



EDPHiS



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EDPHiS

Environmental Determinants of Public Health in Scotland

D.3 – Literature Review: Mental health and Wellbeing Case Study

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EDPHiS



Environmental Determinants of Public Health in Scotland (EDPHiS)

Mental Health & Wellbeing Case Study

Scoping Report

Salim Vohra

Fintan Hurley

Yvette Christopher

Anne Ellaway

Paul Teedon

Clive Sabel

Allyson McCollam

Joanne Crawford

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FOREWORD

EDPHiS and its role in relation to Good Places, Better Health

EDPHiS (Environmental Determinants of Public Health in Scotland) is a multi-disciplinary collaborative scientific project, funded by the Scottish Government, and designed to inform the development of policy on environment and health in Scotland. As such, EDPHiS is one of the four components of the Intelligence Partnership of Good Places, Better Health (GPBH), whose current (Prototype) phase focuses on how young people in Scotland experience the physical environment, and how that impacts on the four GPBH priority health-related effects of obesity, unintentional injuries, asthma, and mental health and well-being.

GPBH is concerned ultimately with protecting and improving the health of Scotland's young people, and reducing health inequalities among them, by identifying and informing the implementation of policies and actions which protect and improve health through improvements to the physical environment in Scotland, and how young people interact with it. Within the GPBH Intelligence Partnership (IP), and working closely with the other IP partners, EDPHiS helps to inform this development of policy by:

- a. Providing evidence reviews of the international scientific literature concerning how the environment affects the lives and health of young people, up to ages 8 or 9 years; and in particular (i) how environmental exposures of young people affect their risks and chances in relation to the four priority health-related effects of GPBH; and (ii) what evidence there is from studies internationally of the success (or not) of interventions intended to improve children's health via the environment.
- b. Working with others in the IP and in Scotland more widely to identify relevant sources of information about Scotland in terms of population, environment, health and other contextual factors that may affect the relationships between environment and health.
- c. Linking these to provide – as far as the scientific evidence and data allow – estimates of the likely benefits to children in Scotland of policies and actions that may affect their health via changes to the environment and/or how children interact with that environment. These estimates also will include an assessment of how the public health effects are distributed across age, gender, urban-rural and indices of social deprivation.

Evidence reviews of the international literature

These were designed to consider in turn the four priority health impacts of the GPBH Prototype, and to be carried out in two phases: First, a preliminary assessment of the evidence to scope approximately the issues to be addressed and to see what kind of evidence there was about them (Phase 1); then, a more detailed and focused assessment aiming to provide quantitative evidence of those relationships which were identified as most relevant and important (Phase 2).

The present set of preliminary evidence assessments

The present set of preliminary evidence assessments took as a starting-point a diagrammatic representation (a 'map') of the relationships linking environment, exposure and health effect, developed using the modified DPSEEA modelling framework (Morris et al., 2006: Getting Strategic about the Environment and Health) adopted by GPBH. These maps were developed in a series of workshops, led by George Morris and Sheila Beck, where experts summarised current best thinking about how the environment relates to and affects public health.

Where maps were as yet unavailable for the priority health effects in young people, or were limited in scope, they were developed further or from new by the EDPHiS team as part of the preliminary evidence assessment. The main focus of the work thereafter was to consider the relationships proposed by the DPSEEA maps and to make a first assessment of the strength of evidence underlying them, especially insofar as that evidence is relevant to Scotland and its young people.

Following the DPSEEA framework, the Phase 1 reports focus both on (i) the Drivers and Pressures which influence the State of the environment, and the behaviours of children in interacting with it, and (ii) relationships between State of the environment, Exposures (i.e. interactions, whether favourable or unfavourable to health, of young people with the environment), and health Effects; with attention throughout on Actions which might improve children's environment and health.

The present set of four reports is the outcome of these preliminary assessments, which largely were completed about 12 months ago. Each of the four reports is the work of a particular multi-disciplinary team within EDPHiS, and so the reports are individually authored accordingly.

Taking the reports as a set, they represent a compromise between a desire for consistency of approach, and the need to allow differences according to (i) health effect, what it means and how it is measured; (ii) the complexity of the issues that arise in the relationships of environment to that health effect in children; and (iii) the strength and maturity of evidence concerning those relationships. Co-ordination of these compromises between the four case studies was overseen by my colleague Hilary Cowie, who is in effect scientific co-ordinator of EDPHiS and Editor-in-Chief of this set of reports.

We welcome comments and suggestions...

We welcome comments and suggestions on these Phase 1 reviews – on how they are useful, on what needs to be changed and on what in addition should be included – relative to their purpose within GPBH, which is to help ensure that proposed policies and actions are informed by evidence. We hope you enjoy reading them, and please use the EDPHiS website to let us know what you think: www.edphis.org.

Meanwhile work is now ongoing on more detailed assessments, and on some cross-cutting issues (methodology; what states of the environment have wide impacts across several health endpoints; information needs), as part of the EDPHiS

contribution to the Intelligence Partnership of GBH; and we plan to complete and publish these in the coming months.

Fintan Hurley,
EDPHiS Principal Investigator
IOM Edinburgh, September 2010

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SUMMARY

Background

This section describes the current mental health and wellbeing in children in Scotland; the current Scottish policy context in relation to children and adult's mental health and wellbeing; the emerging issues from the EDPHiS mental health and wellbeing case study; and key definitions/conceptualisations.

Children's mental health and wellbeing in Scotland

Children and young people's mental health and well-being is affected by many aspects of their lives including school experience, friendships and peer relations, as well as family life and family relationships.¹ The most recent figures for children's mental health and wellbeing come from the 2004 Office for National Statistics survey 'Mental Health of Children and Young People'. It found that 8.3% of children in Scotland aged 5-15 had a clinically recognised emotional or behavioural mental health problem. Five and a half percent had clinically significant conduct disorders; 2.5% were assessed as having emotional mental health problems (anxiety and depression); and 1.6% were rated as hyperactive. Boys were more likely than girls to have a mental health problem (9% compared to 7%). There was, between 1999 and 2004, a decrease in the proportion of those with an emotional mental health problem, from 4.6% to 2.5%.

Key findings from Health Behaviours of School Children survey of children aged between 11 and 16 are:⁹

- Gender differences and age differences from earlier surveys persist in 2006 with higher levels of happiness, life satisfaction, perceived health and confidence among boys and younger adolescents.
- Young people living with both parents are more likely to report excellent health, high life satisfaction and happiness and less likely to report multiple health complaints than those living in single parent or step families.
- The small proportion of young people who live in remote rural Scotland have high life satisfaction but those living in urban areas and accessible towns are more likely to feel confident. Levels of happiness are highest among girls living in remote rural Scotland and boys living in urban areas and accessible towns.
- Young people from high affluence families are more likely to report feeling happy and having excellent health than those from low affluence families and average life satisfaction increases with family affluence.
- Between 1994 and 2006 young people's happiness and confidence has increased and the proportion of young people reporting multiple health complaints has fallen.

Scottish policy context on mental health and wellbeing

Improving mental health is both a public health priority and a national priority in Scotland for over two decades. Across all these policies the mental health and

¹ Child and Adolescent Health Research Unit. University of Edinburgh. 2007. Mental well-being of young people in Scotland 1994-2006. HBSC Briefing Paper 14.

wellbeing of children and young people has been an important element. The key policy documents over this time have been²:

- Towards a Mentally Flourishing Scotland (Scottish Government, 2009)
- Better Health, Better Care (Scottish Government, 2007)
- Delivering for Mental Health (Scottish Executive, 2006)
- Delivering for Health (Scottish Executive, 2005)
- Children and Young People's Mental Health: a framework for promotion, prevention and care (2004)
- Improving Health in Scotland: The Challenge (Scottish Executive, 2003)
- Partnerships for Care: Scotland's Health White Paper (Scottish Executive, 2003)
- National Programme for Improving Mental Health and Wellbeing (Scottish Executive, 2001).
- Our National Health: a plan for action, a plan for change (Scottish Executive, 2000)
- Towards a Healthier Scotland (The Scottish Office, 1999)

EDPHiS mental health and wellbeing case study

There are three challenges for this case study: a) lack of an extensive literature on physical environment and mental health and wellbeing particularly as it relates to children's mental health and wellbeing; b) the difficulty of developing a holistic DPSEEA model for MH&W given the complex range of health outcomes covered by the term; and c) the diverse terminology used to understand and investigate mental health and wellbeing.

Given the above, our current working assumption is that while there is not a complete congruence between how children and adults are affected by the physical environment there is likely to be significant and important overlaps between the factors that influence adult and children's mental health and wellbeing in relation to the built and natural environment. What is likely to differ and to be potentially more significant are the contextual and mediating factors at work. There is also an important interaction between the physical and the social environment. There is a strong influence of the social environment on children's mental health and wellbeing e.g. parents, siblings, friends as well as the wider social network of school. It is likely that the social environment plays a dominant as well as mediating role in relation to the effect of the physical environment on children's mental health and wellbeing. This is seen in the mixture of social and physical environmental factors that are being considered as exposures in this case study e.g. fear of violence, feeling unsafe.

Conceptualisations of mental health and wellbeing

There is no single universal internationally accepted definition of mental health and wellbeing. There are currently a range of overlapping definitions.³ The field of mental health is full of disputed terminology with many different definitions, influenced by

² NHS Health Scotland. 2007. Establishing a core set of national, sustainable mental health indicators for adults in Scotland: final report.

³ Department for Children, Schools and Families, England. 2008. What do we mean by 'wellbeing' and why might it matter? Research Report DCSF-RW073.

age, class and gender, people's experiences and expectations, and cultural and religious beliefs.⁴

Overall, there is increasing evidence to suggest that mental health is composed of two dimensions: mental health problems (a negative dimension) and mental wellbeing (a positive dimension).⁵ Mental health problems range from mild subclinical conditions to severe and enduring clinically diagnosed mental illness. Mental wellbeing is more than the absence of mental health problems: features of mental wellbeing include high life satisfaction, mastery and a sense of control, having a purpose in life, a sense of belonging and positive relationships with others. Mental health influences how we think and feel, about ourselves and others, and how we interpret events. It affects our capacity to learn, to communicate and to form, sustain and end relationships. It also influences our ability to cope with change, transition and life events.

Definitions for mental health and wellbeing are very difficult to operationalise in terms of specific mental health and wellbeing endpoints so that specific DPSEEA causal chains can be developed. Some recent NHS Health Scotland work has developed mental health and wellbeing indicators for adults and a mental Edinburgh Warwick mental health and wellbeing scale to measure this. This programme is currently working to developing mental health indicators for children and young people. This work has and is likely to continue to inform this case study on identifying and thinking about more specific and more precise health endpoints within the overarching term of (adult and) child mental health and wellbeing.

Conceptualisations of environment

Definitions of environment are as wide ranging as the disciplines that study it. In this case study the following definitions have been used to conceptualise the physical and social environment:⁶

“The physical environment can be thought of as including the natural environment, which refers to plants, the atmosphere, weather, and topography, and the built environment, which refers to buildings, spaces, transportation systems, and products that are created, or modified, by people. Physical environments can consist of particular individual or institutional settings (e.g. homes, worksites, schools, health care settings, recreational settings) as well as surrounding neighbourhoods and related community areas where individuals live, work, travel, play, and conduct their other daily activities. The physical environment can harm individual and community health, especially when individuals and communities are exposed to toxic substances, irritants, infectious agents, stress-producing factors (e.g. noise), and physical hazards in homes, schools, worksites, and other settings and as part of transportation systems. Physical barriers within these environments can present

⁴ Scottish Executive. 2006. Mental health improvement 'concepts and definitions'. Briefing Paper for the National Advisory Group.

⁵ NHS Health Scotland. 2007. Establishing a core set of national, sustainable mental health indicators for adults in Scotland: Rational Paper. Updated October 2007.

⁶ US Department of Health & Human Services. Developing Health People 2020. Appendix 7: Physical and social environment draft definitions and key concepts. Third Meeting June 5 and 6 2008. <http://www.healthypeople.gov/HP2020/advisory/FACA3Appendix7.htm>

tangible safety hazards or impediments to persons with disabling conditions. The physical environment also can promote good health and wellbeing, e.g. through exposure to nature or favourable aesthetic attributes of neighbourhoods, or by providing community settings and environments that facilitate healthful behavioural choices in such areas as diet, physical activity, alcohol use, and tobacco use.”

“**The social environment** includes interactions with family, friends, co-workers, and others in the community, as well as societal attitudes, norms, and expectations. It encompasses social relationships and policies within such settings as schools, neighbourhoods, workplaces, businesses, places of worship, health care settings, recreation facilities, and other public places. It includes social modelling of healthful behaviours (e.g. tobacco use, substance abuse, physical activity) in the community. It also encompasses social institutions, such as law enforcement and governmental as well as non-governmental organizations. At the community level, the social environment can reflect culture, language, political and religious beliefs, social norms and attitudes (e.g. discriminatory or stigmatizing attitudes), as well as socioeconomic conditions (e.g. poverty), exposure to crime and violence, social cohesion, and social disorder through indicators such as trash and graffiti. Mass media and emerging communication and information technologies such as the worldwide web and cellular telephone technology are a ubiquitous component of the social environment that can affect health and wellbeing. The social environment also includes availability of resources, based on socioeconomic conditions, to meet basic daily needs, including adequate incomes, health insurance, personal assistance services, and healthful foods. At a societal level, policies made in governmental, corporate, and non-governmental sectors can impact health and health behaviours in whole populations both positively and negatively. At the same time, individuals, their behaviours, and their ability to interact with the larger community contribute to the quality of the social environment, as do the resources available in neighbourhoods and the community.”

DPSEEA chains

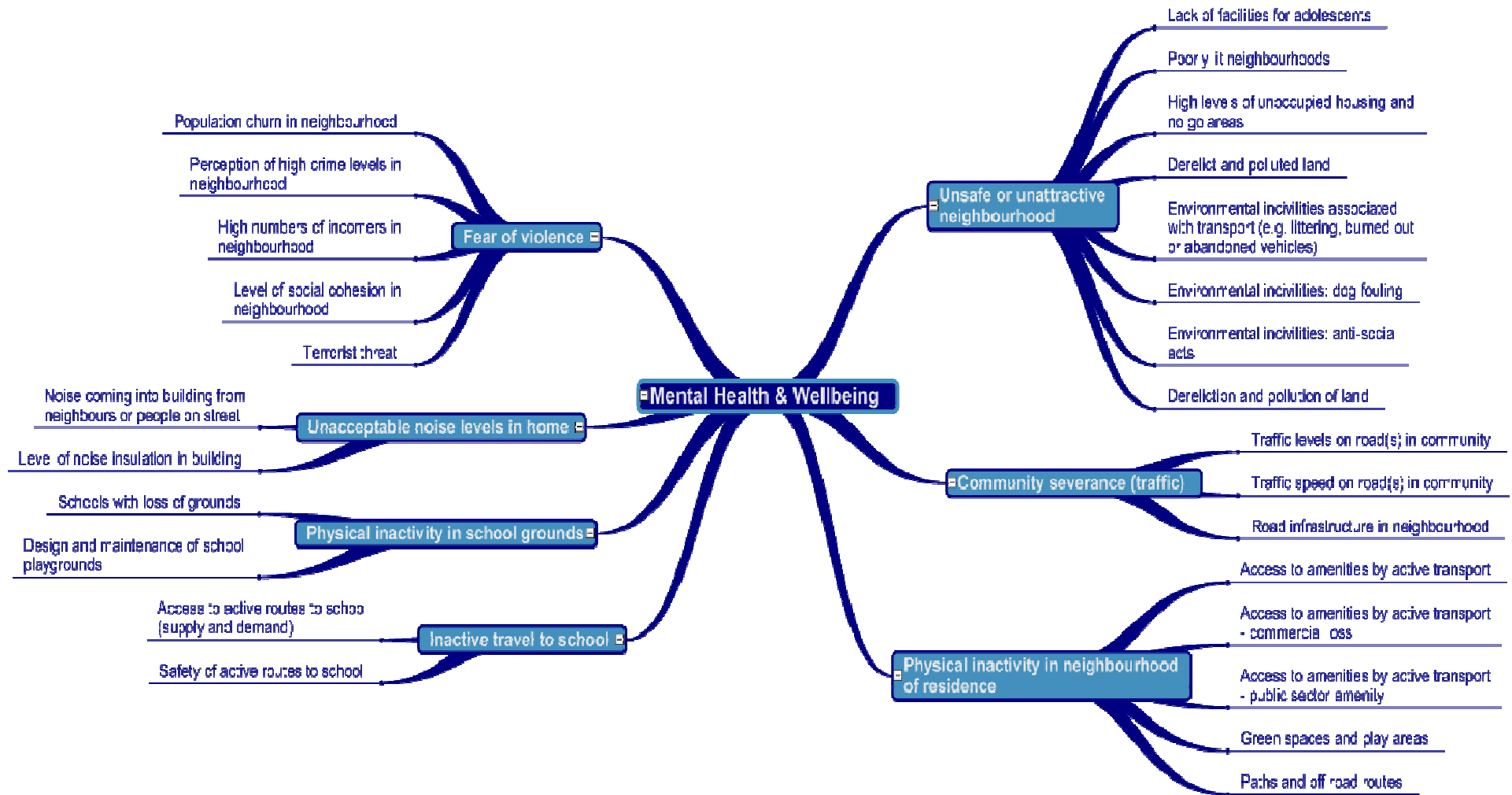
While the project formally started in April 2008, the MH&W case study started in Sep/Oct 2008. This was due to MH&W being seen as part of the Phase 2 work programme and the DPSEEA Models and causal chain lists were still in development. Over the last 12 months scoping work has been carried out including the collection of existing literature reviews on children’s mental health and wellbeing and the physical environment as well as developing a high level holistic DPSEEA Model for MH&W.

The current phase involves examining the models and causal chains within a single holistic model (See Figure 1). We have therefore begun examining the literature review in detail and have also begun refining the DPSEEA Models and causal chain lists. Through this process we have identified a number of insights:

- The importance of keeping children in mind when developing the DPSEEA models and causal chains.
- The need to consider the interaction between the physical and social environments and how these can be best separated out so that the focus is on physical environment as the exposure and social environment as the context.

- The difficulty of developing a holistic DPSEEA all-in-one model for children's mental health and wellbeing.
- The need to consider positive as well as negative influences and impacts e.g. considering sound as an ambient property which encompasses positive sounds as well as negative noises.
- The need to incorporate and understand the biological precursors of positive mental health and wellbeing and psychological distress and mental illness between Exposures and Effects (as defined in the DPSEEA framework).

Figure 1: Mental health and wellbeing: maps held by NHS Health Scotland



Summary of evidence

This section provides brief overview of the findings to date from existing reviews and reports on adult and child mental health and wellbeing.

Overall, the literature in this area is focused on adults and is largely made up of cross-sectional studies often with relatively low response rates. These issues are the major limitations in assessing the significance and influence of the physical environment on mental health and wellbeing in general and specifically in relation to children aged 9 years and under.

The key reviews we identified are:

- The effect of the physical environment on mental wellbeing, State of Science Review SR-DR2, Mental capital and Wellbeing Foresight Report, 2008.
- The urban environment, Royal Commission on Environment and Pollution, 2007.
- A systematic review on the effect of the built and physical environment on mental health. Mental Health Foundation, 2006.

The central insight of the Foresight State of Science report and one that has an important bearing on this case study is that the main factors contributing to mental wellbeing relate strongly to sensory stimulation, that is, what we see, smell, touch, taste and hear. The three main aspects of the physical environment, emerging from the literature review, and their influence on mental health and wellbeing in adults and children are:

The quality of the fabric of the physical environment

This includes the design and construction of buildings, the spaces between buildings (e.g. parks) and associated infrastructure as well as the maintenance and regeneration of spaces and places. The quality of the physical environment also can be viewed at different scales, from neighbourhood/locality, district and city/town.

The quality of the ambient environment

This includes, for instance, acoustics, lighting and air quality as well as temperature, colour, ventilation, humidity, access to nature, having views of nature, natural sunlight and having plants in offices and homes.

The psychological impact of the physical and ambient environment.

This includes our perceptions of density and crowding, sense of safety and fear and way-finding. Again, access to nature, having views of nature and natural sunlight and having plants in offices and homes also significantly contribute to our psychological relationship with the physical environment and, consequently, to our mental capital and wellbeing.

Housing quality

Overall, poor housing quality can lead to poorer mental health. Housing quality is defined as dry (no damp or condensation), comfortable temperature depending on the season (not cold or too warm), good natural lighting, space, well maintained, indoor air quality, etc. The more problems with housing for adults and children the

greater the likelihood of psychological distress. The key mental illness associated with poor housing are depression and anxiety.

Individuals, adults and children, living in **high rise buildings**, particularly in poorer housing areas, can also suffer from significantly higher levels of mental health problems. This seems to relate to feeling more isolated and alone the higher up a high rise building you live.

Similarly, individuals living in **high household density**⁷ dwellings (i.e. overcrowded conditions), particularly when the other people in the household are not family, experience higher levels of mental ill health. For children, having their own space for play and doing their school homework; design that minimises uncontrollable social interactions and floor plan layouts that provide better room separation/more interconnected spaces (more depth) are important in mitigating the effects of high household density.

Neighbourhood quality

Similar to housing, poor neighbourhood quality also adversely affects mental health and wellbeing. The key physical aspects of the neighbourhood are: number of derelict buildings, cleanliness of the streets; incidences of graffiti, and other forms of neighbourhood level physical disorder.

It is currently unclear what impact travelling through other neighbourhoods has on adult and child mental health and wellbeing.

High urbanicity (i.e. population/community density) living is also associated with poorer mental health and increased risk of mental illness.

Noise, unwanted sound that causes annoyance, is associated with poorer quality of life and in the case of children poorer cognitive development. Airport noise is seen as having a particularly detrimental effect.

Green and open spaces

Having access, either as a view or through physical access to gardens or natural areas is associated with better mental health for both adults and children.

Contextual factors examined

- Neighbourhood level social disorder: greater levels of neighbourhood violence, witnessed or experienced, in adults and children leads to poorer mental health and wellbeing.
- Housing tenure: mixed and unclear findings, insecure tenancy can adversely affect mental health and wellbeing.
- Sense of belonging to the community: a sense of belonging is positively associated with mental health and wellbeing.

⁷ The use of the term density i.e. the number of people living per unit of space is seen to be more objective than overcrowded which is seen to be a perceived and subjective aspect and is likely to differ depending on social or cultural context.

Additive/synergistic effects

All the above have additive and/or synergistic effects which can amplify their effects on mental health and wellbeing at individual, household and community levels.

Recommendations for phase 2

Our forward plan to March 2010 is to:

1. Refine and develop a holistic DPSEEA model and causal chains/lists working closely with NHS Scotland (Sheila Beck) and her forward plan of workshops on mental health and wellbeing.
2. Synthesise the existing evidence base by going through the literature identified in existing reviews and where necessary conduct an additional literature review taking into account the last two years and a focus on children. This includes evidence on the effectiveness of policy interventions.
3. Identify associations that can be quantified and incorporating them into the emerging DPSEEA model and causal chains/lists.
4. Identify one or more mental health and wellbeing specialists with expertise in children's mental health and wellbeing and the role of the physical environment to help inform and advise on the work of the case study.
5. Assess the implications for data sources and some investigations with existing datasets in relation to MH&W issues in Scotland.
6. Assessing the implications of the case study and the refined DPSEEA model and causal chains/lists for policy and decision-making.

1 Mental health and wellbeing in Scotland

Mental health problems (ranging from mild subclinical symptoms to clinically diagnosed illness) cause a large and increasing burden that contributes to high costs to societies, long-lasting disability, increased mortality and enormous human suffering.⁸ Some of the major mental health problems perceived to be public health issues are depression, anxiety, substance misuse disorders, psychosis and dementia. It is predicted by The World Health Organisation (WHO) that by 2030 depression will be second only to HIV/AIDS as an international health burden.⁹

Equally, mental wellbeing is important for individuals as well as for society. At an individual level mental wellbeing enables people to realise their intellectual and emotional potential and to find and fulfil their roles in social, school and working life. At society level mental wellbeing is a resource for social cohesion and better social and economic welfare.¹⁰ This is underpinned by a wealth of evidence that "mental health is produced socially: the presence or absence of mental health is above all a social indicator and therefore requires social, as well as individual solutions".¹¹

In 2006, the mean Warwick-Edinburgh Mental Well-Being Scale (WEMWBS) score for Scottish adults aged 16+ was 51 (out of a scale of 14 to 70). There was some evidence that those in the highest income band had higher scores than those in the lowest income bands.¹²

The mean life satisfaction score for Scottish adults aged 16+ in 2006 period was 7.4, on a scale of zero (extremely dissatisfied) to 10 (extremely satisfied). Levels of life satisfaction have not changed significantly since 2002.

In 2000, prevalence of neurotic disorders in the Scottish population was around 141 cases per 1000 adults.¹³ The most prevalent neurotic disorder among the population as a whole was mixed anxiety and depression (68 cases per 1000), followed by generalised anxiety disorder (38 cases per 1000). Prevalence rates were higher among women than men for most neurotic disorders except panic disorder (17 cases per 1000 for men, 8 cases per 1000 for women) and obsessive-compulsive disorder (8 cases per 1000 for both men and women).

Adult mental health and its associated contextual factors in Scotland have seen much stability over the last decade, with more indicators showing improvement than

⁸ Scottish Public Health Observatory. 2009. Mental health: as a public health issue.

http://www.scotpho.org.uk/home/Healthwell-beinganddisease/MentalHealth/Introduction/mental_phissue.asp

⁹ World Health Organization. 2005. Updated projections of global mortality and burden of disease, 2002-2030: data sources, methods and results. Evidence for Information for Policy Working Paper.

¹⁰ Keyes CLM. 2002. The Mental health continuum: from languishing to flourishing in life. Journal of Health and Behaviour Research.

¹¹ World Health Organization. 2009. Mental health, resilience and inequalities.

¹² The Warwick-Edinburgh Mental Well-Being Scale (WEMWBS) is a new scale that measures adult mental wellbeing, based on responses to 14 questions. WEMWBS runs from 14 (the lowest level of wellbeing) to 70 (the highest).

¹³ Office for National Statistics. 2000. Psychiatric morbidity among adults living in private households.

deterioration. However, they are unevenly distributed across the Scottish adult population, with inequalities evident for age, gender, deprivation and socioeconomic status e.g. women had a higher prevalence than men for all neurotic disorders.¹⁴

Children and young people's mental health and well-being is affected by many aspects of their lives including school experience, friendships and peer relations, as well as family life and family relationships.¹⁵ Adolescence can be a time of emotional distress for a number of young people, brought on by biological and psychological changes occurring through puberty, in conjunction with external changes such as school transitions, changing peer and friendship networks and changes in family structure and relationships. Parental separation and re-partnering often result in further upheavals in the home environment such as parent-child conflict, economic hardship and family disorganisation. Good emotional and physical health enables young people to deal with these challenges and eases the transition through adolescence. Promoting young people's mental health and wellbeing can therefore have long-term benefits for individuals and societies.

The most recent figures for children's mental health and wellbeing come from the 2004 Office for National Statistics survey 'Mental Health of Children and Young People'. It found that 8.3% of children in Scotland aged 5-15 had a clinically recognised emotional or behavioural mental health problem. 5.5% had clinically significant conduct disorders; 2.5% were assessed as having emotional mental health problems (anxiety and depression); and 1.6% were rated as hyperactive. Boys were more likely than girls to have a mental health problem (9% compared to 7%). There was, between 1999 and 2004, a decrease in the proportion of those with an emotional mental health problem, from 4.6% to 2.5%. Findings on the impacts of the neighbourhood where children live were inconclusive though many more children with mental health problems lived in poorer areas.

A similar picture emerges from the most recent 2007 survey for which there is not currently a Scotland-specific breakdown.¹⁶ However, the survey was able to detect that children and young people who were less positive about living in their neighbourhood in 2004 were more likely to develop an emotional disorder. The survey analysis suggests that it is the social capital/relationships/support aspects of neighbourhood which are the predominant factors.

EDPHiS has not found data as yet on school-aged children aged 5-9 specifically however key findings from the Health Behaviours of School Children survey of children aged between 11 and 15 show that:⁹

- There are gender differences and age differences between children with higher levels of happiness, life satisfaction, perceived health and confidence among boys and younger adolescents.

¹⁴ NHS Health Scotland. 2009. Scotland's mental health and its context: adults 2009.

¹⁵ Child and Adolescent Health Research Unit. University of Edinburgh. 2007. Mental well-being of young people in Scotland 1994-2006. HBSC Briefing Paper 14.

¹⁶ Office for National Statistics. 2008. Three years on: survey of the development and emotional well-being of children and young people.

- Young people living with both parents are more likely to report excellent health, high life satisfaction and happiness and less likely to report multiple health complaints than those living in single parent or step families.
- The small proportion of young people who live in remote rural Scotland have high life satisfaction but those living in urban areas and accessible towns are more likely to feel confident. Levels of happiness are highest among girls living in remote rural Scotland and among boys living in urban areas and accessible towns.
- Young people from high affluence families are more likely to report feeling happy and having excellent health than those from low affluence families and average life satisfaction increases with family affluence.
- Between 1994 and 2006 young people's happiness and confidence has increased and the proportion of young people reporting multiple health complaints has fallen.

2 Scottish mental health and wellbeing policy context

Improving mental health is both a public health priority and a national priority in Scotland for over two decades. Across all these policies the mental health and wellbeing of children and young people has been an important element. The key policy documents over this time have been¹⁷:

- Towards a Mentally Flourishing Scotland (Scottish Government, 2009)
- Equally Well (including recommendations on children's play) (Scottish Government (2008)
- Better Health, Better Care (Scottish Government, 2007)
- Delivering for Mental Health (Scottish Executive, 2006)
- Delivering for Health (Scottish Executive, 2005)
- Children and Young People's Mental Health: a framework for promotion, prevention and care (Scottish Executive, 2004)
- Improving Health in Scotland: The Challenge (Scottish Executive, 2003)
- Partnerships for Care: Scotland's Health White Paper (Scottish Executive, 2003)
- National Programme for Improving Mental Health and Wellbeing (Scottish Executive, 2001).
- Our National Health: a plan for action, a plan for change (Scottish Executive, 2000)
- Towards a Healthier Scotland (The Scottish Office, 1999)

In 2001, the Scottish Government's National Programme for Improving Mental Health and Well-Being was established as part of the Scottish Government's drive for health improvement, public health and social justice. Its vision was to help improve the mental health of everyone in Scotland and to improve the quality of life, well-being and social inclusion of people who experience mental health problems.

The Action Plan for 2003-2006 implemented this vision: to raise the profile of, and support further action in, mental health improvement; to address the stigma of mental health problems; to prevent suicide; and to promote and support recovery. Continuing as a key part of overall health improvement, the proposed direction and emphasis of the National Programme for Improving Mental Health and Wellbeing in Scotland from 2008 to 2011 is to:

- Promote and improve mental health.
- Prevent mental health problems, mental illness, co-morbidity and suicide.
- Support improvements in the quality of life, social inclusion, health, equality and recovery of people who experience mental illness.
- Address inequalities in mental health.
- Promoting positive mental health is seen to apply to each of the above main themes of promotion, prevention and support.

¹⁷ NHS Health Scotland. 2007. Establishing a core set of national, sustainable mental health indicators for adults in Scotland: final report.

In May 2009, a new action plan on mental health improvement, Towards a Mentally Flourishing Scotland was published which set out various commitments in mental health improvement for 2009-11; some commitments are new, whilst others are designed to build on the achievements of recent years under the former National Programme for Improving Mental Health and Wellbeing. This made the following commitments in relation to Priority 1 mentally health infants, children and young people:

- Commitment 1: The Scottish Government will work with partners and existing networks to develop by 2010 a web portal on mental health improvement for those working with infants, children and young people.
- Commitment 2: Promoting Well-being and Meeting the Mental Health Needs of Children and Young People: A Development Framework for Communities, Agencies and Specialists involved in Supporting Children, Young People and their Families outlines the competencies needed for mental health improvement work with children and young people. We will build on this work and focus on infant mental health improvement. NHS Health Scotland will work with partners to improve the skills and knowledge of front-line staff with a particular focus on inequalities.
- Commitment 3: There are many effective interventions for mental health improvement among infants, children and young people; however, many of these are not in general use. NHS Health Scotland will initiate a programme in 2009 to disseminate the evidence base for mental health improvement and support its use through practitioner briefings and narratives to present the case to decision makers and planners.
- Commitment 4: NHS Health Scotland will work with key stakeholders to develop a set of national indicators for children and young people's mental wellbeing, mental health problems and related contextual factors by 2011.

Several national initiatives and infrastructures have been established to take forward components of the National Programme:

- NHS Health Scotland: Mental Health Improvement: details mental health improvement related programme of work being taken forward by NHS Health Scotland and other partners and includes links to Mental Health Improvement learning opportunities, research, publications and related websites.
- NHS Health Scotland: Mental Health Indicators Programme: a project establishing a core set of national mental health indicators for Scotland.
- ISD Mental Health Information Programme: formed to improve the fragmented and poorly developed mental health information within Scottish care settings, in order to help develop service provision and benefit overall service user/client care.
- Choose Life website: national strategy and action plan to prevent suicide in Scotland published in December 2002.
- Scottish Recovery Network: aims to engage communities across Scotland on how best to promote and support recovery from long-term mental health problems.
- See Me Scotland: a national campaign to eliminate the stigma and discrimination that people with mental health problems face.

- Breathing Space: a free and confidential phonenumber service for any individual, who is experiencing low mood or depression, or who is unusually worried and in need of someone to talk to.
- Scotland's Mental Health First Aid Training (SMHFA): a training course that helps people to recognise the signs and symptoms of mental health problems and how to offer initial assistance, support and guidance.
- Healthy Working Lives: A programme designed to promote health improvement among working age people through the workplace. It includes a component designed to give employers the understanding, knowledge and skills to address a wide variety of issues relating to employment and mental health.
- Valuing Young People, 2009 sets out the framework to ensure that all children and young people in Scotland become "successful learners, confident individuals, effective contributors and responsible citizens". This is supported by policy documents such as A Guide to Getting it right for every child, 2008, The Early Years Framework and the Curriculum for Excellence.

3 EDPHiS mental health and wellbeing case study

Mental health and wellbeing encompasses a wide range of positive and negative mental states. Only recently has the focus shifted from diagnosed mental illness to understanding the factors that promote good mental health and positive wellbeing.

There are three challenges for this case study: a) lack of an extensive literature on physical environment and mental health and wellbeing particularly as it relates to children's mental health and wellbeing; b) the difficulty of developing a holistic DPSEEA model for MH&W given the complex range of health outcomes covered by the term; and c) the diverse terminology used to understand and investigate mental health and wellbeing.

Given the above, our current working assumption is that while there is not a complete congruence between how children and adult are affected by the physical environment there is likely to be significant and important overlaps between the factors that influence adult and children's mental health and wellbeing in relation to the built and natural environment. What is likely to differ and are potentially more significant are the contextual and mediating factors at work.

There is also an important interaction between the physical and the social environment. There is a strong influence of the social environment on children's mental health and wellbeing e.g. parents, siblings, friends as well as the wider social network of school. It is likely that the social environment plays a dominant as well as mediating role in relation to the effect of the physical environment on children's mental health and wellbeing. This is seen in the mixture of social and physical environmental factors that are being considered as exposures in this case study e.g. fear of violence, feeling unsafe.

The key questions that this case study will answer by Year 4 are:

- **What do we mean by key concepts such as mental health and wellbeing and environment?**
- **What are the associations between the physical (natural and built) environment and mental health/wellbeing? How strong is the evidence for these associations?**
- **Is there evidence of causality?**
- **Is there evidence for a quantitative 'dose-response' causal relationship to be established?**
- **In what contexts (social, cultural, economic, etc) are these associations/causal relationships found and what contextual factors influence them?**
- **What is literature review evidence on the effectiveness of policy interventions on the natural and built environment to improve mental health and wellbeing?**
- **How can we involve communities (children and parents) in our case study in a way that adds value at scientific, social and policy levels?**

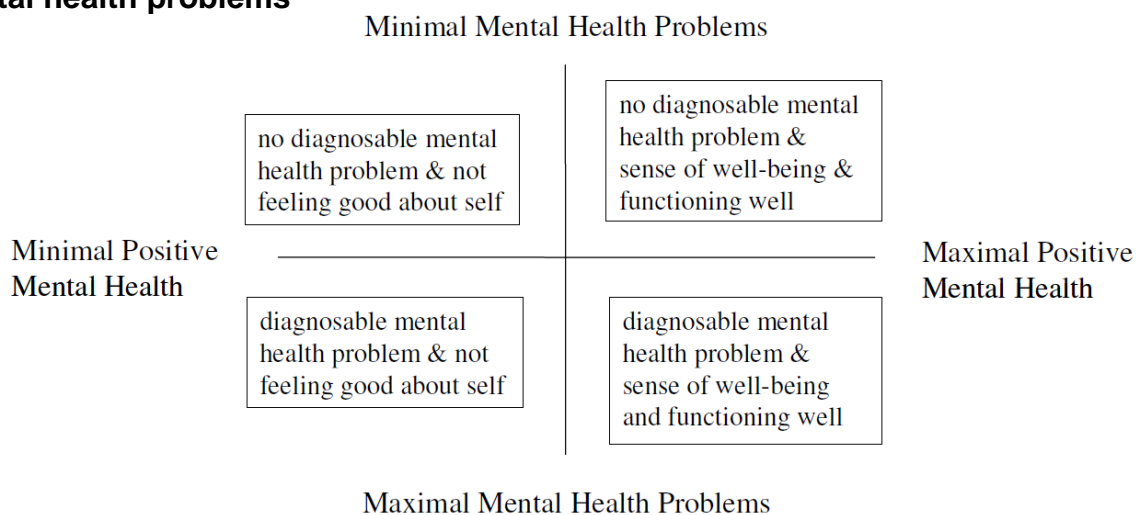
4 Conceptualisations of mental health and wellbeing

There is no single universal internationally accepted definition of mental health and wellbeing. There are currently a range of overlapping definitions.¹⁸ The field of mental health is full of disputed terminology with many different definitions, influenced by age, class and gender, people’s experiences and expectations, and cultural and religious beliefs.¹⁹

The national adult mental health indicator project uses a broad definition of mental health:²⁰

“...mental health has been used as a broad, overarching concept encompassing both positive mental health (often used interchangeably with mental health, mental wellbeing or well-being) and mental health problems (often used interchangeably with mental health, negative mental health, mental illness, mental ill-health and mental distress), drawing on a ‘positive mental health’ model. Thus, positive mental health and mental health problems have been considered as two separate and distinct dimensions of mental health, consistent with the two continua model (Figure 1) (Tudor, 1996; Keyes, 2002; 2005a; 2007). On these continua, positive mental health ranges from a low level to a high level of positive mental health and mental health problems from absence through mild to severe clinically diagnosable illness. This recognises that mental health is not a euphemism for mental health problems nor the absence of mental health problems, and should not be used as such (Herron & Mortimer, 1999; Herron & Trent, 2000). This model also recognises that people with a mental health problem can still experience high levels of positive mental health and vice versa.”

Figure 1: Mental health as a broad concept of positive mental health and mental health problems²¹



¹⁸ Department for Children, Schools and Families, England. 2008. What do we mean by ‘wellbeing’ and why might it matter? Research Report DCSF-RW073.

¹⁹ Scottish Executive. 2006. Mental health improvement ‘concepts and definitions’. Briefing Paper for the National Advisory Group.

²⁰ NHS Health Scotland. 2007. Establishing a core set of national, sustainable mental health indicators for adults in Scotland: Rational Paper. Updated October 2007.

²¹ Tudor K. 1996. Mental health promotion: paradigms and practice. Routledge. London

The Scottish Public Health Observatory provides the definitions of mental health and mental wellbeing.²²

Mental health

Mental health covers a continuum from symptoms at a sub-clinical threshold which interfere with emotional, cognitive or social function to the most severe clinically diagnosed mental illnesses. Examples include common mental health problems such as depression and anxiety, and, severe and enduring mental illness problems such as schizophrenia.

Symptoms of mental health problems at a sub-clinical threshold interfere with a person's cognitive, emotional or social abilities such that their daily living can be impacted, but to a lesser extent than a mental illness. They are more common, are usually less severe and of shorter duration than mental illnesses but may develop into a mental illness. The point at which a mental health problem becomes an illness is not clear-cut, but is usually made on the basis of severity and duration of the symptoms.

Mental illness refers to a diagnosable illness defined through recognised classifications such as the WHO International Classification of Disease (ICD10) or the Diagnostic Statistical Manual Version IV produced by the American Psychiatric Association 1994.

They have traditionally been divided in a variety of ways including distinguishing between:

- Organic (identifiable brain malfunction) versus functional (not due to structural abnormalities of the brain); and
- Neurosis (severe forms of normal experiences such as a low mood, anxiety) versus psychosis (severe distortion of a person's perception of reality).

Terminology however varies considerably across professions and cultures, and in different information sources the definition may include or exclude different conditions.

Mental wellbeing

Most definitions of mental wellbeing emphasise that mental wellbeing includes aspects of subjective wellbeing (affect and life satisfaction), and psychological wellbeing (which covers a wider range of cognitive aspects of mental health than affect and life satisfaction such as mastery and a sense of control, having a purpose in life, a sense of belonging and positive relationships with others). It is more than the absence of mental health problems. According to the Mental Health Foundation individuals with good mental wellbeing:

- develop emotionally, creatively, intellectually and spiritually

²² Scottish Health Observatory. 2009. Mental Health: what is mental health? and Mental Health: mental wellbeing. http://www.scotpho.org.uk/home/Healthwell-beinganddisease/MentalHealth/Introduction/mental_what_is.asp ; http://www.scotpho.org.uk/home/Healthwell-beinganddisease/MentalHealth/Introduction/mental_wellbeing.asp

- initiate, develop and sustain mutually satisfying personal relationships
- face problems, resolve them and learn from them and are able to cope with adversities (i.e. show resilience)
- have the capacity to contribute to family and other social networks, local community and society.
- have a positive sense of well-being
- have individual resources including self-esteem, optimism, and sense of mastery and coherence
- are confident and assertive
- are aware of others and empathise with them
- use and enjoy solitude
- play and have fun
- laugh, both at themselves and at the world.

According to UNICEF child wellbeing is composed of six dimensions: material wellbeing; health and safety; educational wellbeing; family and peer relationships; behaviours and risks; and subjective wellbeing.²³ The World Health Organization, in 2001, has defined mental health as: “A *state of wellbeing in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community and feel a part of it.*”²⁴

In 2003, WHO refined their conceptualisation of mental health in the following way: “*Concepts of mental health include subjective wellbeing, perceived self-efficacy, autonomy, competence, intergenerational dependence and recognition of the ability to realise one’s intellectual and emotional potential. It has also been defined as a state of wellbeing whereby individuals recognize their abilities, are able to cope with the normal stresses of life, work productively and fruitfully, and make a contribution to their communities.*”²⁵

In 2005 they extended this to: “*Mental health and well-being are fundamental to quality of life, enabling people to experience life as meaningful and to be creative and active citizens. Mental health is an essential component of social cohesion, productivity and peace and stability in the living environment, contributing to social capital and economic development in societies.*”²⁶

The New Economics Foundation has defined wellbeing as: “*Well-being is more than just happiness. As well as feeling satisfied and happy, well-being means developing as a person, being fulfilled, and making a contribution to the community.*”²⁷ In its National Accounts of Wellbeing it describes two aspects of wellbeing: personal and social.²⁸ It describes personal and social wellbeing as:

²³ UNICEF. 2007. An overview of child wellbeing in rich countries: a comprehensive assessment of the lives and well-being of children and adolescents in the economically advanced nations. Innocenti Research Centre Report Card 7.

²⁴ World Health Organization. 2001. Mental health: new understanding, new hope.

²⁵ World Health Organization. 2003. Investing in mental health.

²⁶ World Health Organization. 2005. Mental Health Action Plan for Europe.

²⁷ New Economics Foundation. 2004. A well-being manifesto for a flourishing society.

²⁸ New Economics Foundation. 2009. National accounts of well-being: bringing real wealth onto the balance sheet.

Personal wellbeing

Personal well-being is broken down into five main components with a number of subcomponents: emotional well-being (positive feelings and absence of negative feelings); satisfying life; vitality; resilience and self-esteem (self-esteem, optimism and resilience); and positive functioning (which covers autonomy, competence, engagement, and meaning and purpose).

Social wellbeing

Social well-being is made up of two main components: supportive relationships, and trust and belonging. In addition to these indicators, an example of a well-being indicator within a specific area of people's lives was also created – a satellite indicator of well-being at work. This measures job satisfaction, satisfaction with work-life balance, the emotional experience of work, and assessment of work conditions.

A still used definition of mental health is one developed by the former Health Education Authority in 1997: "Mental health is the emotional and spiritual resilience which allows us to enjoy life and to survive pain, disappointment and sadness. It is a positive sense of well-being and an underlying belief in our own, and others' dignity and worth."

The recent UK Government Foresight Group Report on mental capital describes mental wellbeing as: "A dynamic state in which the individual is able to develop their potential, work productively and creatively, build strong and positive relationships with others, and contribute to their community. It is enhanced when an individual is able to fulfil their personal and social goals and achieve a sense of purpose in society."²⁹

It also goes on to define mental capital as: "The totality of an individual's cognitive and emotional resources, including their cognitive capability, flexibility and efficiency of learning, emotional intelligence and resilience in the face of stress. The extent of an individual's resources reflects his/her basic endowment (genes and early biological programming), and their experiences and education, which takes place throughout the life course."²¹

Apart from the UNICEF report there are currently no child-specific definitions of mental health and wellbeing though the notion of emotional wellbeing is used in many UK schools. NICE in a recent publication on child wellbeing in primary schools based its definition on one developed by NHS Scotland "...*mental wellbeing as emotional and psychological health, including the ability to interact socially.*"³⁰ This was developed in the evidence reviews where the outcomes of focus were:³¹

²⁹ Foresight Project. Government Office for Science. 2008. State of science review SR-DR2. The effect of the physical environment on mental wellbeing. Mental capital and wellbeing: making the most of ourselves in the 21st century.

³⁰ National Institute of Clinical Excellence. 2008. Promoting children's social and emotional wellbeing in primary education. Public Health Intervention Scope Paper.

³¹ National Institute of Clinical Excellence. 2007. Mental wellbeing in children in primary education. University of Teeside.

- emotional wellbeing (including happiness and confidence, and the opposite of depression)
- psychological wellbeing (including autonomy, problem solving, resilience, attentiveness/involvement)
- social wellbeing (good relationships with others, and the opposite of conduct disorder, delinquency, interpersonal violence and bullying).

There are also definitions of wellbeing emerging from philosophy, economics, psychology, sociology, anthropology and political science.³²

Mental health and wellbeing is therefore is seen to have four domains:⁷

- **Emotion (affect/feeling)**
- **Cognition (perception, thinking, reasoning)**
- **Social functioning (relations with others and society)**
- **Coherence (sense of meaning and purpose in life)**

The literature on positive mental health and wellbeing identifies two dimensions: **hedonic**, satisfaction of desires and preferences, and **eudaimonic**, associated with life activities in which people participate. Both of which together are sometimes described as **flourishing**.⁷ Lastly, there is also some discussion of the spiritual dimension to mental health and wellbeing.³³

Overall, there is increasing evidence to suggest that mental health is composed of two dimensions: mental health problems (a negative dimension) and mental wellbeing (a positive dimension). Mental health problems range from mild subclinical conditions to severe and enduring clinically diagnosed mental illness. Mental wellbeing is more than the absence of mental health problems: features of mental wellbeing include high life satisfaction, mastery and a sense of control, having a purpose in life, a sense of belonging and positive relationships with others. Mental health influences how we think and feel, about ourselves and others, and how we interpret events. It affects our capacity to learn, to communicate and to form, sustain and end relationships. It also influences our ability to cope with change, transition and life events.

The above definitions are very difficult to operationalise in terms of specific mental health and wellbeing endpoints so that specific DPSEEA causal chains can be developed. Some recent NHS Health Scotland work has developed mental health and wellbeing indicators for adults and a mental Edinburgh Warwick mental health and wellbeing scale to measure this. This programme is currently working to developing mental health indicators for children and young people. This work has and is likely to continue to inform this case study on identifying and thinking about more specific and more precise health endpoints within the overarching term of (adult and) child mental health and wellbeing.

³² Concept of wellbeing and its application in a study of ageing in Aotearoa in New Zealand. Family Centre Social Policy Research Unit. Working paper 8. 2007.

³³ Care Services Improvement partnership (CSIP). 2007. Mental well-being impact assessment: a toolkit.

5 Conceptualisations of environment

Definitions of environment are as wide ranging as the disciplines that study it. In this case study the following definition has used to conceptualise the physical environment:

“The physical environment...is an inclusive concept defined in relatively simple terms as the universal set of all things external to the individual but excluding the social environment with which there is, of course, perpetual interaction. Thus, the physical environment comprises the full spectrum of biological, physical and chemical entities, whether natural or man made.”³⁴

The US Department of Health and Human Services’ ‘Developing Health People 2020’ programme provides a more extended definition of the physical environment an also provides a definition for the social environment which are both useful conceptualisations of the physical and social environments for this case study.³⁵

“**The physical environment** can be thought of as including the natural environment, which refers to plants, the atmosphere, weather, and topography, and the built environment, which refers to buildings, spaces, transportation systems, and products that are created, or modified, by people. Physical environments can consist of particular individual or institutional settings (e.g. homes, worksites, schools, health care settings, recreational settings) as well as surrounding neighbourhoods and related community areas where individuals live, work, travel, play, and conduct their other daily activities. The physical environment can harm individual and community health, especially when individuals and communities are exposed to toxic substances, irritants, infectious agents, stress-producing factors (e.g. noise), and physical hazards in homes, schools, worksites, and other settings and as part of transportation systems. Physical barriers within these environments can present tangible safety hazards or impediments to persons with disabling conditions. The physical environment also can promote good health and wellbeing, for example, through exposure to nature or favourable aesthetic attributes of neighbourhoods, or by providing community settings and environments that facilitate healthful behavioural choices in such areas as diet, physical activity, alcohol use, and tobacco use.”

“**The social environment** includes interactions with family, friends, coworkers, and others in the community, as well as societal attitudes, norms, and expectations. It encompasses social relationships and policies within such settings as schools, neighbourhoods, workplaces, businesses, places of worship, health care settings, recreation facilities, and other public places. It includes social modelling of healthful behaviours (e.g. tobacco use, substance abuse, physical activity) in the community. It also encompasses social institutions, such as law enforcement and governmental as well as non-governmental organizations. At the community level, the social environment can reflect culture, language, political and religious beliefs, social norms

³⁴ Morris GP, Beck SA et al. 2006. Getting strategic about environment and health. Public Health. 120, 889-907.

³⁵ US Department of Health & Human Services. Developing Health People 2020. Appendix 7: Physical and social environment draft definitions and key concepts. Third Meeting June 5 and 6 2008. <http://www.healthypeople.gov/HP2020/advisory/FACA3Appendix7.htm>

and attitudes (e.g. discriminatory or stigmatizing attitudes), as well as socioeconomic conditions (e.g. poverty), exposure to crime and violence, social cohesion, and social disorder through indicators such as trash and graffiti. Mass media and emerging communication and information technologies such as the worldwide web and cellular telephone technology are a ubiquitous component of the social environment that can affect health and wellbeing. The social environment also includes availability of resources, based on socioeconomic conditions, to meet basic daily needs, including adequate incomes, health insurance, personal assistance services, and healthful foods. At a societal level, policies made in governmental, corporate, and non-governmental sectors can impact health and health behaviours in whole populations both positively and negatively. At the same time, individuals, their behaviours, and their ability to interact with the larger community contribute to the quality of the social environment, as do the resources available in neighbourhoods and the community.”

6 Review of DPSEEA models and chains

While the project formally started in April 2008, the MH&W case study started in Sep/Oct 2008. This was due to MH&W being seen as part of the Phase 2 work programme and the DPSEEA Models and causal chain lists still being in development.

Over the last 12 months scoping work has been carried out including the collection of existing literature reviews on children's mental health and wellbeing and the physical environment as well as developing a high level holistic DPSEEA Model for MH&W. This emergent thinking is captured in Figure 2.

The current phase involves examining the models and causal chains within a single holistic model. We have therefore begun examining the literature review in detail and have also begun refining the DPSEEA Models and causal chain lists. Tables 1 and 2 show this group's current work in reviewing and consolidating the causal chains for the neighbourhood factors that have been identified in the Health Scotland MH&W workshops.

Through this process we have identified a number of insights:

1. The importance of keeping children in mind when developing the DPSEEA models and causal chains.
2. The need to consider the interaction between the physical and the social environments and how these can be best separated out so that the focus is on the physical environment as the exposure and the social environment as the context.
3. The difficulty of developing a holistic DPSEEA all-in-one model for children's mental health and wellbeing.
4. The need to consider positive as well as negative influences and impacts e.g. considering sound as an ambient property which encompasses positive sounds as well as negative noises.
5. There are direct impacts on children from their exposure and interactions with the physical environment (natural and built) as well as indirect impacts from the exposure and interactions of key adults, e.g. parents, with the physical environment. This links into Point 2 above.
6. The need to incorporate and understand the biological precursors of positive mental health and wellbeing and psychological distress and mental illness between Exposures and Effects (as defined in the DPSEEA framework).

Figure 2: Mental health and wellbeing integrated DPSEEA model

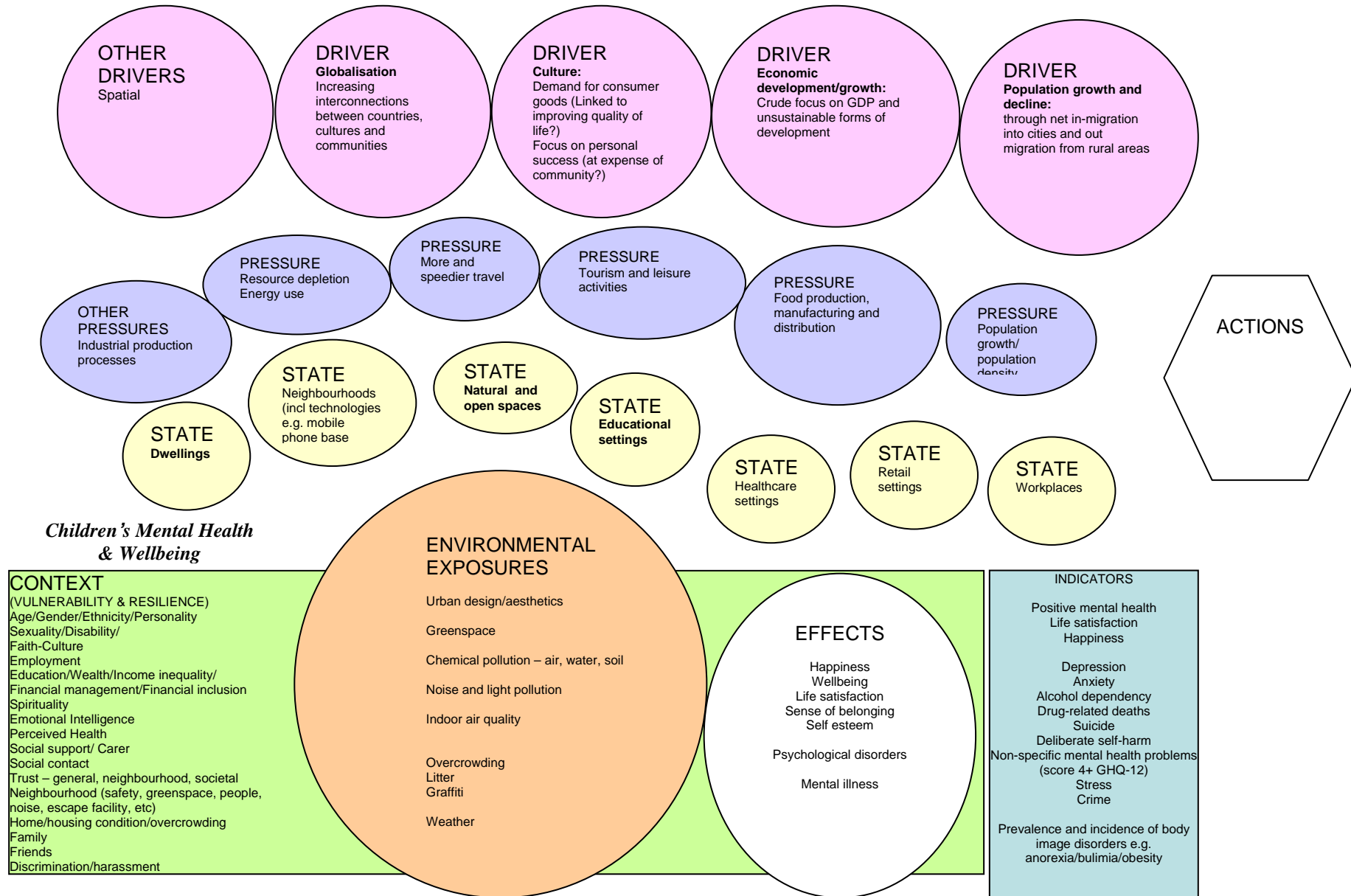


Table 1: Greenspace causal chain (combined causal chain developed from two models emerging from the MH&W workshop)

Aspects in grey have not been considered in detail as yet

DPSEEA chains	Specific link in the chain	Actions
Drivers	<p>Changing household size - increasing housing demand</p> <p>Spatial planning policy</p> <p>Limited accessible greenspace from housing</p> <p>Low fiscal priority for greenspace provision and maintenance</p> <p>Policy of hard landscaping of flood defence areas</p> <p>Spatial planning - importance of greenspace</p>	<p>Consider wider effects in planning system</p> <p>Prioritise needs of walkers and cyclists in planning system</p> <p>View greenspace as community resource</p> <p>National planning guidance</p> <p>Flood defence policies and SUDS - recreational and greening</p> <p>Use of SEA and EIA consideration of wellbeing as well as physical health</p> <p>Priority to provision and maintain greenspace</p> <p>Plant trees to stop wind tunnel effects of multi-storey buildings</p> <p>Encourage sport and physical activity in children and adults</p>
Pressures	<p>Loss or non-provision of greenspaces or other play areas within local neighbourhoods</p> <p>Provision and maintenance of appropriate and attractive greenspace</p> <p>Greening urban environment</p>	
State	<p>Characteristics of greenspace</p> <p>Amount of greenspace</p>	<p>Maintain and where possible extend the amount of greenspace e.g. playing fields</p>

Table 1: Greenspace causal chain (combined causal chain developed from two models emerging from the MH&W workshop)

Aspects in grey have not been considered in detail as yet

DPSEEA chains	Specific link in the chain	Actions
	Accessibility of greenspace	Require provision of greenspace within 5 minute walk of all homes
	Attractiveness of greenspace	Improve access to environments which are conducive to physical activity
	Maintenance of greenspace	Environmental management policies (rapid removal of graffiti, etc.)
	Multi-functionality of greenspace	Enhance the biodiversity of greenspace
	Rules governing the use of greenspace	
Exposure	Children's interaction with greenspace (includes viewing) for a given time period	Physical activity strategies - focused on children Signposting, guided walks to encourage use
Mechanism for effects	Physical activity Social interaction Restoration Direct environmental hazard protection	
Physiological changes on	Physical development, fitness and functioning, weight, energy levels, stress hormones, blood pressure, muscle tension, mood/affect, sleep patterns , attention span	
Cognitive changes	Sense of self/identify , self esteem , sense of belonging	

Table 1: Greenspace causal chain (combined causal chain developed from two models emerging from the MH&W workshop)

Aspects in grey have not been considered in detail as yet

DPSEEA chains	Specific link in the chain	Actions
Effect	<p>Children aged under 9 years</p> <p>Levels of wellbeing</p> <p>Weight</p> <p>Physical development and fitness (coordination, dexterity, etc)</p> <p>Socialisation (with other children and between children and adults)</p>	
Context	<p>Weather</p> <p>Parent's perception of safety</p> <p>Socio-economic</p> <p>Behavioural</p> <p>Resilience</p> <p>Physical function</p> <p>Transport</p> <p>Culture</p>	

Table 2: Sound (originally titled Noise in the MH&W workshops)

DPSEEA chains	Specific link in the chain	Actions
	<p>Two pressures and their drivers were discussed in relation to sound – noise from neighbours of people outside dwellings; and dwellings with poor sound insulation.</p> <p>When these were combined they resulted in dwellings with noise levels perceived to be unacceptable by their residents.</p>	
	<p>Sounds from motor vehicle traffic</p> <p>Sounds from construction related activities (roads, houses/flats, etc)</p>	
1a	Sounds from neighbours/people on street	
1b	Sound insulation in housing	
Drivers		
1a	<p>Rented housing policy – short term leases and population churn</p> <p>Cultural/national differences in acceptability of noise levels</p> <p>Migration policy – increasing levels of migrants</p> <p>Lifestyles – use of drugs and alcohol</p> <p>Lifestyles – parties and late night music/noise</p> <p>Buy to let mortgages</p> <p>Sport</p>	
1b	Housing construction policy – noise insulation levels (current and historical)	
Pressures		
1a	High noise levels from neighbours or people outside dwellings at times perceived to be inappropriate	
1b	Housing built with poor sound insulation	
State		

Table 2: Sound (originally titled Noise in the MH&W workshops)

DPSEEA chains	Specific link in the chain	Actions
	<p>Sounds heard within dwellings that are considered by children to be unacceptable noise</p> <p>Level</p> <p>Type/Characteristic</p> <p>Predictability</p> <p>Time</p> <p>Location</p> <p>Controllability</p> <p>Meaning/symbolism</p>	
Exposure	<p>Sound</p> <p>Waking</p> <p>Sleeping</p>	
Effect	<p>Effects on wellbeing</p> <p>Learning</p> <p>Tiredness from sleep disturbance/frustration/irritation</p>	
Context	<p>Tolerance to sound</p> <p>Accommodation to sound</p> <p>Culture</p>	

7 Preliminary high level findings

This section provides brief overview of the findings to date from existing reviews and reports on adult and child mental health and wellbeing.

Overall, the review literature in this area – mental health and wellbeing and the physical environment - is small. The majority of studies identified by these reviews have looked at the implications of the physical environment for adult mental health and wellbeing. There is increasing research on some aspects of the physical environment and children’s mental health and wellbeing, e.g. natural environment, greenspace, woodland, parks, etc. but many of these are ongoing. In addition many of the studies that have been undertaken have been cross-sectional. These issues are the major limitations in assessing the significance and influence of the physical environment on mental health and wellbeing in general and specifically in relation to children aged 9 years and under.

The key reviews we identified are:

- The effect of the physical environment on mental wellbeing, State of Science Review SR-DR2, Mental capital and Wellbeing Foresight Report. 2008.
- The urban environment, Royal Commission on Environment and Pollution. 2007.
- A systematic review on the effect of the built and physical environment on mental health. Mental Health Foundation. 2006.

The central insight of the Foresight State of Science report and one that has an important bearing on this case study is that the main factors contributing to mental wellbeing relate strongly to sensory stimulation, that is, what we see, smell, touch, taste and hear. The three main aspects of the physical environment, emerging from the literature review, and their influence on mental health and wellbeing in adults and children are:

The quality of the fabric of the physical environment

This includes the design and construction of buildings, the spaces between buildings (e.g. parks) and associated infrastructure as well as the maintenance and regeneration of spaces and places. The quality of the physical environment also can be viewed at different scales, from neighbourhood/locality, district and city/town.

The quality of the ambient environment

This includes, for instance, acoustics, lighting and air quality as well as temperature, colour, ventilation, humidity, access to nature, having views of nature, natural sunlight and having plants in offices and homes.

The psychological impact of the physical and ambient environment.

This includes our perceptions of density and crowding, sense of safety and fear and way-finding. Again, access to nature, having views of nature and natural sunlight and having plants in offices and homes also significantly contribute to our psychological relationship with the physical environment and, consequently, to our mental capital and wellbeing.

The State of Science Report as part of the overall Foresight Report on Mental Capital and Wellbeing uses seven types of physical environments to consider health and wellbeing effects which are as follows:

The physical aspects of:

- Dwellings (houses, detached houses, semi-detached houses, flats or apartments, high-rises, low-rises, single-family, multi-family etc.)
- Neighbourhoods
- Natural spaces (i.e. green space)
- Educational settings (schools, universities, day care facilities)
- Workplaces (offices, factories, shops)³⁶
- Healthcare settings (hospitals, care homes, care units etc)

This is similar to the categories developed by the Mental Health Foundation. In contrast the RCEP have categorised the major physical environment factors as:

- Air pollution
- Climate
- Urban buildings
- Water and flooding
- Noise
- Infectious diseases
- Urbanisation
- Green spaces

The high level findings of this case study's literature review will be framed within the seven categories used by the Foresight State of Science Report, the first three of which are the most predominant in the literature.

Housing quality

Overall, poor housing quality can lead to poorer mental health. Housing quality is defined as dry (no damp or condensation), comfortable temperature depending on the season (not cold or too warm), good natural lighting, space, well maintained, indoor air quality, etc. The more problems with housing for adults and children the greater the likelihood of psychological distress. The key mental illnesses associated with poor housing are depression and anxiety.

Individuals, adults and children, living in **high rise buildings**, particularly in poorer housing areas, can also suffer from significantly higher levels of mental health problems. This seems to relate to feeling more isolated and alone the higher up a high rise building you live.

³⁶ This could be considered a potential factor in terms of preconception influences/exposures.

Similarly, individuals living in **high household density**³⁷ dwellings (i.e. overcrowded conditions), particularly when the other people in the household are not family, experience higher levels of mental ill health. For children, having their own space for play and doing their school homework; design that minimises uncontrollable social interactions and floor plan layouts that provide better room separation/more interconnected spaces (more depth) are important in mitigating the effects of high household density.

Neighbourhood quality

Similar to housing, poor neighbourhood quality also adversely affects mental health and wellbeing. The key physical aspects of the neighbourhood are: number of derelict buildings, cleanliness of the streets; incidences of graffiti, and other forms of neighbourhood level physical disorder.

It is currently unclear what impact travelling through other neighbourhoods has on adult and child mental health and wellbeing.

High urbanicity (i.e. population/community density) living is also associated with poorer mental health and increased risk of mental illness.

Noise, unwanted sound that causes annoyance, is associated with poorer quality of life and in the case of children poorer cognitive development. Airport noise is seen as having a particularly detrimental effect.

Green and open spaces

Having access, either as a view or through interactions with gardens, play areas, parks and natural areas is associated with better mental health for both adults and children.

Contextual factors examined

- Neighbourhood level social disorder: greater levels of neighbourhood violence, witnessed or experienced, in adults and children leads to poorer mental health and wellbeing.
- Housing tenure: mixed and unclear findings, insecure tenancy can adversely affect mental health and wellbeing.
- Sense of belonging to the community: a sense of belonging is positively associated with mental health and wellbeing.

Additive/synergistic effects

All the above have additive and/or synergistic effects which can amplify their effects on mental health and wellbeing at individual, household and community levels.

³⁷ The use of the term density i.e. the number of people living per unit of space is seen to be more objective than overcrowded which is seen to be a perceived and subjective aspect and is likely to differ depending on social or cultural context.

8 Community engagement

We are currently exploring how best to engage children and parents and how we can bring them into this case study and the project as a whole.

There is ongoing literature review work as part of the programme to develop children and young people's mental health and wellbeing indicators which will examine children and young people's understandings of the factors that influence their health and wellbeing.

As there are resource constraints our approach to this element is likely to change however one approach we are seriously considering is to explore ideas of what might make children happy/sad in their neighbourhoods in which they live and play using fun activities in order to explore the connections which children (and parents) make between their mental health and wellbeing and the physical environments they inhabit.

9 Discussion

This area is highly complex and unpicking the impact of physical aspects of the environment from the social aspects and the interactions between them and mental wellbeing requires a thorough understanding of the processes involved.

Current thinking is that it is likely that the social environment, especially for children, will have the greater impact on their mental health and wellbeing and that the physical environment is likely to play an important and significant enabling role in creating/supporting social environments that are conducive to mental health and wellbeing.

Housing and neighbourhood (including greenspace) design and maintenance seem to important aspects of the physical environment that influence mental health and wellbeing in children.

While we know something about each of these aspects of the physical environment, the evidence is much less and more uncertain on the interaction between them.

10 Forward Plan

The Mental Health and Wellbeing Case Study forward plan to March 2010 is to:

1. Refine and develop a holistic DPSEEA model and causal chains/lists working closely with NHS Scotland (Sheila Beck) and her forward plan of workshops on mental health and wellbeing.
2. Synthesise the existing evidence base by going through the literature identified in existing reviews and where necessary conduct an additional literature review taking into account the last two years and a focus on children. This includes evidence on the effectiveness of policy interventions.
3. Identify associations that can be quantified and incorporating them into the emerging DPSEEA model and causal chains/lists.
4. Identify one or more mental health and wellbeing specialists with expertise in children's mental health and wellbeing and the role of the physical environment to help inform and advise on the work of the case study.
5. Assess the implications for data sources and some investigations with existing datasets in relation to MH&W issues in Scotland.
6. Assessing the implications of the case study and the refined DPSEEA model and causal chains/lists for Scottish policy and decision-making on the physical environment.

Key outputs for Mar 2010 are linked papers that will form one main report on:

1. Review of the literature.
2. The refined set of DPSEEA models and causal chains/lists.

Key outputs for Mar 2011 are reports/papers that will form one main report building on the work in 2010:

1. Feasibility of quantification of causal chains/associations and the current relevant datasets in relation to MH&W issues.
2. Implications for policy and decision-making on the physical environment.

Appendix: Current collected literature as of April 2009

Environment and neighbourhood

1. Wellbeing and environment - NEF WWF UK - 2005
2. Better environment healthier people - EA England - 2005
3. Building health creating and enhancing places for healthy active lives - NHF LS CABE England - 2007
4. Built environment and health inequalities report - SRHIE DH England - 2009
5. Built environment and health inequalities summary - SRHIE DH England - 2009
6. Can I play out lessons from London Play's Home Zones project - London Play England - 2007
7. Child wellbeing and neighbourhood quality - DU USA - 1999
8. Do poorer people have poorer access to local resources and facilities - SSM oa - 2008
9. Does gentrification help or harm neighbourhoods - ESRC CNR England - 2002
10. Does the built environment influence physical activity examining the evidence - TRB IMNA USA - 2005
11. Effect of built and physical environment on mental health a systematic review - MHF UK - 2006
12. Effect of the physical environment on mental wellbeing SR-DR2 - Foresight - 2008
13. Environment and health report no 10 - EEA EU - 2005
14. Environmental exclusion review research report 11 - ODPM England - 2004
15. Graffiti, greenery and obesity in adults - BMJ - 2007
16. Health and the physical characteristics of urban neighbourhoods literature review - GCPH - 2007
17. Health impacts of the built environment a review - IPHI Ireland - 2006
18. Healthy places exploring the evidence - AJPH - 2003
19. Healthy sustainable communities what works - NHS MKMS England - 2004
20. Healthy wealthy and wise creating the right environment - RSPB - 2006
21. Knowing health and wellbeing outcomes of regeneration presentation - Knowfife Scotland - 2008
22. Markets as sites for social interaction spaces for diversity - JRF England - 2006
23. Multidimensional neighbourhoods and health paper No 19 - ESRC CNR - 2007
24. Neighbourhood characteristics and depression - PMC - 2008
25. Neighbourhoods and adolescent development - PUP USA - 204
26. Noise and health making the link - LHC England - 2003
27. Observed neighbourhood characteristics and child safety and wellbeing -CU USA - 2007
28. Physical activity and the built environment presentation - APA USA - 2002
29. Physical activity and the built environment - CABE England - 2006
30. Promoting and creating built or natural environments that encourage and support physical activity - NICE UK - 2008
31. Public space social relations and wellbeing in E London - JRF England - 2006
32. Relationship between the built environment and wellbeing literature review - VHPF Australia - 2000
33. Significance of neighbourhood context to child and adolescent health and wellbeing - SJPH - 2006
34. SUEWH Benefits of urban living - RCEP UK - 2005

35. SUEWH Urban environments literature overview - RCEP UK - 2005
36. UUEWH seminar - RCEP UK - 2004
37. Urban Environment Report - RCEP UK - 2007
38. Urban Environment Report presentation - RCEP UK - 2007
39. Urban Environment Report summary - RCEP UK - 2007
40. Urban environments and health - GU QSQH Australia - 2006

Greenspace

1. Wellbeing and the natural environment review - UB England - 2007
2. All things to all people parks and seminatural spaces in 21st century Britain - MAB - 2002
3. Central Park Life Centre literature review - PPCT England - 2006
4. Central Park Life Centre literature review appraisal - LHO England - 2006
5. Children in the outdoors a literature review - SDRRC England - 2009
6. Economic benefits of accessible green spaces for physical and mental health scoping - FC England - 2005
7. Ecotherapy the green agenda for the mind exec summary - MIND England - 2007
8. Effectiveness of greening of urban areas in reducing ozone UV and heat - DRAFT - 2009
9. Greenspace and quality of life literature review - GS Scotland - 2008
10. Health and wellbeing trees woodlands and natural spaces - FC WAG England - 2003
11. Health impacts of greenspace a guide - GS HS SNH IOM Scotland - 2008
12. Health place and nature - SDC England - 2008
13. Health place and nature presentation - SDC England - 2008
14. Innovative approaches to research excellence in landscape and health conference - OPPS Scotland - 2007
15. Links between greenspace and health a review - GS Scotland - 2008
16. Links between greenspace and health a review - GS Scotland - 2008
17. Natural thinking links between natural environment, biodiversity and mental health - RSPB - 2007
18. Nature and health part 1 review - HCN RMNO Netherlands - 2007
19. Physical activity and the environment transport evidence review summary - NICE England - 2006
20. SUEWH Urban nature - RCEP UK - 2005
21. Top 10 evidence sources on environment and health - - 2007
22. Wellbeing and the natural environment review - UB England - 2007

Mental health and wellbeing and children and young people

1. Social determinants of mental disorders - 2009
2. What do we mean by wellbeing and why it might matter - DCSF 2008
3. Adjusting to life circumstances mental health resilience and inequalities presentation - AWMHPNC Wales - 2008
4. An overview of child wellbeing in rich countries Report Card 7 - UNICEF - 2007
5. Effect of built and physical environment on mental health a systematic review - MHF UK - 2006
6. Effect of the physical environment on mental wellbeing SR-DR2 - Foresight - 2008

7. Improving public mental health emerging theory practice - - 2009
8. Investigating the links between mental health and behaviour in schools - SE Scotland - 2005
9. Mental capital in times of crisis roundtable presentation - EU - 2009
10. Mental health continuum from languishing to flourishing in life - HBR - 2002
11. Mental health improvement concepts and definitions - SE Scotland - 2006
12. Mental health improvement evidence based messages to promote wellbeing - NHSS Scotland - 2007
13. Mental health resilience and inequalities - WHO - 2009
14. Mentally health communities a collection of papers - CIHI Canada - 2008
15. Modernity's paradox and the structural determinants of child wellbeing - HSR - 2008
16. National accounts of wellbeing - NEF UK - 2009
17. Social cohesion income deprivation and common mental disorder –

Housing

1. What is the impact of housing conditions on the health and wellbeing of children - SCIE England - 2005
2. Effects of housing on neighbourhood crowding on children's wellbeing - UoC USA -
3. Good housing and good health review and recommendations - HC England - 2008
4. Good housing leads to good health a toolkit for environmental health practitioners - CIEH England - 2008
5. Health impact of housing improvements incorporating the evidence - JECH - 2006
6. HIA of housing improvements a guide - HS MRC Scotland - 2003
7. Homelessness and health review - DHSC England - 1999
8. Housing and health building for the future - BMA UK - 2003
9. Housing and public health review of reviews of interventions - NICE England - 2005
10. Housing and the built environment rapid review exec summary - DHSC England - 1999
11. Housing improvement and health gain summary and systematic review - MRC SPHSU Scotland - 2005
12. How housing affects child wellbeing - FNSGLG USA - 2006
13. Impact of housing conditions on health - SMBC England - 2005
14. Is housing improvement a potential health improvement strategy - WHO - 2005
15. Poor housing and mental health in the UK - JEHR CIEH UK - 2002
16. Reducing the environmental impact of housing - RCEP UK - 2007

Mental health indicators

1. C&YP Mental Health Indicators Background Briefing - May 2009 Final
2. Children and young Peoples mental health indicators - SG Scotland
3. Establishing Scottish mental health indicators - SE Scotland - 2007
4. Mental health indicator rationale paper
5. National adult mental health and wellbeing indicators briefing - 2007
6. PHINS Bulletin No 9 (Jan 09)