King's Fund

Regeneration and Health

A selected review of research

Edited by Jennie Popay

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Regeneration and Health:
A Selected Review of Research

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Edited by Jenny Popay
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Executive Summary

About the Review:
There is an urgent need for current and future attempts at social and economic regeneration to be informed by evidence on what works and for the new initiatives to be robustly evaluated to assess health and other outcomes. It is in this context that this review of the research literature on the relationship between regeneration initiatives and population health was commissioned by the King's Fund in London with support from the Nuffield Institute for Health.

The Aims of the Review:
- To begin to identify literature on the relationship between regeneration and health.
- To describe the approaches taken to studying this relationship.
- To attempt a preliminary assessment of the strengths and limitations of this work.
- To identify insights into how regeneration initiatives impact on health.
- To identify future challenges and directions for research.

The Structure of the Report:
The report is divided into five sections. Section 2 describes the research-based literature reviewed. Section 3 reviews the evaluative approaches adopted in this field. Section 4 describes the work identified. Section 5 considers 'what works' in regeneration from a health perspective. Section 6 presents some recommendations for future research and action.

Insights into the Impacts of Regeneration on Health:
The review has important limitations that are described in the report. Not with standing these, some prominent messages about the likely overall impact of regeneration initiatives on health – both positive and negative – and some of the pathways that appear to be associated with these impacts are identified.

Potential positive impacts include:
- *Improving physical conditions of housing improves health.*
- *Very specific and relatively minor aspects of housing improvements may have significant health benefits.*
- *The wider impact of housing improvement initiatives on neighbourhood conditions have positive health benefits*
- *Housing improvements may have a positive health effect through a reduction in poverty and debt*
- *Wider poverty reduction impacts of regeneration initiatives are also pathways to improved health.*

Potential negative effects include:
- *The process of 'decanting' residents for housing improvement work can negatively affect health status*
- *Uncertainty, delay and protracted disruption are associated with negative health impacts.*
- *Housing renewal can result in increased housing costs that may indirectly impact negatively on health.*
- *Perceived level of control may be a vital link in the causal chain connecting regeneration and health.*
- *The psychological and social pathways from poor housing to ill health are poorly understood.*

- *Regeneration initiatives may have negative impacts on the health of people living on the margins of development areas.*
- *Aspects of regeneration initiatives that do not impact on the physical environment may be relatively invisible to local people.*
- *Regeneration initiatives may increase social divisions*
- *The health impact of housing renewal may be relatively modest in the absence of wider social developments.*
- *To achieve significant health gain regeneration initiatives may need to be focused widely on social development and linked to national re-distributive policy*

Pathways to health Outcomes and Sustainability - Processes of Involvement:
The review suggests that the process of regeneration may be a critical factor in generating positive or negative outcomes of health and well-being and in the sustainability of any benefits. In particular it suggests that:

- *Perceptions of involvement are frequently that it is inadequate*
- *Research in the past has demonstrated negative impacts from the process of implementing regeneration initiatives.*
- *Maintaining and/or building a sense of belonging is crucial.*
- *Past regeneration initiatives neglected the potential for cultural discordance between lay people and professionals in relation to who should define a 'proper place to live'.*
- *Recent research provides evidence that regeneration processes continue to have a direct effect on health outcomes.*

Conclusions and Recommendations:
The review concludes with a number of key recommendations concerned with:

- Gaining, accessing and sharing information
- Agreeing what should count as evidence
- Developing evaluation methods
- Future research, particularly in relation to systematic reviews and evaluative studies of more effective ways of developing community lead re-generation.

1. Introduction

1.1 Background

There are good intuitive reasons for believing that regeneration initiatives that aim to improve social, economic and environmental conditions will lead to population health improvements. But policies and practices aiming to regenerate poor neighbourhoods must rest on more than intuition: it is vitally important that we do not take for granted positive benefits from regeneration. Research on the experience of slum clearance of the 1950s and 1960s has shown that despite the good intentions of those involved, these programmes damaged the social fabric of inner city neighbourhoods, arguably casting long shadows forward into the cities of today (see, for example, Marris 1974; English *et al.* 1976). In the introduction to his book *The Classic Slum*, for example, Robert Roberts describes how a long-time resident of Salford 'gazing over the wilderness on which still another vast slum had been razed ... spoke in grief. A kind of culture unlikely to rise again had gone in the rubble and he knew it' (Roberts, 1973). Research has also highlighted the fragmented nature of past regeneration policies, the lack of involvement of local people and the continuation of health, social and economic problems in areas and populations that have experienced successive waves of regeneration policies.

There is much that is new about today's regeneration policies. To a large extent they are trying to address the limitations of previous policies. However, there remains an urgent need for current and future attempts at social and economic regeneration to be informed by evidence on what works and for the new initiatives to be robustly evaluated to assess health and other outcomes. It is in this context that this review of the research literature on the relationship between regeneration initiatives and population health was commissioned by the King's Fund in London with support from the Nuffield Institute for Health.

1.2 Aims of the review

Our aims have been to:

- begin to identify sources of literature that directly and indirectly explore the relationship between regeneration and health
- describe the approaches taken to studying this relationship
- attempt a preliminary assessment of the strengths and limitations of this work;
- identify what, if anything, these studies tells us about 'what works' in regeneration from a health perspective
- identify future challenges and directions for research aiming to evaluate the relationship between regeneration and health.

1.3 The structure of the report

The remainder of this report is divided into five sections. Section 2 briefly describes the main sources of research-based literature that we have identified. Section 3 then critically reviews the range of approaches and methods adopted in research in this field. In Section 4 we provide brief descriptions of a selection of the work that we have identified, focusing in particular on the studies given most attention in Section 3. In Section 5 we consider what this literature tells us about what works in regeneration from a health perspective, focusing on both positive and negative health impacts and highlighting the limitations of the evidence

both positive and negative health impacts and highlighting the limitations of the evidence available. In the sixth and final section we summarise the main points arising from the literature we have reviewed and consider some of the main challenges associated with the evaluation of current and future regeneration initiatives.

2. Finding the literature

2.1 A fragmented field

Attempts to identify research looking directly at the link between regeneration and health face three main difficulties. In the first place, academic exclusivity means that relevant literature is often shaped by specific intellectual concerns. Academics from a number of disciplines such as sociology, social geography, urban and rural planning, social policy, and anthropology have explored the relationship between regeneration and health within different academic frameworks, using diverging technical language and addressing distinct audiences. In terms of accessing relevant literature, this means that it is necessary to trawl a wide range of sources. Additionally, constructing search terms to identify relevant contributions can be problematic.

Second, as in many areas, relevant literature is often hidden in publishing arenas that have limited circulation. For example, local authority housing departments and health authorities may house 'grey' literature that is difficult to identify through traditional searches. In addition, working papers or reports produced by university-based research centres may not reach a wide audience. In contrast, research reports produced by funding organisations that have a direct concern with issues relating to regeneration are easier to find, since such organisations are often anxious to publish findings to a variety of potential users through easy to access arenas such as the Internet. Methodological work within the International Cochrane Collaboration, for example, has shown that in relation to reports of effectiveness research, studies reporting positive results of interventions are more likely to be published than those reporting negative or inconclusive results. Whilst, as we discuss further below, there appears to be relatively little experimental research on the impact of regeneration initiatives, the possibility that publication bias operates in this field – whether towards positive or negative results – must be considered.

A third important difficulty associated with searching in this area arises in the context of the international literature. It is clear, for example, that the word 'regeneration' is not widely understood in North America, where the phrase 'urban renewal' is more common. Contacts with relevant experts in the field are an important source of advice and information on the ways in which regeneration initiatives are described in different countries. Similarly, whilst the notion of regeneration and of urban renewal may appear not to be relevant to many low income countries, the work undertaken for this report suggests that there may be important lessons for the richer nations to learn from the experience of initiatives aiming to promote economic and social development in some of the world's poorest countries.

2.2 Organising the search

The review conducted here was undertaken over a relatively short time frame – around six weeks of full-time research assistance. In this context, the search involved has been far from exhaustive and the work has necessarily been confined to literature published in English. We began with the results of an existing search of the main electronic databases conducted by the King's Fund library. This search aimed to identify literature focusing on the health impact of

major areas of public expenditure. The databases searched included Medline, BIDs and Social Science Citation Index. This identified only a few references to work exploring the health impact of regeneration and/or housing initiatives. We therefore devoted our time to hand searching a wide range of journals and to contacting known experts in the field in the UK and North America, including people involved in work on health and development in low-income countries. North American contacts posted messages on key Internet-based 'list servers' concerned with urban planning, including the American Sociological Association's section on community and urban society. Primary references identified were then searched for references to earlier studies. In the light of the recent review of the relationship between regeneration and health by Russell and Killoran (2000), which paid particular attention to community development approaches, this literature is also not systematically covered here.

2.3 *Sources of information*

Apart from the major electronic databases and experts in the field, a number of other useful sources of information on the relationship between regeneration and health have been identified. These are listed below and more details about each of them are included in Appendix 1.

- *The National Research Register (www.doh.gov.uk/research/index.htm)*
- *DETR web site (www.regeneration.detr.gov.uk)*
- *Local Government Association (www.lga.gov.uk)*
- *The Joseph Rowntree Foundation (www.irf.org.uk)*
- *The Chartered Institute of Housing (www.cih.org)*
- *The Economic and Social Research Council Health Variations Research Programme (Internet site to come)*
- *University-based research institutes*
- *Journals*
- *BURA – The British Urban Regeneration Association (www.bura.or.uk)*
- *Internet search engines*
- *International Literature and North American Organisations*

The journals, which were hand searched, are listed below. Given the short timeframe involved, the dates searched were determined by what was readily available and they varied across the journals.

Box 1: Journals Hand Searched

Health and Place
Journal of Urban Affairs
Space and Polity
International Journal of Urban and Regional Research
Town and Planning Review
Cities
Environment and Planning
Journal of Urban Design
Open House International
Planning and Design
Progress in Human Geography
Urban Affairs Review
Research Link
Streetwise
Built Environment
Society and Space
Regional Studies
Community Development Journal
Critical Social Policy
Social Science and Medicine
Health and Social Care in the Community
Journal of Health and Social Behaviour
Health Education Journal
Journal of European Social Policy
Sociology of Health and Illness
Housing Studies
Health-lines

3. Research approaches and methods

3.1 Factors shaping the approach to evaluation

Evaluation of regeneration initiatives raises a number of significant methodological challenges. These initiatives are usually characterised by multiple interventions, which may cover different sub-populations and/or involve the activities of different professional and non-professional groups and agencies. They usually have an extended timescale of implementation – in excess of five years – and additionally, in the UK at least, they are strongly driven by national and local political agendas. These agendas may impose tight and/or inflexible timescales and often shape the selection of the areas to target in ways that militate against experimental designs for evaluation.

All of these factors will influence, more or less directly, choices about the approach to be adopted in evaluative research. Additionally, as we have already noted, a wide range of disciplines is involved in regeneration research, each of which have their own perspectives on what should count as evidence and therefore what methods are required in order to produce robust and valid results. In this section, the general approaches currently adopted within research on the impact of regeneration are considered, a number of generic frameworks that are increasingly shaping evaluative research in this field are described, the contribution of experimental designs and participative approaches are discussed, and issues associated with measurement are considered.

3.2 Evaluating projects or initiatives

The first methodological challenge noted above – multiple interventions – produces two options in terms of what is to be evaluated:

- individual projects, or
- the initiative as a whole

To date, much of the evaluative research that has been done has involved evaluation of discrete projects within an overall regeneration programme. In particular, the literature identified in this review would suggest that the majority of studies have been concerned to evaluate the impact of housing renewal/renovation. As we discuss below, relatively little of this research has focused on health impacts, although a systematic review of this limited literature has recently been completed by staff at the MRC Social and Public Health Sciences Research Unit in Glasgow (Thomas, 2000)

The emphasis on evaluation of specific projects or single dimensions of regeneration, such as housing renewal/renovation, inevitably produces a patchwork and potentially misleading picture of 'what works' in regeneration as a whole. It is conceivable, for instance, that a positive impact of housing renewal on individual well-being could, at least in part, result from a wider process of neighbourhood renewal rather than the housing interventions *per se*. Similarly negative findings may be 'caused' by aspects of the wider regeneration process, rather than resulting directly from housing renewal. Importantly, it may be neither feasible nor appropriate to apply the results of project evaluations to decisions about multi-dimensional initiatives.

Increasingly, in the UK, there are attempts to design holistic evaluations of multi-dimensional initiatives. This is driven in part by the strong push nationally for greater integration in

initiatives such as Health Action Zones, New Deal and the programme for neighbourhood renewal. These types of policy initiatives require specific projects and pieces of work to be embedded within a broader strategic framework. In this context, to evaluate whether a regeneration initiative has achieved its aims is to look beyond single projects to consider the interaction between projects and processes. This, in turn, means that the outcomes to be measured need to be diverse. From a health perspective for instance, it requires a focus on measures of morbidity and mortality to be combined with global indicators of change within communities or neighbourhoods, such as quality of life outcome measures and measures of social well-being, relationships and social capital. There is also an increasingly strong thrust within these programmes for more participation of local residents in evaluation.

Green *et al.* (2000) provide an example of an attempt to evaluate a regeneration initiative as a whole. In the South Yorkshire coalfields, the HAZ and SRB5 are working together in an effort to improve the health and employment participation of local communities. The initiative is based on the premise that certain elements of what they term 'social capital', including 'trust, reciprocity, civic engagement and networks', are associated with better health, better qualifications, higher labour market participation and greater feelings of security. The interventions are aimed at increasing levels of social capital on the assumption that this will be associated with improving levels of health and labour market participation. A baseline survey of social capital and health status has been commissioned and the impact of interventions will be evaluated against this baseline. This evaluation also involves a longitudinal element – a rare feature of research in this field as we discuss further below. However, as we also discuss in a later section, the lack of controls in this and many other studies is an important limitation of the research identified.

The involvement of multiple agencies and groups in regeneration initiatives raises other methodological challenges. The diversity of languages and cultures within organisations and professional groups has to be addressed. If an overall evaluation of regeneration initiatives is to be achieved, it is imperative that there is agreement over definitions at all points of the evaluation process. Additionally, the co-ordination of data collection will be complex. There are particular methodological challenges if local people are to be central to the evaluation process. Much has been written about participative evaluation, but we have identified very few published examples of evaluative studies adopting this approach in the UK.

3.3 Evaluating process and outcomes

Within the methodological literature on evaluation a distinction is often drawn between evaluation of the outcomes of an intervention and/or programme and the evaluation of the process of implementing an intervention or programme. This distinction is linked, in turn, to that made between formative and summative evaluations. Formative evaluations involve study designs that focus on the process of implementing interventions/programmes and they build in regular feedback of findings to the people involved in delivering the interventions or programmes. The aim here is to improve the process of implementation and, by implication, the outcomes. Summative evaluation, in contrast, is concerned to make an overall judgement about the success or failure of an intervention and is therefore focused on the measurement of outcomes rather than processes of implementation. Whilst a single study can incorporate both elements of evaluation, regular feedback of findings is not a normal characteristic of summative evaluations – indeed, for some researchers this could result in unacceptable bias in data collection.

Two issues point to the importance of process evaluation of regeneration initiatives: the central role within contemporary regeneration initiatives of partnership working across agencies and between organisations and the populations they service; and the need to understand how these complex initiatives have an impact on health and other outcomes. Similarly, however, evaluative designs, which are able to provide robust findings on the outcomes of regeneration initiatives for individual and population health and well-being, are equally important. With respect to regeneration initiatives, it would therefore seem reasonable to assume that research on both the processes of implementation and on the impact or outcomes of the initiatives are of equal importance. The former may indeed be crucial to understanding how the latter are achieved. In general, however, the literature identified for this review suggests that few evaluative studies of regeneration are designed in a manner that can produce robust findings on outcomes. Additionally, whilst there is a focus on process evaluation, much of the work we have identified lacks methodological rigour.

3.4 Generic frameworks for process and outcome evaluative

Some commentators have argued that because of their complexity and the time periods involved, regeneration initiatives are best evaluated within an overall strategic framework (Russell and Killoran, 2000). This review has identified a number of frameworks that are being proposed as tools to assist in the strategic evaluation of regeneration initiatives.

- *Health impact assessment*

Health impact assessment (HIA) is an attempt to map out the potential positive and negative impacts on a population's health of projects, programmes or policies, and to use this mapping exercise to minimise negative health effects and maximise positive health effects. It is based on a theory of change model in which stakeholders come together at the beginning of a programme/project/policy to map out explicitly what they regard as the 'problem', the strategies they plan to adopt to address this, and the intended outcomes. Any assumptions made are identified and can therefore be challenged before implementation of any intervention. Additionally, in theory at least, the design and planning of data collection for evaluation is facilitated as the mapping exercise identifies baseline measures of both processes and outcomes. Most approaches to health impact assessment are based on a multidimensional model of health and draw evidence from a wide base – epidemiological data, professional opinion, lay perceptions, economic data, routinely collected transport data, etc. There is also increasing interest in developing these approaches to assess the health equity impact of policies: that is, an explicit focus on the potential impact of policies on health inequalities.

Developing this type of approach to evaluation within regeneration initiatives presents many challenges. At present, HIA is very undeveloped and prospective assessments are particularly rare (Macintyre and Petticrew, 1999). The evidence base upon which people embarking on HIA may draw is, as a consequence, small. This makes the task of accessing relevant information harder. The wheel must be reinvented each time. Validation of an initial health impact assessment by long-term follow up, to assess the actual impact of interventions, has also been neglected. Most projects stop at the publication of the projected health impacts. Similarly, the possibility of introducing some element of control into HIA appears not to have been considered. There appear to be a number of reasons for the limited development of HIA. The first is that the longitudinal data capture that would be required is expensive. Second, the length of time required to follow projects through to their completion and beyond is longer

than most research timeframes are able to support. Some commentators have also argued that within some professional arenas – notably the public health field and social welfare – there may be a prejudice against evaluative studies that involve the use of controls and random allocation (MacDonald, 1999; Macintyre and Petticrew, 2000). Whatever the reason, it is regrettable that the potential for more robust applications of the HIA methodology has not been developed, as this would provide a valuable source of evidence upon which to plan the next generation of regeneration initiatives.

- *Participative research frameworks*

The second type of strategic research framework identified during this review foregrounds the centrality of the participation of the people who are the focus of regeneration interventions. These frameworks/approaches have their roots in participatory research (PR), which is described by Chambers (1992) as an approach that 'hands over the stick'. Enlarging on this metaphor, Chambers (1992) identifies two particular ways in which PR differs from more traditional research approaches. First, PR involves active learning by the researchers from the people with whom they are doing research. The role of the researcher is changed from director to facilitator and catalyst (Cornwall and Jewkes, 1995). People's knowledge is considered to be valuable. They are agents rather than objects of research, capable of analysing their situation and designing solutions. Second, and closely associated with these observations, PR is argued to be reflexive, flexible and iterative (Khana, 1996). The methods and approaches adopted are intended to empower local/lay people in the research to express, investigate, present and analyse their situation. A wide range of approaches to collecting and interpreting data are encouraged, including visualisation through drawing and plays, force field analysis, mapping, etc.

Allowing people to express their opinions and values in the research process is part and parcel of the empowering approach that is deemed to be central to the purpose of PR methods (deKoning and Martin, 1996). The pedagogy of critical consciousness developed by Freire (1993) is frequently cited as an essential element of PR (Maguire, 1987). PR is seen as encouraging people to examine critically the values that operate in society, to explore these within their social context, and to move beyond these to reflect upon the power relationships and conflicts that prevent social change (Shor, 1993). However, although these ideas are frequently seen in the literature of PR, and equally frequently identified as important in practice, a recent review of PR projects suggests that the definition of empowerment is perceived rather differently by researchers in different settings (Emmel, 1997). In this review, Emmel points to the need for those seeking to implement participative approaches to research to reflect on whether the structures that exist within organisations impede PR research and whether they are willing to accept that PR will reverse the role of the teacher and learner in the research.

Several different participative research frameworks have been identified during this review. Participative Appraisal appears to be one of the most commonly used within the UK. This emerged from an approach called 'Rapid Rural Appraisal' developed in the late 1970s at the Institute of Development Studies at the University of Sussex. An example of this type of research undertaken by James (1999) on the Chingford Hall Estate in London is discussed further in Section 3.6. Appreciative Inquiry is another related approach as is the framework 'Prove It! Measuring the effect of neighbourhood renewal on local people' developed by staff at the New Economics Foundation in partnership with Groundwork (the environmental

regeneration charity). A guide to this framework is available, and it is presently being piloted by the Groundwork Trust and Barclays Site-savers, but results are not yet available.

These approaches are described by Chambers (1994) as 'a growing family of approaches and methods to enable local rural and urban people to express, enhance, share and analyse their knowledge of life and conditions, to plan and act'. They share a common focus on the need to harness the expertise of local people and the right of people to determine the shape of future initiatives aimed at social and/or economic development. Historically, these approaches have been used by aid agencies in development work in the poorest nations of the world. Increasingly, however, they are being used within regeneration initiatives in the western nations.

Selected sources of information on Participatory Appraisal and Appreciate Inquiry are shown in the box below. Other references are included at the end of this report.

Box 2: Sources of Information on Participative Research Frameworks/Approaches

Chambers R. The origins and practice of Participatory Rural Appraisal. *World Development* 1994; 22 (7): 953–69.
Centre for International Development and Training (CIDT). *Participatory Learning and Action (PLA).* Wolverhampton: University of Wolverhampton, 2000. www.ids.ac.uk
The PRA pages at CIDT: www.ids.ac.uk/pra/sources.html
The PRA Bibliography at CIDT: www.ids.ac.uk/eldis/pra/prabib.htm
Neighbourhood Initiatives: www.nif.co.uk
Intermediate Technology Publications: www.itpubs.org.uk
Information on Appreciative Inquiry: www.aradford.co.uk
Walker P, Lewis J, Lingayah F, Sommer F. *Prove It! measuring the effect of neighbourhood renewal on local people.* New Economics Foundation, 2000. Scrimshaw N S, Gleason G R, eds. *Rapid assessment procedures.* Boston: International Nutrition Foundation for Developing Countries, 1992.

- *Theory of change approach*

The third generic approach to evaluation identified during this review foregrounds more explicitly the Theory of Change approach to evaluation that was noted above as underpinning at least some models of health impact assessment. The Theory of Change approach to evaluation is explicitly informing the national evaluation of the Health Action Zones being undertaken by Ken Judge *et al.* based at the University of Glasgow. Whilst having elements in common with HIA, there are also important differences, including, for example, a very strong emphasis on formative feedback to participants in the delivery of interventions.

- *The Megapoles project approach*

The Megapoles project is described in more detail in the next section. It involves a collaboration between capital cities in the EU that are developing a range of specific small-scale initiatives, normally undertaken by the non-governmental sectors. The Socially Disadvantaged Groups Sub-Network (SDSN) involves a sub-sample of these cities, which are particularly concerned to share learning about projects that address the health needs of socially disadvantaged groups and reduce inequalities in health. At an early point in the development of SDSN, it was recognised that the lack of a standard approach to the collection, production and interpretation of data on local populations, and to the description

and evaluation of projects, made shared learning more difficult. The SDSN, therefore, commissioned two pieces of work to help in the development of consistent approaches to monitoring and evaluation. The Health in Europe's Capitals project brings together a common set of indicators comparing the health of people living in Europe's capital cities. Core indicators have been developed to measure aspects of social disadvantage and health. The second piece of work involved the development of a formalised assessment tool for evaluating projects participating in the network, based on an action learning model. More information about the Megapoles project can be found on the web site: www.megapoles.com

3.5 Experimental designs and the measurement of effectiveness

Over the past ten years, there has been a burgeoning of interest internationally in the role of experimental designs in the evaluation of health care interventions. This has been fuelled in particular by the establishment of the International Cochrane Collaboration for Evidence Based Health Care. The Cochrane Collaboration supports the production of systematic reviews of evidence from studies of effectiveness and publishes these in the Cochrane Library. Two aspects of this international initiative are particularly important to this review. First, there is the development of hierarchies of evidence that privilege randomised controlled trials (RCTs) as the 'gold standard' in terms of producing evidence of effect free from bias. There are also detailed rules for judging the quality of RCTs. Second, the Cochrane Collaboration has supported important methodological developments in the science of systematic reviews, including improvements in techniques for combining the results of different studies to increase the reliability of the estimates of effect. More recently, the International Campbell Collaboration, with its base in the USA, has been established to provide the same support and encouragement for the production of high-quality systematic reviews in the fields of education, social welfare, transport, housing, social work and the criminal justice system.

These developments have not been without their critics and there are those who argue that experimental designs in general, and the notion of randomisation in particular, are not appropriately transferred into the realm of complex social interventions such a regeneration initiatives. Importantly, however, there is a long tradition of experimental approaches to evaluation within the social policy arena, particularly in the USA. In her recent book *Experiments in Knowing*, Ann Oakley (2000) provides a fascinating account of the history of this work, noting that much of it combined outcome evaluation within an RCT context, with evaluation of the processes of implementation using a combination of methods including qualitative designs.

Increasingly, there are those who are considering ways of addressing the methodological challenges of applying RCT methodology to the evaluation of complex social interventions such as regeneration initiatives. These include, for example, randomising schools and areas to control and intervention groups to evaluate health promotion initiatives and using time as a control.

Undoubtedly, there are strong arguments to suggest that without some degree of randomisation, or at least control, in evaluative studies, we will not be able to measure 'what works' in regeneration robustly. There are also many examples where well-intentioned initiatives have been shown through evaluations including experimental designs to have the reverse effect of that intended. A recent systematic review of the 'Scared Straight' initiative in the USA is a startling example. Preliminary results from this systematic review suggest

that the intervention which exposed young men considered 'at risk' of anti-social behaviour to hardened criminals led to an increased rate of new offences committed of between 1 per cent and 30 per cent (Petrosini *et al.* 2000).

Whilst the 'Scared Straight' intervention might be considered relatively straightforward in terms of the application of RCT methodology, there are examples of complex multi-layered social interventions being subjected to controlled evaluation, if not randomisation. In her review of child accident prevention interventions for the HEA, for example, Liz Towner *et al.* (1993) described the Five City Initiative in the USA, where the evaluation had involved an innovative design including control areas. This initiative also involved the establishment of sophisticated systems for capturing routine data before the intervention was implemented, providing a strong baseline against which to measure change and impact. Getting these types of data capture systems in place was clearly time consuming (at least a year before the intervention was implemented) and may be expensive, but the results from this study suggest that the investment can be richly repaid in terms of the quality of the evidence they provide on the long-term effects of interventions.

3.6 Study designs

The research identified for this review can be broadly grouped into seven types of study designs. These groupings are briefly described below with examples of the studies that fall into each group.

- *Randomised controlled trials.* The review has identified a small number of evaluative studies that have adopted an RCT design. Generally speaking, these have focused on specific discreet aspects of regeneration initiatives such as housing improvements. An example of this type of study is the Torbay Healthy Housing Group's evaluation of The Watcombe Housing Improvement Project.

- *Before and after studies with controls.* There are a small number of studies that have sought to include a measure of control. A good example of this type of study is the Economic and Social Research Council-funded evaluation of the mental health impact of regeneration initiatives lead by Peter Huxley *et al.*, which also includes a qualitative element tapping into the subjective experience of regeneration (Huxley *et al.* 1998). The study design will allow a multi-level modelling approach to data analysis to be adopted, which will mean that the effects on health at individual and area level can be explored. It therefore has considerable potential to illuminate the health effects of regeneration and to link impact with process. However, the experience of the Huxley team also points to the considerable difficulties of identifying robust controls in this field.

- *Before and after structured surveys with limited or no controls.* Examples of a study with limited controls include those carried out by Ambrose *et al.* in Stepney, which included limited research in an area before housing renewal and a matching study with no control after renewal (1996 and 2000). The Riverside Project in Cardiff also appears to have incorporated some element of controls, but no details were available to the review team. Other studies do not include controls, for example, Green *et al.* in the South Yorkshire coalfields (2000) and in Liverpool (1998 and forthcoming final report November 2000). Survey research without controls was the most common study design identified in this review. These studies normally involve face-to-face interviews but some use postal questionnaires. Importantly, not all involve random sampling techniques. In order to

maximise sample size, some studies use quota sampling approaches, and there is an important debate to be had regarding the balance to be struck between response rates and sample size in disadvantaged areas. Some studies use separate samples at different points in time, others seek to re-interview the initial sample, and problems with mobility and sample attrition are prominent. Some of these studies incorporate a panel design, tracking a sub-set of the initial survey sample over time with repeated interviews/data collection. The longitudinal aspect of these designs means that they are able to provide valuable insight into experiences of the renewal process and to point towards possible impacts, but without control areas/groups for comparisons, the strength of the evidence on effects must be treated with caution.

Many of these studies also use focus group discussions and interviews with professionals alongside the survey instrument to explore issues in depth and provide additional background information to set the survey in context.

- *Retrospective surveys*. Examples of this approach to evaluation is the study carried out in Holly Street (Wadhams *et al.* 1996, 1998) by Hackney Borough Council. This study design is very limited as a source of evidence on the experience of regeneration initiatives because they are reliant on individual respondents' recall of experiences.

- *Participatory action research*. As already noted, this approach to evaluation is becoming more common with regeneration initiatives. However, reports of this work are most frequently found in the 'grey' literature and are therefore difficult to access. One example of this type of research, albeit not concerned with a regeneration initiative, is the Chingford Hall Estate Participatory Appraisal that focused on young people's needs and the services they wished to see developed on a North-East London estate (James, 1999). This project involved practitioners from a range of local health and social services participating in a five-day Participatory Appraisal course. They spent two days collecting data from 125 people at a variety of local venues and in a wide diversity of ways. Another example of participative research that was part of the development of a regeneration initiative is the work undertaken on the Roundshaw Housing Estate in South London in 1997 (Waddicor, undated). This was concerned to allow local people to identify needs and solutions as part of the development of an SRB bid. Neither of these studies involved the evaluation of interventions as they were implemented.

- *Qualitative research*. The studies carried out by Allen in Bradford (2000) and Ellaway in Glasgow (1999) are examples of this type of design. Whilst this approach can only point to possible effects that would require further study, it can provide particularly rich 'thick descriptions' of the process aspects of interventions and the subjective experiences of the people involved as recipients or as providers of interventions. As the Ellaway study also demonstrates, such studies can involve control groups. Similarly, as already noted, studies adopting other designs may include substantial qualitative elements such as the evaluation being undertaken by Huxley *et al.* (1999) and the work by Ambrose. (1996, 2000).

- *Systematic reviews*. Although the methodology of systematic reviews is now well developed, we have identified very few that are relevant to the field of regeneration and health. One recent example, however, which signals the growing interest in the need to identify, quality appraise and synthesise the findings from existing research, is the review of research on the relationship between housing renewal and health by Thomson *et al.*

(2000). This involved the critical appraisal and synthesis of findings from experimental and non-experimental studies of housing interventions since 1936. Seventeen primary intervention studies were identified, of which ten were prospective (including six with control groups). The remainder were retrospective, of which three used control groups. The review included qualitative and quantitative measures of health outcomes and the interventions included re-housing, refurbishment and energy efficiency measures.

3.7 Measurement of impact/outcomes

Examples of measures that have been used to assess the impacts of regeneration initiatives on communities are the General Health Questionnaire (GHQ), the Short Form 36 (SF-36) and the EuroQol. Recent research projects have also included questions taken from the Health Education Monitoring Survey and baseline survey questionnaire developed by the Social Action Research Projects in Salford and Nottingham, funded by the Health Development Agency. These questions explore lay perceptions of broader changes in neighbourhood quality and in social networks, and are drawn in turn from the survey instruments developed at the MRC Social and Public Health Sciences Unit in Glasgow.

Although standard measures have been widely used to explore the impacts on health and well-being in communities, some individual studies, such as the Shepherd's Bush Housing Association's housing project (Barnes, 2000), have developed new measures to reflect relevant concerns to the study area. Some studies have also highlighted the need to generate qualitative measures. For example, as already noted, Huxley *et al.* (Huxley, 1998), in their study of the impact on mental health of an urban regeneration initiative, are collecting narrative accounts of the experience of regeneration in in-depth interviews. These will enable 'thick' descriptions of perceived changes within communities or neighbourhoods, which will illuminate the way in which the impacts of initiatives are experienced and assessed by local people.

Having discussed some of the many methodological issues arising from research into the health effects of regeneration, the next section provides short descriptions of a selection of the studies included in this review. Then, in Section 5, we attempt to identify the main messages from this body of research about the health impacts of regeneration initiatives.

4. A Selection of the studies included in the review

This is not a complete listing of the studies that have been identified in this review nor of those that have informed the next section of this report on the key messages from the literature on 'what works' in regeneration and health. Time constraints on the review have necessarily limited the amount of detailed recording work that could be done for this section. The section is divided into two parts. The first include a selection of UK projects that have been identified. The second provides information on programmes of work and/or projects from other countries. Despite the reservations, these have a valuable contribution to make to understanding about effective and appropriate ways to evaluate the health impact of regeneration initiatives and to the evidence base on what works in this field.

4.1 UK studies

- *The Torbay Healthy Housing Group's Watcombe Housing Improvement Project (Contact: Meryl Basham, Research and Development Support Unit, University of Plymouth.* Meryl.basham@sdevonhc-tr.swest.nhs.uk *).* This is a randomised control trial of the effects of housing improvements on the indoor environment, the health status of household residents and the costs to the NHS. An initial baseline survey was conducted funded by a local project grant, and the NHS Executive Southwest is funding the subsequent research. The baseline was undertaken between 1995–98 and the intervention study began in April 1999. The unit of randomisation is the house, and the study area includes 127 houses and 509 residents. The intervention involves major improvements to the houses in terms of energy efficiency, ventilation systems and electrical works. The intervention is being introduced in two phases with the second phase houses acting as controls. Outcome measures include changes to the indoor environment including measures of damp, house-dust mite, temperature, humidity, carbon monoxide and nitrogen oxide levels, and mould spores. Using 'before and after' questionnaires, experiences of ill health, especially respiratory problems, quality of life, and expenditure on heating and controlling damp, will be recorded. Respondents with respiratory problems will also be tested for lung function and be asked to keep a diary for a week to record respiratory symptoms. Results from the evaluation should be available early in 2002.

- *The Riverside Project in Cardiff (Contact: Ben Rolfe, Department of Epidemiology and Public Health, University of Wales College).* This involves a longitudinal study of the impacts on health of housing renovation work as a part of an Urban Renewal Area scheme. The study began in 1996. Information has been collected to monitor dampness, and indoor temperature and moulds, and on self-perceived changes to health status using the SF-36. Changes in symptoms are also being monitored on a sub-sample of vulnerable residents with particular chronic health problems including asthma and osteoarthritis. Additionally, there is a focus on children under five, with data on indoor accidents, minor illnesses and allergic responses being collected. Residents in houses subject to renovation have been interviewed one year before renovation, shortly before work is due to start and six months after the work is complete.

  The study has recently been extended to assess the impact of renewal on residents' perceptions of the area, their psychosocial status and on community demography.

This aspect of the work involves a cross-sectional postal survey using a variety of area-based health and well-being survey instruments and the GHQ-12. This will be followed up by qualitative interviews with a smaller number of key informants. The research team includes academics from a wide variety of disciplines, and the impacts on health will be assessed from both an individual disease-oriented perspective and a community perspective utilising a broader notion of well-being.

- *Limehouse Fields and Ocean Estates Study (Ambrose, 1996, 2000).* Undertaken by the Centre for Urban and Regional Research at the University of Sussex and at the Health and Social Policy Research Centre at the University of Brighton, this study is part of a larger Health and Community Development Programme in the East London and City Health Authority area. Refurbishment of some housing, and demolition and rebuilding of other council housing, took place on these estates as part of the SRB Regeneration Programme in Central Stepney between 1995/96 and 2000. The methodology chosen for the evaluation was a before and after 'sequential' survey. A random sample of 107 households (11.5 per cent sample) was selected, and the baseline data collection involved each household receiving several visits over a five-month period (Nov 95–March 96). A survey of providers working in services related to housing, health, education, law, social work and the emergency services was also conducted. Qualitative in-depth interviews were conducted with a sub-set of the survey sample and detailed observational notes were recorded. The area comprised a large Bangladeshi population (69 per cent Bangladeshi) so interviewers worked in pairs, one being a Sylheti speaker.

  Self-evaluated health measures were chosen. On each visit respondents were asked about each episode of ill health and the total number of illness days since the last visit – visits were at approximately six-week intervals. The severity and duration of symptoms were recorded. Follow-up research was conducted after a four-year interval. Fifty of the original 107 households were interviewed at this stage.

  This study found a marked reduction in the duration and severity of illness episodes reported, and fewer consultations to health professionals. The number of illness days fell by 700% between the two surveys. However, the overall conclusion of the researchers is salutary: whilst there were health gains overall in the borough of Tower Hamlets, health is not improving (as measured in population indicators of health) and there do not seem to be spill-over effects from the SRB into other areas. In addition, local residents still live in poverty

- *Inverclyde Housing Investment Study (Ellaway et al. 1999).* This work was conducted by staff at the MRC's Social and Public Health Sciences Unit at the University of Glasgow. They were commissioned by the Inverclyde Regeneration Partnership to assess the impact of housing investment on health improvement (Ellaway et al, 1999). This was a small-scale cross-sectional study focusing on the health of households in four regeneration areas, two of which had comprehensive housing improvements and two of which had been largely unimproved. It also involved the collection of qualitative data. Interviews were conducted with 28 tenants in their own homes, with housing and health professionals, and with groups of people in tenant associations and

community groups. Respondents were asked to reflect on their housing and health experiences.

The study revealed that local people reported a close association between housing conditions and health. Those who were living in unimproved housing reported high levels of asthma, with a number of mothers feeling 'run down' as a result of their children's ill heath. There were reports of high tranquilliser use by mothers coping with poor living conditions, high levels of anxiety and depression, high levels of smoking, frequent consultations with health professionals and 'fuel poverty' (debt associated with heating energy inefficient homes). These experiences were backed up by high prescription rates for drugs to treat asthma and depression. Tenants who lived in areas of housing investment reported improvements in their health in all the above areas.

In terms of causality, the results of this study suggest that health improvements were due to both the physical improvements to the buildings as well as to improvements in security and the overall attractiveness of the area. The research also pointed to health impacts associated with the process of conducting improvements. The experience of being 'decanted' to other accommodation while improvements were taken place was extremely stressful in a number of ways. On the other hand, tenants felt that their involvement in the design process produced better housing and that it enhanced their self-confidence and self-worth.

- *The Shepherd's Bush Housing Association Study (Contact: Paul Doe, Chief Executive, Shepherd's Bush Housing Association).* This study, conducted by the housing association is concerned to evaluate the impact on health of the association's reinvestment and refurbishment programme. The study design is longitudinal and involves controls. The research has been largely funded by the Housing Corporation's Innovation and Good Practice Grant. It is a four-year study, and the first period of data collection has recently been completed. The intervention group consists of two sub-groups: existing tenants whose houses are due for renovation and new tenants who will move straight into renovated properties. The control group includes tenants whose homes are likely to be unchanged. The survey instrument includes the EuroQol EQ5D and the SF-36 to measure changes in self-perceived health status. Some open questions are included to enable qualitative data to be collected. Tenants are being interviewed before renovations take place and at six-month intervals thereafter in order to track change. Questionnaires are being administered face-to-face by the housing association's staff.

  Preliminary results have been analysed, which suggest that there are improvements in health and in feelings about the neighbourhood amongst the intervention group. Despite being cautious about the robustness of the early findings, the housing association has used the research to identify components of refurbishment that appear to offer the best health improvements.

- *Holly Street Regeneration (Wadhams et al. 1996; Wadhams, 1998).* Holly Street was a system built estate in Hackney, completed in 1971, which was almost completely demolished as part of Hackney's Comprehensive Estates Initiative at a cost of over £100 million pounds. In its original state it was plagued with problems (infestations of

cockroaches, ants and vermin, damp and cold, crime, vandalism and squatters). The housing renewal has worked on two fronts: the first, a physical renewal to restore the neighbourhoods original street patterns with small blocks of flats and brick built houses; the second, a comprehensive programme of community development and local economic opportunities. There has been a strong emphasis on involving the community in joint management of the housing association, and residents are taking responsibility for the management and maintenance of the new community buildings.

Two surveys have been commissioned to evaluate the impact of the housing renewal on individual health and community well-being. The first 'Just What the Doctor Ordered' (Wadhams *et al.* 1996) was a cross-sectional survey intended to assess the benefits of the scheme in terms of physical and mental well-being, crime, and leisure and educational facilities. It was methodologically problematic, as it was a retrospective survey that asked respondents to compare their current situation with how they remembered it to be one year previously. This will have affected some measures (e.g. health service usage) more than others (presence or absence of infestation).

Enormous physical improvements were recorded (cockroach infestation reduced from 76 per cent to 3 per cent). There were also dramatic changes in perceptions of personal safety and experience of crime (reductions from 44 per cent to 2 per cent of those reporting having seen a violent incident; 40 per cent to 1 per cent having experienced a burglary; 60 per cent to 16 per cent considering the neighbourhood to be dangerous). Information on the use of health services information should be considered unreliable for the reasons mentioned above. However, this suggests that the tenants' demands on the NHS services had fallen since re-housing.

The second report 'Upwardly Mobile' (Wadhams, 1998) was again based on a cross-sectional survey focused on 'the factors that promote sustainability in major programmes of housing investment'. This survey sought to measure progress in the new Holly Street neighbourhood towards attaining sustainability. The report recorded high levels of feelings of personal safety and community safety, low levels of neighbourhood nuisance, a 'picture of optimism' and 'a genuinely low stress neighbourhood'.

- *The effects of housing improvements – a systematic review of interventions studies. (Thomson H, Petticrew M, Morrison D. B.M.J. Forthcoming, 2001).* . The objective of this work was to systematically review the effectiveness of housing improvement interventions in improving health. The studies including in the review are described in an earlier section. The reviewers concluded that many of the 17 reviewed reported health gains following the interventions, which included re-housing, refurbishment and energy conservation measures, in terms of reduced illness episodes and improved mental health. However, they suggest that small study populations and the lack of controls limit the generalisability of these findings. They conclude that linking housing to health requires a holistic approach to evaluation that recognises the multi-factorial and complex nature of poor housing and deprivation. They call for larger scale evaluative studies in the future which investigate the wider social context of housing interventions.
- *The Impact of Urban Regeneration on Mental Health (Contact: Professor Peter Huxley, Institute of Psychiatry, London. 0207 612 6874. This on-going research is funded within the Economic and Social Research Council Health Variations*

Programme. More details are available at: www.lancs.ac.uk /users/apsocsi/hvp/phase 2). This study has three aims. First, it seeks to achieve a better understanding of the role played by regeneration in altering the degree and distribution of socio-economic variations in mental health. Second, it seeks to understand the impact of socio-economic changes on people with differential vulnerability to the development of common mental health illnesses. Third, it aims to better understand the measurement of subjective well-being in urban settings and which factors contribute to its improvement or maintenance during socio-economic change. The study design involves an intervention and a 'matched' control area with no targeted regeneration intervention planned at the time the study began in November 1998.

In both areas, the study will involve a postal survey of 8000 people to collect information on mental health status, quality of life, personal circumstances and consulting behaviour. This survey is to be repeated after 12 months and involves a random sample of residents drawn from the electoral register. Two groups of 200 people drawn from the survey sample will be followed up with a series of in-depth interviews that will include structured measures of quality of life and clinical problems, as well as open questions. These respondents are to be interviewed at two points in time over a 12-month period. One of these groups will consist of respondents 'vulnerable' to mental health problems on the basis of marital status, employment status, etc. The second group will include 'less vulnerable' people: married adults, employed people, etc. Additionally, consultation rates in primary care are to be monitored and the team plan to develop methods for capturing social and economic changes brought about by the regeneration.

4.2 *International material*

- *The Rockefeller Foundation Programmes (www.rockfound.org).* Although not a specific evaluative study, this programme may provide useful contextual material for thinking about how the health impacts of regeneration initiatives might best be evaluated. It is also important to recognise that there are real difficulties in interpreting evidence on the effects of social interventions that have been implemented in very different political, economic and organisational settings. However, that said, with due caution lessons can be learnt from the international literature. The Rockefeller Foundation runs two programmes that may of particular interest to British policy-makers and researchers.

  The *Working Communities programme* focuses on increasing employment and vocational skills as a means to creating participative communities. The programme aims 'to transform peer urban neighbourhoods into working communities – safe healthy, and effective neighbourhoods – by increasing employment rates, improving all urban schools, and enhancing participation of people who are poor and excluded in a democratic society'. In particular, within a sub-theme that focuses on building competent organisations, there is a joint programme of work entitled 'California works for Better Health' with the California Endowment to develop sustainable strategies aimed at creating jobs and improving health. In addition, work with the Corporation for Supportive Housing into employment strategies run from supportive housing corporations is backed up by strong research evidence that could be assessed for its impact on health and its transferability to a British context.

  The *Health Equity programme* includes an objective to design 'health equity monitoring surveillance systems' to both evaluate health and other social policies and

to influence decision-making on implementing equity-enhancing strategies and interventions.

- *The US Department of Housing and Urban Development's Office of Policy Development and Research (www.huduser.org)*. This is another potentially fruitful source of international evidence. Although they appear not to have explored the impact on health of urban developments, their function is to support the Department's goal to encourage the development of 'cohesive and economically healthy communities' and could potentially support research that could be shared with users in Britain.

- *Project Megapoles – Socially Disadvantaged Groups Sub-Network – SDSN (www.megapoles.com)*. The Megapoles project was set up in 1997 with support from the European Commission DGV. It involves locally elected majors and representatives from 14 Metropolitan capitals – Amsterdam, Athens, Berlin, Brussels, Copenhagen, Dublin, Helsinki, Lazio-Rome, Lisbon, London, Madrid, Oslo, Stockholm and Vienna – together with observers from Ile-de-France and Luxembourg. Lyon is also a participant. The overall aim of the project is to develop effective means of achieving better health and reducing inequalities amongst socially disadvantaged groups, children and young families and older people. The Socially Disadvantaged Groups Sub-Network involves a subset of the participating cities. The aim is to exchange experience, information, knowledge and best practice, with a particular emphasis on practical support at community level.

  The SDSN has supported two types of work. First, work developing consistent approaches to data collection and analysis and to the evaluation of individual projects, and second, city-based innovative projects to address the health needs of socially disadvantaged groups (Cameron and Cranfield, 1997).

- *Low-income countries studies*. Work that has been conducted with and on low-income countries also appears to offer useful insights for the design of regeneration initiatives in the UK and for their evaluation. There has been, for instance, on-going debate about the reason why mortality rates have declined in both developed and less developed countries, despite global economic crises, wars and natural disasters (Murray and Chen, 1993). Differences in mortality rates between low-income countries suggest that investment in social policies that produce health-enhancing assets, such as ensuring that women have access to education, are likely to result in better health for those populations.

  An example of the potential health improvement impact of macro social development initiatives that promote greater equity is the Indian state of Kerala (Lynch *et al.* 2000; Kabir and Krishnan, 1996). Here, mortality rates approach those of much wealthier, industrialised countries, despite relatively low per-capita income. The difference between Kerala and other states of India appears to be the equitable nature of resources – Kerala having more redistributive policies and decades of public investment in human resources, particularly in promoting gender equality and improving education. The learning potential from these debates is in guiding decisions about the health-enhancing contributions of regeneration initiatives.

5. What works? – The evidence of how regeneration activity affects health

5.1 The context: acknowledging complexity

Although there is a vast literature that supports the link between poverty and social exclusion on health, there is relatively little evidence on whether area-based regeneration initiatives intended to reduce poverty and improve living conditions impact positively on health and, if they do, how this impact is produced. One reason for this is that there are many interacting factors that act together to impact on health, and disentangling these in evaluative research design is not simple. However, there are also severe limitations with the dominant designs utilised in current evaluative research. As we have noted, few longitudinal studies incorporating controls, which could help to establish causal mechanisms, have been carried out, and of those that have most are still in progress. Even fewer studies involve randomised allocation to an intervention group – an aspect of research design that would be required for causality to be established robustly. The long follow-- up times that would be required make such studies expensive and prone to sample size attrition due to losses in follow-up. This latter problem is exacerbated by the nature of regeneration initiatives, which in the past at least have involved large-scale movements of populations as housing stock is renewed or renovated. Another problem is that systematic reviews of the findings from the limited research that has been done are also rare. Here, there is a particular need to consider the insight remaining to be gleaned from the body of evaluative research conducted during the 1960s and 1970s during early waves of housing/urban renewal.

There are also considerable 'political' difficulties associated with the notion of random allocation of areas for regeneration initiatives. The choice of areas for such initiatives is frequently made on the basis of local political expediency, for example, a process that precludes rational debate about choices. As noted above, some commentators have argued that these difficulties are not confined to local or national politicians and/or policy-makers, but are also apparent within disciplines and professions in the public health/regeneration fields (Macintyre and Patrice, 2000; MacDonald, 1999). There have certainly been experimental studies of complex social interventions that undermine the arguments put forward by some that this is simply not feasible. In their review of social experiments, for example, Berk *et al.* reference Randomised Controlled Trials of the effects of prison rehabilitation programmes, of welfare to work initiatives, and of television programmes such as Sesame Street (Berk *et al.* 1985).

In general, then, it would appear that a major area of public investment, which is the focus of substantial local activity and the cause of significant disruption in disadvantaged communities, rests on a strong belief combined with intuition that it must have positive effects on health and well-being and the best of intentions, rather than on sound evidence. In the time available, it has not been possible to undertake an exhaustive search for evaluative studies of the health impact of regeneration initiatives, nor to review systematically the findings of all of the studies that have been identified. It is possible, however, to distil from the body of work that has been identified, some prominent messages about the likely overall impact of regeneration initiatives on health – both positive and negative – and to point to some of the pathways that appear to be associated with these impacts. However, definite answers about the impact of regeneration on population health requires a more systematic review and appraisal of existing research than has been possible here. Additionally, there is a need for more innovative approaches to experimental evaluation of regeneration initiatives in the future.

5.2 *Evidence for positive health impacts*

- *Improving physical conditions of housing improves health.* There have been a number of reviews of the evidence for the negative health impacts of poor housing conditions (see, for example, Ambrose, 1996; Ineichen, 1993; Burr *et al.* 1998; Bruneekreef *et al.* 1989; Strachan *et al.* 1989; Platt *et al.* 1989; Hyndman *et al.* 1990; Williamson *et al.* 1997). This work provides strong evidence linking poor physical housing conditions – including damp, cold, overcrowded and infested accommodation – with ill health. It is not surprising, then, that several studies have reported reductions in self-reported episodes of ill health and in use of services following housing improvements. Studies have also reported improvements in health-related behaviour, such as reduced smoking rates, improved diets and more positive attitudes towards life in general, as well as more participation in community activities. Respondents were reported to have linked these improvements directly to the improved physical condition of their homes, as well as other factors (see below). These findings have also been supported by changes in prescription rates for depression and asthma-related drugs (see, for example, Ambrose, 2000; Ellaway, et al 1999). A recent systematic review of the impact of housing renewal/renovation on health has also been completed (Thomson *et al.* 2001). This review highlights the positive findings discussed above, but also argues that small sample size limits the generalisability of these results. They also point to the need for a more holistic approach to evaluation in the housing field.

- *Very specific and relatively minor aspects of housing improvements may have significant health benefits.* In the Shepherd's Bush Housing Association study (see contact details in Section 4), researchers found that the provision of central heating and security measures were most strongly associated with reported improvements in health. New decorations were also linked to improvements in depression and psychological problems.

- *The wider impact of housing improvement initiatives on neighbourhood conditions have positive health benefits.* Housing investment is not simply about improving the physical structure of buildings but about revitalising social space by improving the opportunities for social interaction and integration (Turok *et al.* 1999). These initiatives can also provide communities with improved access to nearby city or town environments; improve access to services and leisure; and create safer, more attractive environments. Findings from several studies suggest that health improvements resulted as much from these wider changes as directly from housing improvements.

- *Housing improvements may have a positive health effect through a reduction in poverty and debt.* Some studies have found that positive health benefits are linked to those elements of housing improvements that lead to the eradication of the causes of debt, such as the building more energy-efficient homes (Ellaway *et al.* 1999).

- *Wider poverty reduction impacts of regeneration initiatives are also pathways to improved health.* Studies have pointed to several poverty reduction/income maximisation projects within overall regeneration initiatives that are associated with improved health. For example, the provision of access to skills training and employment may lead to increased household income and improved self-reported health. Similarly, a study initiated by Liverpool City Health Plan (Abbott and Hobby,

1999) of a welfare advice project based in a primary health care setting reported these types of impacts. Despite poor participation rates (n=80) and an attrition of half the participants at 12 months, the results showed statistically significant improvements in three health-related Quality of Life indicators in the SF-36 questionnaire. There was also a statistically significant difference in the changes in these indicators compared to those not receiving an income rise.

5.3. *Evidence for negative health impacts*

- *The process of 'decanting' residents for housing improvement work can negatively affect health status.* Several studies have pointed to the negative impact on health and social relationships of the disruption caused by the enforced re-housing – in some instances temporary in others permanent (see, for example, Ellaway et al , 1999; Green *et al.* 1998). In Ellaway's study, residents often described this period as 'a nightmare'. Alternative accommodation was often extremely poor – the ceiling collapsed in one temporary home – was felt to be situated in unsafe areas, and few efforts were made by housing officials to respond to problems. The decanting process can be particularly stressful for elderly residents. In Green's study, for example, residents did not want to be left isolated in largely empty blocks while they waited for suitable alternative accommodation. Preliminary results from this study suggest that there is an association between residents' levels of stress or worry about the process and their mental health, as recorded on the SF-36.

- *Uncertainty, delay and protracted disruption are associated with negative health impacts.* Studies point not only to the negative impact of being re-housed, but also to the importance of communication systems and information provision aimed at lowering uncertainty In the study of residents in four Liverpool locations, Green *et al.* (1998) reported that up to 35 per cent of the residents in one area were stressed by the renewal process and 58 per cent said the process was taking too long and the uncertainty was affecting their health. Similarly, in a small-scale qualitative study of the experience of housing renewal on a Bradford estate (Allen, 2000), some residents reported that anticipation of the process made them feel ill and nervous.

- *Housing renewal can result in increased housing costs that may indirectly impact negatively on health.* Ambrose (2000) reports anecdotal evidence to suggest that unforeseen rises in the cost of living in new housing may be causing stress. Some families that have been re-housed in new homes after the demolition of their previous accommodation in the Limehouse Fields and Ocean Estates area of Tower Hamlets now have water meters (mandatory in newly built houses), raised council taxes and rent rises as management has transferred from the local authority to other social landlords. Ellaway *et al.* (1999) also reported unforeseen costs to residents due to housing renovation.

- *Perceived level of control may be a vital link in the causal chain connecting regeneration and health.* Some studies strongly suggest that perceived levels of individual control significantly influence the experience of the housing renewal (Allen, 2000). However, the pace of implementation around regeneration initiatives can make it difficult to provide genuine opportunities for people to exercise individual or collective control over the process.

- *The psychological and social pathways from poor housing to ill health are poorly understood.* It is now widely accepted that improving housing conditions will in some measure improve the health of residents. However, there is still much to learn about the mechanisms linking housing conditions to health outcomes. The mechanisms linking physical aspects of housing conditions to respiratory problems, for instance, or other specific diseases, are better understood than the psychosocial pathways linking housing conditions to other physical, psychological and emotional health outcomes. In addition, it is acknowledged that the relationship may act in both directions, i.e. housing may affect the health of residents but health also affects housing choices (Ambrose, 1996).

- *Regeneration initiatives may have negative impacts on the health of people living on the margins of development areas.* People living in areas just outside the regeneration initiative may be disadvantaged and have to watch while others receive the benefit of large public spending. Anecdotal evidence from the interviews with service providers in the Limehouse Fields and Ocean Estates Study (Ambrose, 2000) recorded that levels of stress and depression in this group of people had been greatly exacerbated by their experience of being left out.

- *Aspects of regeneration initiatives that do not impact on the physical environment may be relatively invisible to local people.* A study of local attitudes in four regeneration areas highlighted the frequent lack of communication in highlighting initiatives that had been implemented in their area (Forrest and Kearns, 1999). Whereas physical improvements within localities were highly visible, there was a general lack of awareness of social and economic regeneration initiatives in areas such as training, employment, crime prevention and leisure.

- *Regeneration initiatives may increase social divisions.* Research suggests that social divisions within neighbourhoods may be created or exacerbated by regeneration. Forrest and Kearn's (1999) overview of regeneration initiatives identified instances where areas had become divided by regeneration. For instance, in the Trowbridge Estate in Hackney (Cattell and Evans, 1999) residents were divided as to the fate of the 1960s properties. This has resulted in an estate that is physically and socially divided, with gates and a brick wall dividing the old and new homes. New housing allocation strategies resulting from regeneration were also found to create division. In St Hilda's in Middlesbrough (Silburn *et al.* 1999), the development of a private housing area called Tower Green resulted in 60 per cent of houses being sold to owner occupiers – though many of these were taken up by private landlords – and 40 per cent were sold to a housing association. These properties were unpopular because they were small, were relatively expensive to rent, tenants faced harassment from people living in other parts of St Hilda's, and the housing association was seen as letting properties to people considered to be 'undesirable'. Indeed, there is a general perception that the area went downhill after the arrival of 'strangers' into the neighbourhood.

5.4 *The limits of the health impacts of housing renewal and regeneration*

- *The health impact of housing renewal may be relatively modest in the absence of wider social developments.* A study by Hopton and Hunt (1996) in Scotland, which looked at the impact of an improved heating system on the symptoms of children living on a peripheral housing estate, found that the elimination of dampness/mould only prevented a further deterioration in health rather than an expected improvement. The authors suggest that isolated improvements to housing alone are unlikely to be sufficient to improve health in areas of multiple disadvantage. Poverty and other housing problems were likely to be overriding the health benefits to be gained from the heating. The need for housing developments to be evaluated within a wider context was also highlighted by Thomson *et al.* (2000) in their recent systematic review of housing intervention studies.

- *To achieve significant health gain regeneration initiatives may need to be focused widely on social development and linked to national re-distributive policy.* Health gains were clearly achieved through the renewal initiatives in the Limehouse Fields and Ocean Estates area of Tower Hamlets (Ambrose, 2000) and the Inverclyde initiative (Ellaway, *et al* 1999). However, overall, these authors conclude that area-based regeneration initiatives have only limited potential to improve health, limited in that the root causes of health inequalities (poverty) are not addressed and in that the impacts seen within the renewal area are not seen outside.

5.5 *Health impacts, lay involvement and the implementation process*

The above section has pointed to some of the possible ways in which housing renewal and regeneration initiatives may affect health – positively and/or negatively. Running through the findings of the research reviewed there has been a narrative about the critical role of the processes involved in the implementation of renewal and/or regeneration initiatives. In particular, there is evidence from both recent and older research that the way in which local people are involved in the process of change is of crucial importance to the direction and scale of health impact (Chatterton and Bradley, 2000).

- *Perceptions of involvement are frequently that it is inadequate.* A review of four areas that had been the target of successive waves of regeneration was funded by the Joseph Rowntree Foundation (Forrest and Kearns, 1999). The main focus of this review was on local people's responses to developments in their area. On the whole, people felt that they were not involved as full partners in the regeneration process and that the process was merely the professionalisation of their neighbourhood's social problems. In addition to the lack of power in decision-making, they also felt that there was a general lack of understanding of the histories of communities themselves. The researchers argue that an understanding of the history, structure and social relations of a community is essential in order to generate an understanding of internal differences and tensions within communities. This, in turn, they suggest, would help to prevent inappropriate actions and suggest more widely acceptable ways forward for regeneration initiatives.

- *Research in the past has demonstrated negative impacts from the process of implementing regeneration initiatives.* The lack of consultation with residents was characteristic of the major slum clearance schemes of the 1940s, '50s and '60s. There is a large body of

research exploring the impact of these initiatives on the people displaced. These classic studies, briefly described below, have much to tell today's 'regeneration' professionals.

- *The importance of maintaining and/or building a sense of belonging.* Studies from the Centre for Community Studies in Massachusetts highlight the salience of people's history with specific places and the need for regeneration initiatives to develop ways of building on this. The focus was a long-term study of the psychosocial effects of a redevelopment in the west end of Boston. A number of studies have been published describing the effects that displacement had on its residents. Herbert Gans' book *The Urban Villagers* (1962) provides a seminal text on their experiences. In relation to this review, however, the research led by Marc Fried (1963) is particularly relevant. It described the responses of large numbers of people interviewed for the study as closely associated with the expressions of grief. About half the 350 women and 316 men in the study demonstrated severe grief responses after six months. Even after two years a quarter of the women in the study, and only slightly fewer men, report sadness or depression in response to relocation. Gans argues that relocation failed to take into consideration the extent to which places (particularly for more deprived sections of the population) can provide a deep sense of continuity in people's lives. Relocation deprived people both of their past and a sense of the future. Similar findings were forthcoming from studies of major slum clearance initiatives in the UK during the late 1960s and early 1970s (see, for example, English *et al.* 1976).

- *Cultural discordance – who should define a proper place to live?* The work of Peter Marris (1974) in Lagos described the relocation of inner-city dwellers to newly built residential neighbourhoods away from the centre of the city. He describes in depth the disastrous relocation strategy that failed to account for deeply ingrained social rituals and cultural norms around places for which the design of the streets of central Lagos, for all its acknowledged problems, were an expression. The new, tidy estates were built on the model of British suburban estates that provided for the traditional British middle-class nuclear family, with its concern for autonomy and privacy, and British working patterns. Such a setting for its intended residents, however, was completely at odds with existing kinship patterns and employment practices, despite the emergence of the middle class, distanced from traditional values and rituals.

  A central argument that Marris makes is that it is a mistake to think that social engineering is possible by physical means. The director of the Lagos project was an engineer by training, the significance of which was not lost on Marris. Although the regeneration projects of today are not as crudely conducted as the ones above, and few building projects seek to relocate residents to completely new surroundings, there are still relevant lessons to be learnt. Marris is critical of the way in which 'society hands its most intractable problems to professional administrators, who accept the ideals which underlie their assignment, but are neither trained not required to search out the social implications.' He argues that planners and residents view their neighbourhoods through different lenses and each attaches meanings to them that the other fails to understand. What such research indicates is the importance of neighbourhoods as areas that have historical social significance to the people who live there. If a park, or pub, or post office, or bank or church is closed or transformed into something else, this could have a wide range of implications for the people who have used them.

The notion of 'normative landscape' and the health salience of lay narratives about 'proper places' in which to live is also discussed in a paper by Popay *et al.* (2001) based on data from their Economic and Social Research Council funded study of lay knowledge and health inequalities in four areas in north-west England.

- *Recent research provides evidence that regeneration processes continue to have a direct effect on health outcomes.* More recent research continues to suggest that the way in which renewal and regeneration initiatives are implemented has a direct impact on health. For instance, on the basis of his study in Paddington, Peter Ambrose argues that control over the process of change had an impact on alleviating stress (Ambrose, 1996). In his later Tower Hamlets study, Ambrose (2000) reports that, despite the experience of the upheaval of moving, the sense of belonging and of feelings of connectedness with the local community strengthened in the study population. He attributes this to the great efforts made to involve local residents in the SRB programme. In contrast, Allen (2000) reports that for some tenants on a local authority estate in Bradford, the experience of housing renewal was 'stressful and damaging'. He suggests that this may have occurred because full understanding of how the housing renewal process affects different individuals was not understood or taken into account.

  Holly Street in Hackney is often quoted as an example of the success of involving the community. Throughout the project there has been a strong emphasis on involving the community in joint management of the housing association, and residents are taking responsibility for the management and maintenance of the new community buildings. This has been rewarded with a neighbourhood regarded by its residents as 'low stress', safe and one where before most of the residents wanted to move out, now, in contrast, the majority see Holly Street as where they want to be for the foreseeable future.

5.6 Involvement in the research process

Research also points to positive benefits of involving local people in the evaluation of regeneration initiatives. But there are also problems to be overcome. Some studies, for example, suggest that where communities are seen as homogeneous, local partnerships were more likely to be dominated by a particular viewpoint held by a particular group of residents (Anastacio *et al.* 2000; Forrest and Kearns, 1999). Case studies show that, in many instances, community representatives were not known to the majority of local residents and that they did not communicate information about developments within their area. Residents also felt that agendas were pre-set and that their views were only valued if they fitted in with the priorities of the local council or of private sector interests.

There have also been difficulties in involving particular sections of communities, for example young people and people from minority ethnic groups (Anastacio *et al.* 2000; Fitzpatrick *et al.* 1998) whose views are often excluded or not sought. Sometimes historic institutional traditions of conducting business are not familiar to local people for whom bureaucratic agendas, with their painstaking attention to detail and internal jargon, are alien and irrelevant to the issues that concern them. The Nottingham Partnership (Silburn *et al.* 1999) illustrates the problem of involving people without developing appropriate structures to accommodate lay and professional contributions. The experience in this case was that fewer and fewer people attended forum meetings.

The development of appropriate audit tools to assess the effectiveness of participation is a possible way forward. One such tool has been developed by researchers at Goldsmiths College in the University of London (Anastacio *et al.* 2000; Burns and Taylor, 2000). This

provides a method for local people to map the context for participation, the quality of participation structures, the capacity of partners of communities to participate, and the overall impact of participation.

There is an equally important challenge, however, arising from the need to develop research processes that are also underpinned by the principles of participation and partnership with local people. It has been argued that an inclusive strategy for regeneration requires in-depth knowledge of the area (Brownhill and Darke, 1999). In this context, local people would be valuable contributors to the collection of local data and the design of questionnaires that are relevant to their concerns. As we have described above, there is increasing use of participatory research approaches, and some projects have made limited attempts to develop a participative approach to evaluation. For example, Ambrose used teams of two interviewers, one being from the local area. This method was used partly because of the language barrier and partly to encourage the trust of the respondents. In other regeneration projects local research is integral to the development of an effective regeneration strategy. The handbook *Prove It!* referred to earlier (Walker *et al.* 2000), written by staff at the New Economics Foundation, is specifically designed to guide local people in participating in research and the evaluation of regeneration projects they are involved in. The Joseph Rowntree Foundation has also funded research to explore inclusive strategies for urban regeneration that include an overview of participatory research methods. In their report on this work Brownille and Darke (1999) describe a variety of ways in which people can, and have been, involved in defining local problems and conducting research. Some of these approaches have already been noted in earlier sections and they include:

- The involvement of women's groups and minority ethnic organisations in collecting information relating to the locality. An example was given of an Asian women's centre that received funding to train young people in community research skills. All trainees received payment and a certificate for the skills they had learnt in the process of conducting research into the problems of unemployment and low achievement amongst young local Bangladeshi people. The local authority now uses people from the centre in research, addressing a wide range of issues to build up a rich picture of the local area. In turn, the centre can communicate findings to local people both in their own language and in a way that resonates with issues they face in their own lives.

- Participatory rapid appraisal (PRA) is a way of enabling local groups to define and communicate their own needs to developers. This involves working with small groups of local people who, as much as possible, reflect the diversity of the local population. They are then given limited training in the use of various tools for collecting information, such as diagrams, group discussions, ranking exercises, semi-structured interviews, observation, photographs, and so on. With their local knowledge and their new skills combined it is argued they can begin to develop the expertise to judge which tools are appropriate to use within their community and can suggest new tools.

- 'Planning for real' is an exercise that uses a 3-D model to enable local people to put forward suggestions for improvement or to identify current problems. The model is usually made by local people, and is constructed on a scale that enables participants to recognise familiar landmarks easily, and uses materials that enables it to be used in places where people naturally meet. The technique was developed by the Neighbourhood Initiatives Foundation (www.nif.co.uk).

6. Conclusions

6.1 *Gaining, accessing and sharing information*

- There is scope and a need for a network to collate and share the disparate literature on regeneration initiatives and health.

- A systematic review facility for research in this area should be developed. This could be linked with the newly established International Campbell Collaboration, the aim of which is to promote and support the production of high-quality systematic reviews of research-based evidence on the effectiveness of interventions in the fields of education, social policy and welfare, and criminal justice.

6.2 *Agreeing what should count as evidence*

- Those involved in the regeneration field need to develop a shared understanding about what is to count as evidence to inform policy development and implementation; to measure process; and to evaluate impact. This should include more discussion of the relationship between findings from different research paradigms, including, in particular, participative approaches and experimental designs.

- Currently, assessments about what is good or reliable research are strongly linked to disciplines, professions and sectors – what counts as 'evidence' for one may not for another. Regeneration initiatives, like community development in health, cannot be the domain of any single group and the evidence required to assess 'what works' must be generated on a multi-disciplinary basis. This means developing new, more inclusive 'rules of evidence', to be applied when reviewing existing research and new methods for evaluation specific to the task.

6.3 *Developing evaluation methods*

- The scope for extending the use of experimental designs in the evaluation of regeneration initiatives should be discussed by researchers involved this field and the potential for innovative designs identified.

- More attention should be given to the development of methods for the evaluation of regeneration initiatives as a whole, rather than discreet projects within them.

- There is a need for more longitudinal studies involving the collection of routinely available data, new quantitative survey data, and qualitative subsets.

- The role of people living within regeneration areas in the design, conduct and analysis of research needs to be developed, including the use of participatory evaluation.

6.4 *Future research*

- There is an urgent need for systematic reviews of existing research, including the findings of studies of earlier waves of regeneration and studies from a range of countries.

- More attention should be directed at evaluating new ways of implementing regeneration initiatives that seek to give control to local residents in the management of change.

- More research is needed to explore the extent to which normative notions of 'proper places' differ in significant ways between regeneration professionals and the people experiencing regeneration.

- Partnership development has tended to focus on improving inter-agency working relationships at the expense of developing equitable partnerships with local people. Organisational development to support more equal working relationships with local people needs to be supported.

- Applied research is needed to explore the type of physical, social and economic interventions that would result if policy were informed to a greater extent that at present by the knowledge of local people.

- Incentives should be developed in funding mechanisms to encourage greater multi-disciplinary research on the impact of regeneration initiatives on health.

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APPENDIX 1

Sources of Information on Regeneration and Health.

A number of avenues have been identified through which access to literature on regeneration and health may fruitfully be identified. These include:

- The National Research Register (www.doh.gov.uk/research/index.htm)

The National Research Register is a database accessed through the Department of Health's web site of recently completed and on-going research that is of interest to the National Health Service. A small number of projects are listed here, though details are sparse and contact information is often out of date, which sometimes makes it difficult to access the literature on findings. In addition, the register does not capture much of the broader-based social research that exists.

- DETR web site (www.regeneration.detr.gov.uk)

The Department of the Environment, Transport and the Regions (DETR) publish guidance for regeneration partnerships in England that is easily accessed through their web site. It includes extensive information on regeneration activity, including evaluations and updates on the implementation of key government regeneration initiatives. There is, however, little information on the impact of regeneration on people's health.

- Local Government Association (www.lga.gov.uk)

The LGA web site is a useful source of information on current regeneration initiatives and policies. It collects up-dates on regeneration initiatives. It has recently conducted a study to map local authority action to tackle inequalities in health through social and economic regeneration. The LGA has also funded, with the DETR and Joseph Rowntree Foundation, a two-year evaluation of the 22 pathfinder areas in the New Commitment to Regeneration.

- The Joseph Rowntree Foundation (www.jrf.org.uk)

The JRF has supported an area regeneration research programme. This research focuses on the impact of regeneration on tackling social exclusion and on local responses to initiatives. Again, however, there is little that directly focuses on the way in which health is affected.

- The Chartered Institute of Housing (www.cih.org)

The Chartered Institute of Housing is a professional body for individuals working in the housing profession. It has a specialist resource library and extensive database of current housing practice, innovative strategies, etc.

- The Economic and Social Research Council Health Variations Research Programme

The Economic and Social Research Council currently runs a Health Variations Research Programme that supports a number of projects relevant to an understanding of the link between regeneration and health. Of particular relevance is research that assesses the impact of urban regeneration on mental health.
http://www.lancs.ac.uk/users/apsocs/hvp/phase2.htm#southall

- University-based research institutes

Dedicated research institutes, such as Sheffield Hallam University's Centre for Regional and Economic and Social Research (CRESR), the Centre for Urban and Regional Research at the University of Sussex, the Health and Social Policy Research Centre at the University of

Brighton, the Centre for Urban and Community Research at Goldsmiths College in the University of London, and the MRC's Social and Public Health Sciences Unit at the University of Glasgow, are examples of places where research has been done in this area.

- Journals

The most fruitful journals proved to be the following: Housing Studies, Health-lines, Health and Place, Regional Studies, Town and Planning Review, Cities, and Social Science and Medicine

- BURA – The British Urban Regeneration Association (www.bura.or.uk)

BURA is an independent organisation promoting best practice in all aspects of regeneration. It is a forum for the exchange of ideas, experience and information. Its web site contains information of events it hosts to facilitate the sharing of ideas and details of projects that have received its best practice awards. While this is a good route to identify current initiatives, there is little direct focus on the health impacts of regeneration.

- Internet search engines

Searching the Web using search engines such as Alta Vista and a search using the words 'urban + regeneration + health' produced some interesting leads.

- International Literature and North American Organisations

The international literature was harder to access. Initially, information was gathered using key contacts in North America, and amongst those who had conducted work on health and development in low-income countries. North American contacts posted messages on key Internet-based 'list servers' concerned with urban planning, including the American Sociological Association's section on community and urban society. This method had some success and information on a small number of key organisations concerned with regeneration and health was sent. These included the California Wellness Foundation (www.tcwf.org), the US Department of Housing, and the Urban Development's Office of Policy Development and Research (www.huduser.org). The Rockefeller Foundation was also contacted directly. However, although they conduct relevant research, they were unable to identify literature, other than UK literature, that directly linked regeneration with impacts on health. Literature linking development and health in low-income countries focused on discussions of why and what developments have succeeded in reducing mortality rates. In particular, the literature explored why some low-income countries have mortality rates approaching those of wealthier, industrialised countries. Useful references may be available through the World Bank Web-site.