programme of housing improvement driven by national and local changes to Housing Quality Standards[24]. Properties have received internal and external improvements according to need – including improved roofs, external cladding, doors, windows, bathrooms, kitchens, heating and electrics[13]. Registered Social Landlords (RSLs) are compelled to ensure that all their properties meet the new national standard by 2015. RSLs manage social rented and, to a lesser extent, owner-occupied properties (as factors). The scale of the improvement programme required an incremental approach spanning the available time period and, in effect, creating a 'waiting list' for improvements. In spite of this incremental approach, housing improvement was arguably the most widely implemented physical regeneration intervention in the early years of GoWell. In 2008, 36% of our respondents reported receiving housing improvement during the previous two years[13].

There is research evidence demonstrating that housing improvement can benefit residents' health[24-27]. A systematic review found that improvements in respiratory, general and mental health have been observed following housing improvement[25]. However, much of the identified evidence of health benefits came from studies of interventions that target homes with specific health risks – most notably heating improvements for cold, damp dwellings. Hence, the review concluded that the "potential for health benefits [from housing improvement] may depend on baseline housing conditions and careful targeting of the intervention"[25]. The improvement work we have evaluated was targeted to a degree, in that homes were managed by RSLs, located in disadvantaged neighbourhoods and were assessed to be in need of intervention. However, improvements were designed to meet generally applied housing quality standards. To this extent, we explore the impact of less targeted, population-level housing improvement programmes on mental health.

Mental and physical health

We identified a nested longitudinal cohort (n=1,041) from two cross-sectional surveys (from 2006 and 2008) of householders experiencing different types of urban renewal in Glasgow, hypothesising that home improvements would benefit residents' health in the short term and testing the hypothesis by comparing those participants who reported receiving

housing improvement between 2006 and 2008, with those who did not (using the latter as a control group). We used a validated tool known as SF12 (version 2)[28], for measuring self-reported mental and physical health at wave 1 (2006) and wave 2 (2008), and controlled for a number of potential confounders.

Our findings suggest that housing improvement *probably* had a small benefit to residents' mean mental health in the short term[26]. This rather cautious statement reflects the fact that the improvement we detected was statistically significant, but only just. The SF12v2 survey is designed to be divided up into a number of subscales describing different dimensions of mental health. These include four physical health subscales dealing with physical function, bodily pain, general health and the extent to which physical health limits everyday roles. It also includes four mental health subscales focusing on vitality, social functioning, role limitations and a mental health subscale combining questions on anxiety and depression. Importantly, our analysis found significant improvements in the social functioning and mental health subscales following housing improvement. We also found some evidence to suggest that mental health benefits were experienced more among residents with no educational qualifications compared to residents with educational qualifications. We found no evidence that other demographic characteristics (e.g. gender, age, household structure and country of birth) interacted with self-reported health as measured by SF12v2. We also found no evidence of intervention effects on self-reported physical health following housing improvement[26]. However, this analysis relied on occupants' own

reporting of housing improvements to their homes. Therefore, we are intending to repeat this analysis in the near future using a larger longitudinal sample from our three survey waves, as well as objective records from Glasgow Housing Association on housing improvements carried out to properties. In this way, we can better assess the tentative findings we have reported so far on the health impacts of housing improvements.

Smoking and intention to quit

As mentioned earlier, smoking is strongly socially patterned – being a much more common behaviour now in poorer communities than in more affluent areas. Smokers living in areas of multiple deprivation are also less likely to quit smoking[27]. This may be due to a number of factors such as barriers to accessing cessation programmes; more deep-rooted reasons for smoking in the first place, such as having to deal with undesirable environments and circumstances, and coping with stress; or being exposed to more pro-smoking factors at the personal and community levels, such as cigarettes being more available, social norms more supportive and more permissive attitudes[29].

Such explanations have led to considerations about whether making changes to residential environments might influence smoking rates. Although there are few studies of regeneration and tobacco consumption, one of the largest health effects reported from a housing improvement study has been a reduction in smoking[30]. Blackman *et al.*'s study of 98 households and 209 participants reported a 50% reduction in smoking for those who had received a housing improvement

compared to those who did not[30]. This is an unusually large effect which, if generalisable, would clearly have important public health implications. So it was surprising that we were unable to identify any other published studies that used quasi-experimental methods to measure the impact of housing improvement on smoking. Blackman et al. also proposed this reduction might be due to a decrease in stress but were unable to demonstrate this proposed relationship in their study: therefore we included mental health and wellbeing variables in our analysis.

In contrast to the Blackman *et al.* study, we found that providing residents in disadvantaged areas with better housing *did not* lead to a reduction in smoking, but, rather importantly, housing improvement was associated with *intention* to quit[29]. Improvements in mental health did not explain this association. Housing improvement in Glasgow may not be sufficient to significantly reduce smoking rates, but such improvements may provide a 'critical moment' for more targeted smoking interventions. The implication of our finding is that linking health services to housing projects might provide an opportunity to develop interventions that capitalise on this 'critical moment', although such interventions should be evaluated for effectiveness[29].

Clearance, rehousing and demolition

Quantitative findings

Four GoWell areas have experienced substantial housing clearance and demolition (although not all to the same

degree). The academic literature on this type of regeneration has often highlighted negative consequences. For example, Paris and Blackaby noted that such programmes have "frequently been accused of the 'destruction of communities'"[31]. This alleged 'destruction' is partly a social phenomenon involving the separation of neighbours and closing down of amenities which may have been used as social hubs (e.g. schools, community centres, cafés, and so on). It is also a physical phenomenon that increases the proportion of derelict properties, turns neighbourhoods into worksites and buildings into rubble[32,33]. Furthermore, large-scale clearances can take years to complete, during which time residents who wait to be relocated remain exposed to local environments that steadily worsen[33]. Given this background, we hypothesised that residents who spent two years living in neighbourhoods undergoing clearance and demolition would experience worsening health. We tested this hypothesis, drawing on the nested longitudinal cohort identified from linking participants from the 2006 and 2008 surveys (as described above)[26].

In fact, we found no evidence from our primary analysis to substantiate this hypothesis and in addition, some evidence from our subscale analysis appeared to repudiate it. Comparing the demolition group to the control group, there were no significant differences in the way that average mental health or physical health scores changed over time. Seven of the SF-12v2 subscales showed little or no intervention effect, while social functioning significantly improved in the demolition group relative to the control[26].

These findings are surprising, given current understandings in the literature. If neighbourhood environments can deteriorate without substantially affecting residents' health, this raises questions about assumed causal pathways. If the findings do indeed reflect the experience of residents living in areas undergoing clearance/demolition, we might speculate a number of possible explanations for this: (a) harmful neighbourhood effects may have been a significant problem prior to 2006, potentially lessening the negative impact of the demolition programmes; (b) some residents may have viewed the clearance and demolition programmes positively (previous GoWell research suggests a majority of Remainers supported demolition[13]); (c) the interventions could have been delivered in ways that helped reduce potential negative impacts on residents; and (d) the residents who remained in the demolition neighbourhoods during the two-year period may have been particularly resilient compared to r esidents who relocated in the early phase of clearance.

Qualitative findings

Using qualitative methods we explored in more detail the experiences of residents who lived in neighbourhoods undergoing clearance and demolition[33,34]. In terms of the four possible explanations stated in the previous paragraph, the qualitative study found that: (a) many of the residents' accounts included descriptions of long-running and complex problems with their homes and neighbourhoods – problems that predate the regeneration programme and which lend further weight to the view that urgent action has been necessary to transform the residential environments for these communities;

"I'm still cold….Because I told you, water's coming everywhere, you cannae make it warm." (Ali)

"Obviously somebody must have been in it [the lift] before us, so you've either got drink, hash or there's a smell of pee or something….Sometimes you've got to go in and honestly, and quite a lot of times you've got to go in and just put your jacket over your mouth." (Keith)

(b) a desire to leave homes and the neighbourhood was a common theme, although not all the participants shared this view;

"Well it'll be nice not to be in a damp house. And somewhere that was reasonable to heat, you know." (Sue)

[Hopes relocation will bring] Peace, contentment, feeling safe in your own house, a house that you can live in and that you're not ashamed to bring people intae – because this house is a mess." (Alison)

"I'll definitely miss my kitchen, just for my view. I like looking oot the window." (Jackie)

and (c) the clearance and relocation process was portrayed positively in some (but not all) participant narratives, particularly the role of local housing officers.

"…very good…if you want to talk something, he [the housing officer] listens to me." (Nadia)

"They pick and choose what tenant they think's going to be respectable, to move into they blocks. That's al' pre-arranged." *(Harry)*

The study did not find any evidence to either support or refute the fourth explanation about greater resilience among longer-term Remainers[34].

The qualitative study participants suggested a range of perceived pathways and mechanisms by which their physical and psychological health might be influenced by their environment. Of particular relevance to housing-led regeneration, homes considered too small, damp and costly to heat were perceived by residents to have adverse health consequences in terms of mental wellbeing, childhood asthma and related illnesses[34].

"That's only two weeks ago I painted that [bathroom wall]. You see what has come up again. And damp here. Mould. And you look in my bathroom you see mushroom." *(Ali)*

"I'm very angry. … It's awful. …You know [they] can't, there's no way they can stay over…In case they get anything". *(Sue)*

"I've been in here and it has been driving me nuts. Because as I say the kids can go to their room, but I've got nowhere to go." *(Carol)*

However, many of the factors considered to have important health consequences were not directly linked to the physical condition of people's homes.

Figure 6 illustrates the various causes of ill health described by the residents who participated in our qualitative study[34]. Looking down the boxes on the left hand side of Figure 6, it is clear that although physical environments, particularly at home, were blamed for some health problems, social problems (including childhood and family problems) tended to figure more prominently in residents' narratives about the causes of their ill health. Social relationships and support structures within and beyond the local neighbourhood were considered to be important for a range of health and wellbeing issues.

Figure 6. Perceived causal pathways to health problems affecting participants or their families.
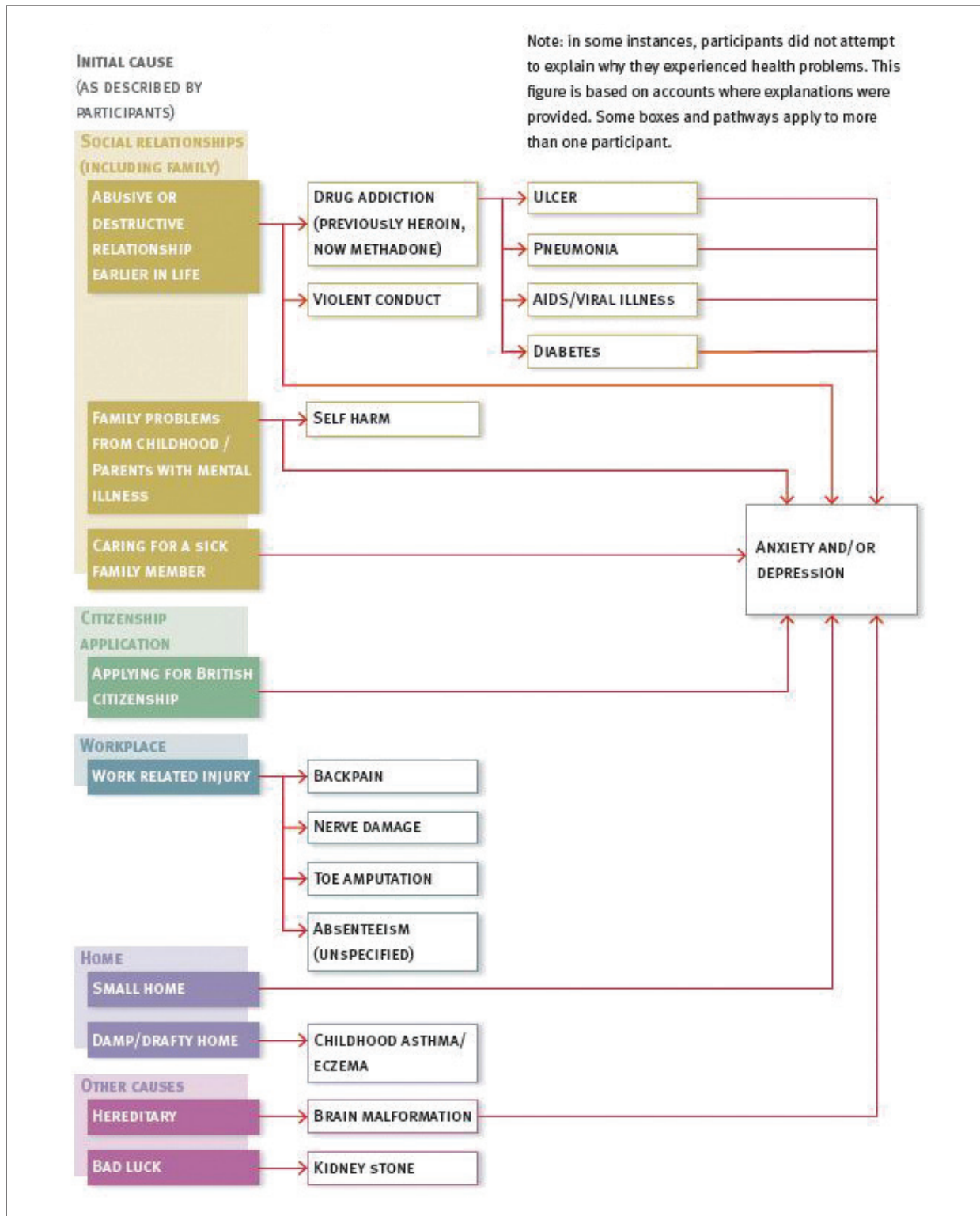
Reproduced from Egan M, Lawson L. Residents' perspectives of health and its social contexts. Glasgow: GoWell; 2012.

Participants also identified a number of factors which they considered to be beneficial to their health and wellbeing, including participation within the community; individual or community support from community organisations and professional services (e.g. health, police, housing, and so on); and relocation as part of the clearance and new build programme. Again, social interaction and support issues rather than the physical environment tended to feature most prominently in residents' accounts[34].

Therefore, a key message is that the social environment is perceived by residents to influence a greater range of health issues than the physical environments of homes and neighbourhoods. Therefore, we would expect the potential benefits of urban regeneration to be maximised when strategies include improvements to social as well as physical environments.

'Remainer' and 'Outmover' comparisons

We also conducted cross-sectional analysis that compared participants who remained in the three largest demolition neighbourhoods (the three TRAs) and participants who had recently relocated from those neighbourhoods. We refer to these two groups as 'Remainers' and 'Outmovers' respectively. A survey of Outmovers was conducted in 2009 and compared with Remainers from the main survey of 2008.

Most of the residents who relocated had moved to homes that were near to their original address, often in adjacent neighbourhoods[35]. Furthermore, residential outcomes for Outmovers (such as housing satisfaction) compared favourably with those for Remainers, and most Outmovers seemed to have settled well into their new area within a relatively short period of time. Many measures of social connectivity and feeling part of the community appeared more positive among Outmovers than Remainers.

However, Outmovers appeared to have worse physical health than Remainers[35]. Examples include general health, long-term illness (e.g. respiratory, cardiovascular, digestive and liver and kidney illness, and headaches), recent illness/symptoms (e.g. sleeplessness, migraines and headaches, palpitations or breathlessness, fainting or dizziness, chest pain, managing physical activities, persistent coughing) and General Practitioner (GP) consultations in the previous 12 months. Although Outmovers' health appeared to be relatively poor, there was some variation in health outcomes among this group. Notably, Outmovers who reported being satisfied with their new home were more likely to have favourable health outcomes. This was not specifically associated with the built form of the home, access to a garden or available space.

Mental health outcomes tended to be poorer for Outmovers. Across four measures of mental health based on SF12v2 subscales (Role Emotional, Mental Health, Vitality, Social Functioning), values were worse for Outmovers than Remainers[35]. On average, Outmovers and Remainers with a long-term health condition had similar mental wellbeing scores, but, surprisingly, Outmovers with no long-term conditions scored significantly

less well on this measure than did the equivalent Remainer group.

In some regards, Outmovers also reported less favourable health behaviour outcomes. Levels of smoking were generally high, but more Outmovers than Remainers smoked[35]. That said, Outmover smokers were more likely to have cut down since their move; and Outmovers who intended to give up smoking had more immediate plans to do so. Outmovers were more likely to drink alcohol than Remainers and moving appeared not to have influenced their alcohol drinking behaviour. Outmovers were significantly more likely than Remainers not to have walked anywhere for at least ten minutes in the past week, and were also less likely to have walked around their neighbourhood for 20 minutes in the past week.

Overall, the discrepancy between social and residential outcomes that consistently favour Outmovers, and health outcomes that favour Remainers is striking. Explaining this discrepancy is a challenge. We surmise from the longitudinal research referred to above, that Remainers' health changed little during this period, relative to that of other GoWell participants. Therefore, it is unlikely that the Remainers have tended to become healthier in absolute terms over time, while Outmovers have not. Nor do we have good reason to assume that Outmovers have become less healthy over time – given that the major change in their circumstances during this period appears to be a general improvement in their residential and social environment.

It is possible that unknown and/or unmeasured factors have prompted a different health trajectory for the two sub-groups. Outmovers did report greater difficulty meeting costs and paying bills and perhaps this economic hardship influenced health outcomes[35]. However, we consider that the paradox between improved environments and worse health is most plausibly explained in terms of the composition of GoWell's Remainer and Outmover subgroups[36].

The Remainer and Outmover samples were similar in terms of age group and gender, but differed in terms of occupational status, citizenship and household type. Outmovers were significantly more likely to be in non-retired, non-working categories (long-term sick; looking after the home/family); and to be British citizens (who in our sample tend to have worse health than participants born outside the UK). Remainers were significantly more likely to be either unemployed or retired; to be asylum seekers and refugees; and to be from two-parent families and older person households. We cannot tell the extent to which the differences between the Outmover and Remainer samples are due to real differences between the groups or due to any bias in the way we have obtained the samples, though it is possible that we were less successful in tracing non-British citizens[36].

We intend to examine again both health outcomes and changes in health behaviours for Outmovers from regeneration areas, as well as for other house movers in the near future to try to gain a better understanding of whether moving home has any consequences for health in our study population.

The previous sections have looked at the associations between people's housing and neighbourhoods and their physical and mental health and health behaviours; and then examined some evidence from our longitudinal cohort studies regarding the impact of regeneration (including moving homes due to demolitions) on health and health behaviours. While these longitudinal data are valuable they are also limited at the moment to two time periods. In this section therefore we examine changes in health and health outcomes from our three cross-sectional community surveys which encompass a six-year period (undertaken in 2006, 2008 and 2011). In particular this section focuses on differences over the full time period between 2006 and 2011.

There are several reasons why we might see changes (either improvements, declines or no change) in the various health outcomes we are studying and in the different types of regeneration areas. We may see changes in these areas due to secular trends (e.g. a decline might be due to economic recession affecting our participants and others in Scotland). We may also see changes in health due to changes in neighbourhood composition (regeneration can involve the movement of people in and out of neighbourhoods). Of course, we could also see changes in health that could have occurred due to changes in neighbourhood context resulting from regeneration interventions. In this section we compare changes over time *within* each area type (tested by statistical tests) and across area types, adjusting for the sociodemographic make-up of the areas and how that may have changed from 2006 to 2011.

General health

Generally, self-reported health appears to have declined since 2006 across all the GoWell intervention area types, although the rate of decline varies by area type. Percentages of residents reporting good, very good or excellent health have fallen by 4-15% in the intervention types. This decline is not explained by any changes in the sociodemographic make-up of the residents in the areas. The decline also appears to be counter to Glasgow's general trend, as Scottish Health Survey findings from the geographical area covered by Greater Glasgow and Clyde NHS Board suggest that self-reported health improved from 69% claiming to have good or very good health in 2003, to 74% in 2011[iii].

[iii] Data provided to GoWell on request by the Scottish Government. Thanks to Rosalia Munoz-Arroyo.

Mental wellbeing

We assessed positive mental wellbeing only in 2008 and 2011 (not 2006). Residents in the TRAs showed a significant increase (about 2 percentage points) in mental wellbeing; other areas showed smaller, but not statistically significant increases; and residents in the HIAs reported a decrease in their wellbeing. While positive mental wellbeing has not changed substantially over the period in most of the area types, in each case the mean WEMWBS scores at 2011 are higher than the national and Glasgow averages, as measured by the Scottish Health Survey[15]. In addition, the mean WEMWBS scores for Glasgow and Scotland changed little during the 2008-2011 study period.

Primary care

Self-reported levels of General Practitioner (GP) consultation increased between 2006 and 2011, both for 'any' health problem and for mental health problems. Consultations increased particularly in the LRAs. While these findings likely reflect self-reported decline in health over time, they may also indicate a greater willingness to access health services.

Health behaviours

As discussed above, changes to health behaviours may contribute to changes in health outcomes, and behaviour change may predate any changes in general physical or mental health. We found small improvements in diet (reductions in the frequency of fast food consumption) which varied by area type (6% to 14%), but after adjusting for the sociodemographic

characteristics at each measurement point, these reductions were only statistically significant for the TRAs and LRAs. There was a small decrease in smoking rates (which was not statistically significant) and no significant change in those reporting intending to quit smoking. We also found a significant increase in those reporting drinking alcohol (8% to 23% increases), and there were some small but not statistically significant increases in physical activity (as assessed by people undertaking at least 20 minutes walking in the neighbourhood on five or more days a week).

We have presented a lot of findings, and it is challenging to interpret clear messages from them. We are also aware that, although housing improvement is now well advanced, the processes of transformational regeneration are still at a relatively early stage in some of our study areas. Similarly, we are still at a mid-stage in our research. Wave 3 findings are not fully analysed and the longitudinal analyses are at a relatively early stage. Our findings therefore need to be interpreted in that context.

1. We have shown clear associations between neighbourhood amenities and health-related behaviours. Specifically, people are more likely to walk if their neighbourhood has amenities for residents to use, and which are of good quality; and people are more likely to eat healthier snacks if they have access to supermarkets or other food outlets within a reasonable distance from their home.

2. Mental wellbeing appears to be the most sensitive health indicator for GoWell. We have found associations between mental wellbeing and a wide range of home and neighbourhood characteristics, including: neighbourhood aesthetics; the external appearance of the home; the appearance and security of the front door; a feeling that the home and neighbourhood give a sense of personal progress; and sense of control in the home. It appears that, in at least some of these cases, the home and neighbourhood characteristics need to be *very* good/achieve a high level of quality for the positive mental wellbeing links to be evident.

3. *How* the interventions are progressed also seems to be important. For example, mental wellbeing is associated with feelings of empowerment; and we have shown elsewhere that those who are relocated have more positive outcomes when they report being given a greater degree of choice during the process, and those who receive housing improvements derive more benefits thereafter when they have a positive view of their landlord's service as a whole[37].

4. We have also shown some indications of health benefits associated with the interventions we are studying. Housing improvement is associated with increased intention to quit smoking (though not with quitting itself). Housing improvement also brings small mental health benefits – at least in the short term. Relocation seems clearly associated with a number of social and community benefits (which may yield other benefits over time), although not at this stage with improvements in health behaviours or health outcomes. Residents in areas undergoing major transformational regeneration do not seem to be

experiencing the health detriments that might be expected on the basis of previous research.

5. Our repeat cross-sectional survey data also indicate some encouraging findings in the TRAs – the GoWell areas with the highest levels of need. If these continue and are replicated in further analyses, they highlight the potential of regeneration to reduce the health gap within Glasgow.

6. Overall, however, self-reported general health is worsening in our study areas and this is contrary to the picture for Greater Glasgow and Clyde as a whole. GP visits are increasing.

7. A strong message from the qualitative research findings from residents in the TRAs is that the social environment is perceived by these residents to influence a greater range of health issues than the physical environments of homes and neighbourhoods.

This report started with a recognition of the scale and duration of change that will be required to impact on the long-established population health challenges in these areas of Glasgow. It concludes with a recognition that the change process is still in progress and that evidence of health benefits are, to date, limited. This is probably to be expected.

We are committed to distilling implications for policy and practice where possible throughout our study. The findings summarised above clearly reinforce the need to move from an area-based approach that involves tackling different issues in communities separately, to one which builds up fundamental community resources (knowledge, power, social connections, information and so on), and ultimately to one which is more holistic.

References

1. Kearns A, Tannahill C, Bond L. Regeneration and health: conceptualising the connections. *Journal of Urban Regeneration and Renewal* 2009;3(1):56-76.

2. Beck SA, Hanlon PW, Tannahill CE, Crawford FA, Ogilvie RM, Kearns AJ. How will area regeneration impact on health? Learning from the GoWell study. *Public Health* 2010;124(3):125-130.

3. Scottish Public Health Observatory. Health & Wellbeing Profiles 2010. Available at: http://www.scotpho.org.uk/comparative-health/profiles/2010-chp-profiles

4. Link BG, Phelan J. Social conditions as fundamental causes of disease. *Journal of health and social behaviour* 1995;35:80-94.

5. Walsh D. *Health and Wellbeing in Glasgow and the GoWell Areas – deprivation based analyses.* Glasgow: GoWell; 2008.

6. Turner S. *Health and Wellbeing in GoWell and Social Housing Areas in Glasgow.* Glasgow: GoWell; 2008.

7. Ellaway A, Benzeval M, Green M, Leyland A, Macintyre S. 'Getting sicker quicker': does living in a more deprived neighbourhood mean your health deteriorates faster? *Health Place* 2012;18(2):132-7.

8. Walsh D, Bendel N, Jones R, Hanlon P. *Investigating a 'Glasgow Effect': Why do equally deprived UK cities experience different health outcomes?* Glasgow: Glasgow Centre for Population Health; 2010.

9. Marmot M, Allen J, Goldblatt P, Boyce T, McNeish D, Grady M, Geddes I. *Fair Society, Healthy Lives: Strategic review of health inequalities in England post-2010.* London: The Marmot Review; 2010. Available at: www.marmotreview.org

10. Roberts K, Cavill N, Rutter H. *Standard Evaluation Framework for weight management interventions.* Oxford: National Obesity Observatory, 2009.

11. GoWell. *Briefing Paper 10: Glasgow's Deprived Neighbourhood Environments And Health Behaviours – What Do We Know?* Glasgow: GoWell; 2010.

12. Clark J, Kearns A, Ellaway A. Snacking Behaviours and the Residential Environment in Deprived Areas. *Health & Place (submitted).*

13. GoWell. *Progress for People and Places: Monitoring Change in Glasgow's Communities. Evidence from the GoWell Surveys 2006 and 2008.* Glasgow: GoWell; 2009.

14. Gowell. *Briefing Paper 20: Neighbourhood Structures and Crime in Glasgow.* Glasgow: GoWell; 2012.

15. The Scottish Government. *The Scottish Health Survey 2008. Volume 1: Main Report.* Edinburgh: The Scottish Government; 2009.

16. The Scottish Government. Scottish Index for Multiple Deprivation. Edinburgh: Scottish Government; 2009. Available at: http://www.scotland.gov.uk/Publications/2009/10/28104046/0

17. Chief Medical Officer. *At least five a week: evidence on the impact of physical activity and its relationship to health.* London: Department of Health; 2004.

18. Ogilvie D, Foster C, Rothnie H, Cavill N, Hamilton V, Fitzsimons C, Mutrie N, on behalf of the Scottish Physical Activity Research Collaboration (SPARColl). Interventions to promote walking: systematic review. *BMJ* 2007;334:1204-1207.

19. Mason P, Kearns A, Bond L. Neighbourhood walking and regeneration in deprived communities. *Health & Place* 2011;17(3):727-37.

20. Tennant R, Hiller L, Fishwick R, Platt S, Joseph S, Weich S, Parkinson J, Secker J, Stewart-Brown S. The Warwick-Edinburgh Mental Well-being Scale (WEMWBS): development and UK validation. *Health and Quality of Life Outcomes* 2007;5:63.

21. Bond L, Kearns A, Mason P, Tannahill C, Egan M, Whitely E. Exploring the relationships between housing, neighbourhoods and mental wellbeing for residents of deprived areas. *BMC Public Health* 2012;12:48.

22. Kearns A, Whitley E, Bond L, Tannahill C. Residential psychosocial environment and mental wellbeing in deprived areas. *International Journal of Housing Policy* 2012;12(4):413-438.

23. Kearns A, Whitley E, Bond L, Egan M, Tannahill C. The psychosocial pathway to mental wellbeing at the local level: investigating the effects of perceived relative position in a deprived area context. *Journal of Epidemiology & Community Health* 2013;67(1):87-94.

24. Communities Scotland. *Scottish Housing Quality Standard Progress Report.* Edinburgh: Communities Scotland; 2007.

25. Thomson H, Thomas S, Sellstrom E, Petticrew M. The health impacts of housing improvement: a systematic review of intervention studies from 1887-2007. *American Journal of Public Health* 2009;99:S681-S692.

26. Egan M, Katikireddi SV, Kearns A, Tannahill C, Kalacs M, Bond L. Impacts of neighborhood demolition and housing improvement on residents' health: a prospective controlled study of two natural experiments in urban renewal. *American Journal of Public Health* [in press]

27. Giskes K, van Lenthe FJ, Turrell G, Brug J, Mackenbach JP. Smokers living in deprived areas are less likely to quit: a longitudinal follow-up. *Tobacco Control* 2006;15(6):485-488.

28. The SF-12®: An Even Shorter Health Survey. Available at: www.sf-36.org/tools/sf12.shtml

29. Bond L, Egan M, Kearns A, Clark J, Tannahill C. Smoking and intention to quit in deprived areas of Glasgow: is it related to housing improvements and neighbourhood regeneration because of improved mental health? *Journal of Epidemiology & Community Health* 2013;67(4):299-304.

30. Blackman T, Harvey J, Lawrence J, Simon A. Neighbourhood renewal and health: evidence from a local case study. *Health & Place* 2001;7(2):93-103.

31. Paris C, Blackaby B. *Not much improvement: urban renewal policy in Birmingham.* London: Heinemann; 1979.

32. Kearns A, Mason P. Defining and measuring displacement: is relocation from restructured neighbourhoods always unwelcome and disruptive? *Housing Studies* 2013;28(2):177-204.

33. Lawson L, Egan M. *Residents' lived realities of transformational regeneration.* Glasgow: GoWell; 2012.

34. Egan M, Lawson L. *Residents' perspectives of health and its social contexts.* Glasgow: GoWell; 2012.

35. GoWell. *Moving Out, Moving On? Short to medium term outcomes from relocation through regeneration in Glasgow.* Glasgow: GoWell; 2011.

36. Mason P, Kearns A. *Sticking with it? Short to medium term outcomes of remaining in regeneration environments in Glasgow.* Glasgow: GoWell; 2012.

37. Clark J, Kearns A. Housing improvements, housing quality and psychosocial benefits from the home. *Housing Studies* 2012;27(7):915-939.

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