

What is needed to deliver places that provide good health to children?



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Executive Summary

This review includes academic literature and relevant government and NGO reports. Britain ranks low among developed countries on child wellbeing; obesity rates are substantial and children are overrepresented among the poorest households (1-2). It has been argued that positive social and physical environments have the potential to enhance children's wellbeing and, through promoting physical activity and good diet, they can also reduce obesity and improve physical health. Children spend most of their time in the home or at school but they have the most potential to be physically active in their local neighbourhood and its green spaces.

Healthy places for children have a healthy social environment in terms of

- **Security** through social cohesion: positive norms of looking out for each other, helping out and opportunities to experience positive interactions with other children and adults (3-4)
- **Control**, within limits, over their own activities (5-6)
- Children feeling they are **valued** and that their opinions on changes and developments will be taken into account. Then they in turn are more likely to show respect for people and property (1).

Healthy green spaces for children need to

- have **facilities** to encourage physical exercise such as trails, playgrounds for younger children and open spaces for older children. An aesthetic appeal is desirable but for children the green space needs to be designed to enable play (1, 7-9).
- be designed to be perceived as **safe so that adults will allow children to play** through:
 - maximum **view**. Younger children need places where they can interact with adults but also places where adults can watch discreetly so that children can develop their own agenda (6).
 - spaces for **teenagers** and young people to congregate without being seen as a threat (1, 4)

What can be done to improve disadvantaged neighbourhoods so that they are better for children's wellbeing?

- design to maximise the chances of social bonds forming through
 - including focal points and **meeting places** such as village halls(10)
 - restricting household **density** (1, 11)
 - providing community **activities** (12)
- good quality local **green** spaces- children often can't access facilities further afield (13)
- effective and timely **maintenance** (1)
- approachable **personnel** to keep an eye (10)

Paradoxes which need to be resolved to produce healthy neighbourhoods for children:

- access to resources is not strongly related to health and wellbeing but walkability is, (14-15)
- car availability provides access to more health promoting resources yet reduces active transport (12, 15)
- high density living is conducive to active transport and sustainability but weakens social bonds and reduces neighbourhood play spaces (1)

Introduction

This paper is a review of academic literature and relevant government and NGO reports. To start with we provide some background on what, in general terms, children need to be healthy before introducing why the environment might be important. We bear in mind the modified Driver Pressure State Environmental Exposure Effect Action model for linking environment and health (16a)(figure 1).

What do children need for good health and wellbeing?

Children's needs are social and physical. Here we look at four needs of children: health (in particular healthy BMI), equality, social bonds and security.

In Scotland the current 'Getting it right for every child' programme (17) has eight indicators of children's wellbeing: a child should be safe, healthy, achieving, nurtured, active, respected, responsible and included. Similarly the, now obsolete, English 'Every Child Matters' programme (18-19) had explicit objectives for children which related to their health and wellbeing: children should be able to be healthy, stay safe, enjoy and achieve and make a positive contribution. As it stands, much research in this area has so far focussed on health and activity, particularly in the maintenance of a healthy BMI. There is a reason for this focus: in the UK 20% of 4 year olds and 15% of 15 year olds are obese (1) and in Scotland 27% children aged between 2 and 15 are outwith the healthy weight range (20). This is partly the result of physical inactivity (21). Although it is unclear the amount of physical activity needed to improve health, it is apparent that many children are undertaking less exercise than is needed (1, 5, 22). Thus, preventing the obesity epidemic has been a focus for research.

In addition to physical health children also need emotional wellbeing. The UNICEF report on child wellbeing in rich countries suggests that:

“The true measure of a nation's standing is how well it attends to its children – their health and safety, their material security, their education and socialization, and their sense of being loved, valued, and included in the families and societies into which they are born.” (2)

The UK was ranked overall lowest in terms of child wellbeing. One aspect in which the UK ranks particularly poorly is material wellbeing. In Britain, 13.4 million have incomes below 60% of the median average income and of these 53% are in households with children (23). In Scotland 210,000 children are in relative poverty (24). Although this ranking is a measure of relative poverty rather absolute poverty (2), in the poorest fifth of households around 15% parents cannot afford for their children to have a friend around for tea once a fortnight, a school trip once a term or a hobby or leisure activity (23). Thus poor children can be unable to participate in activities which might preserve or improve their wellbeing and which could provide them with social connections. In the UNICEF report, the UK ranked bottom on family and peer relationships, particularly viewing peers as kind and helpful, and on risky behaviours, especially underage drinking and sex (2). These measures indicate that many UK children have problems with social connections and feeling secure.

Feeling secure is an important underpinning of being able to reach one's full potential (25) and is linked to feeling safe from harm by others, feeling in control and being valued by others (26). These are themes to which we will return in this report. Note that rather than objective safety, it is the perception of security that leads to action by individuals and authorities (12). These themes resonate with the 'Getting it right for every child' objectives of staying safe, being included, respected and nurtured. The Scottish Government framework for the early years (27) suggests that a secure childhood will build resilience, enabling a child to better cope with life's challenges. Lack

of security and resilience increase the chances of engaging in risky behaviours and reduce the chances of health promoting behaviour patterns being established (28-29).

As well as having consequences for mental health, poor emotional health can affect physical health. Exaggerated fears about child stranger abduction mean less than half of British children walk to school (30). In a YouGov poll of British parents with a child at primary school, 30% parents reported that their main worry was their child being abducted by a stranger. Child abductions actually occur at a rate of about one in a million. Only 5% parents were most strongly worried that their child was not getting enough physical exercise, despite high obesity rates (30-31). Through this illustration we begin to see why both the social and physical environments might be important in determining health and behaviour; worries about 'strangers' impact upon children's use of the environment in terms of walking to school. Furthermore, current government physical activity guidelines for schools are for children to spend two hours per week being physically active (1) yet, ideally, seven hours per week are needed (32). Places outside school are thus needed to provide children with realised opportunities for physical activity. We now consider theoretically why it is important to consider place when thinking about children's health and wellbeing.

Environment and health: why, what and how

In this section we consider why the environment is important, what the environment is and how it can be operationalised. There is increasing emphasis on thinking about health and the environment through the concept of 'place'. What does place offer the policy maker and practitioner concerned with public health and the health of children in particular?

We now recognise the complex, inter-linking and multifaceted set of influences on health; people's social, economic, cultural and environmental circumstances all conspire to raise or lower their chances of good or poor health. It is also useful to recognise that, in broad terms, the quality of each of these circumstances tend to be related; people in adverse economic situations often also face difficult social circumstances for example. *Place* is the term used to bring together the social, economic, physical, cultural, and historical characteristics of a location; place is the part of people's life circumstances which is related to *where* they are.

To recognise the importance of place for public health however, it's important to see places as more than just a collective noun for the multiple characteristics of where people live and work; *places shape and influence people's lives*. Consider the analogy of a garden or a field; seeds planted in ground which is stony, nutrient-poor, weed-choked, lacks sunlight and water and which are ignored rather than tended will find it hard to thrive, grow weak and yield little. Seeds in fertile soil, with good light and which are well tended with thrive and yield plenty. We can consider the qualities of places in the same way (and here the importance of place for children is emphasised); poor quality places hinder and inhibit the chances of a long, healthy and successful life. Children who grow up in adverse places are more likely to have problematic adult lives. Then, since our social, economic and housing systems tend to group similar sorts of people together in neighbourhoods, such adults contribute to reproducing adverse places through their own social, economic and behavioural problems. 'Good' places are more likely to produce healthy, happy, productive people (who, in turn, collectively reproduce good places). Place is thus the site and system by which society, economy and health gets reproduced, generation to generation.

By broadening our definition of environment to 'place', we recognise the interactions between social, economic, cultural and physical environments and can plan for each component to be a positive influence on the health of children now, and as future adults.

How should the environment or ‘place’ be operationalised for establishing connections with health and wellbeing? This is difficult because children encounter multiple environments in time (e.g. home, school and neighbourhood) and exist at multiple spatial scales (e.g. home neighbourhood, region and country); there are also multiple types of environment (e.g. physical, built, policy and social) (33); it is thus possible that a child could be experiencing both health damaging and health promoting environments so the relative influence of each would need to be ascertained (34). Furthermore, there may be time lags before environmental conditions begin to influence health and associations may be context or country specific (33-34).

Bronfenbrenner developed an ecological model to show how different environments affect a child’s development (see figure 2). Children exist in microenvironments such as their home and school. They are also affected by other environments which they do not enter themselves, such as their parents’ workplace, or pubs frequented by their parents (exoenvironments) and also by society wide conditions (macroenvironments). One of the strengths of Bronfenbrenner’s work is that he notes the importance of social ties within and between environments in creating desirable outcomes and the ability to transition successfully from one role to another – different roles invariably involve different social expectations (35). This model is currently being used in research into childhood obesity community interventions and the relationship between the built environment and physical activity, although it is interpreted in quite different ways: a neighbourhood was conceived an exo environment in one study but in another was described as having macro and micro environmental elements (36-37).

Children spend most of their time in the home or at school but they are most likely to be physically active elsewhere – in green spaces and in their neighbourhood. The environments that we chiefly focus on in this paper are neighbourhoods and green spaces within them. These are sometimes termed the ‘fourth environment’ (4). Defining a neighbourhood physically as well as theoretically is not straightforward. Often data are only available for administrative areas, which may or may not be related to personal understanding of the local area or children’s real activity space. Alternatively, GIS can be used to measure and assess facilities and environments within a particular distance from a residence; however there is no consensus on the correct distance to use – age and access to transport complicate things further (33, 38).

Macintyre and Ellaway have identified context and composition elements of the neighbourhood (13). Composition effects are features of the population of the neighbourhood; the neighbourhood unemployment rate, for example, is the proportion of individual inhabitants who are unemployed whereas context effects are features of the environment which are not averages of the people who live there. Studies that attempted to distinguish contextual effects from composition effects consistently found a modest area affect on health (39) and physical activity (8).

When thinking about how and why health and behaviour seem to vary between populations of different places, we often think in terms of the ‘context’, or characteristics of the place, and the ‘composition’, or characteristics of the people who live there. The boundary between ‘context’ and composition is ambiguous; in many ways they are interdependent (13). A pleasant environment (for example a beach) may lead to high property values, meaning only affluent individuals, who tend to be healthier, can live nearby. The lobbying power of wealthy individuals may also lead to enhanced environments, as local governments are pressurised into cleaning up or maintaining environments for example. Many place researchers have moved beyond thinking about place as a dichotomy between context or composition. Macintyre and Ellaway, for example, moved on to consider material and collective aspects of neighbourhoods that can improve health. Material

aspects include physical features, healthy environments at home, work and play and services provided. Collective aspects include the socio-cultural environment and the reputation of the area. Collective norms may need changing to improve health. For example, if smoking is generally frowned upon, there is more pressure on smokers not to light up while walking through the neighbourhood (13). Collective aspects also include social cohesion and social capital (3). The influence of the social environment on health and behaviour has been rather less studied than the physical environment which is easier to measure (33). Similarly there have been more studies of physical health rather than the more subjective wellbeing.

Wellbeing is difficult to assess: self reported measurement of even behaviour changes are prone to significant measurement error (40) so reporting of something less tangible accurately is likely to be difficult. Terms such as 'quality of life' are not well defined and professionals may conceive of these differently to lay people (5).

So far we have established that children need a healthy BMI and emotional wellbeing which can be created by reducing inequalities, enhancing social connections and security. Exploring place may enable us to improve children's wellbeing. Place, which can be difficult to measure, has social and physical elements which are interdependent. The most deprived neighbourhoods are most likely to have poorer physical and social environments (41).

In this report we seek to examine social and physical aspects of green spaces and neighbourhoods which can contribute to child wellbeing. These reflect the Scottish Ministerial Task Force on Health Inequalities, which notes that physical environments affect physical health and wellbeing and play spaces for children should have a high priority (42), and the Marmot Report on English health inequalities which suggests that healthy and sustainable places can be developed by improving the availability of good quality green space, active travel and the food environment in local areas (41). We also consider the, less studied, social environment. Relationships between the environment, health inequalities, social connectedness and feelings of security are considered throughout and we make suggestions as to how these concepts link to the modified DPSEEA model. Due to a lack of literature specifically on children and place, studies involving adults are also included where relevant. To end we discuss theoretical development and other linked areas such as housing, pollution and sustainability.

Healthy green spaces for children

Related mDPSEEA elements:

Drivers: Culture, State: neighbourhood, natural space, Exposure: green space, Effect: wellbeing

The natural environment has been termed a 'health service' (43). Scottish programmes to reduce inequalities specifically mention the importance of access to safe places to go, chances to exercise and spaces to play (24, 27, 42). The availability of green spaces such as woodlands and gardens, which provide biodiversity has been explicitly linked to the Every Child Matters objectives of being healthy, staying safe, enjoy and achieve and make a positive contribution (44). In this section we detail how green spaces can encourage physical activity and enhance wellbeing. We then note that green spaces with certain features may be more likely to produce these desired affects and lastly examine barriers to green space use and being able to derive the desired effects of increased physical activity and wellbeing.

Green space and physical health

Evidence suggests that physical activity is generally higher in green spaces and BMI in children is lower when they have access to more green space (10, 45-46). The Marmot report advocates that there should be green space within four minutes of every family home (10).

Green space and wellbeing

Psychological studies have shown that even viewing natural spaces can improve illness symptoms and wellbeing. Having contact with nature has other benefits too, such as enhanced mental and spiritual health, enhanced cognitive processes and stress reduction, alleviation of depression and reduced substance including tobacco smoking (5-6, 44). Benefits have been found for children: children like natural places to relax after a stressful event, ADHD symptoms reduce and concentration in all children can be enhanced (11-12). Thus natural elements are consequently being introduced into more urban children's play areas (45).

The aesthetic experience of green space has also been examined in children (5). The impact of this tends to vary with age: children are most positive towards naturalistic spaces and teenagers the least (47). In a Scottish study, enhancing security and dealing with pollution were judged to be more important than aesthetics (48).

Wellbeing may also be enhanced indirectly by green spaces via their potential to foster social contact, and the improved social and communication skills this can bring. It has been argued that social contact in green spaces promotes language development, social skills of negotiation and listening, friendship development and responsibility more effectively than in other environments (6). If these skills are well developed during childhood, they are likely to be helpful later on in life in the world of work.

Activities in green spaces may also bring feelings of personal control (5) through improved self esteem and self efficacy, ability for goal setting, development of practical skills, ability to realistically appraise risks and acquisition of problem solving and presentation skills. Such skills lead to confidence about facing uncertainty through development of flexibility and adaptability to changing surrounding (6). Feelings of control are likely to be enhanced if local children and young people participate in the design of local green space; the sense of control and ownership this may provide can also reduce the chances of subsequent vandalism (1).

Physical activity is likely to improve wellbeing regardless of the environment in which it takes places, but being in nature has been identified as a key motivating force in being active (6, 44). Given the independent effects of green spaces on wellbeing, it is possible that physical activity in green spaces is particularly good for wellbeing. A UK meta analysis found that activity in green space was most beneficial for wellbeing when the activity was carried out in short bursts and it was particularly helpful for younger people and the mentally fragile (43). However none of these studies were high quality designs (49).

In general, however, the evidence base for effects and mechanisms of the influence of green space on children's health and wellbeing is deficient in range and quality (12). GIS studies of availability of any sort of green space have sometimes but not always been found to green space to be related to BMI and physical exercise (50-52). This is likely to be due to the quality and function of green space to being important in encouraging exercise.

Will any green space do?

The extent to which green spaces are used for physical activity is likely to vary by space type, any local rules or policies encouraging or prohibiting physical activity, and available equipment (53-54). Aspects that are associated with more physical activity include features and facilities for exercise (especially trails) rather than general amenities and aesthetics. Evidence is less clear on whether accessibility, size and security are helpful (7-8, 10). Currently however, many UK parks are poorly maintained and do not facilitate play. Furthermore, if poor green spaces are sold, proceeds are often not ring fenced into creating new play spaces. Maintenance costs have been cut and new parks are often poor quality; often money that is spent is used for playgrounds when older children would prefer space to play football and don't use equipment (1). Play areas for children should be thought about in terms of their functions or 'affordances' rather than their form; for example whether a tree is helpful depends on whether it can be climbed on, used as a lookout etc.(9). Thus green spaces in the UK may not be reaching their potential for encouraging increases in physical activity and wellbeing.

The quality of green spaces is also important for the extent of wellbeing enhancement. In a Scottish study, respondents who assessed their local green space as being good quality had higher life satisfaction, greater social trust and a higher sense of community cohesion and good self assessed health (48).

In the current policy paradigm green space is seen entirely as beneficial. However such places can also be hazardous to health: allergies can be triggered and ticks, for example, can cause Lyme's disease (5). Even if good green spaces exist, it is not necessarily the case that people will use them for physical activity. They may lack confidence or they may be unable to prioritise spending time in green space, or be put off by bad weather (6). Adult use of and benefit from green space is related to time spent in such environments as children (55). Familiar landscapes are often seen as more desirable, and the normalisation of being in such spaces which comes from repeated childhood visits, seems to carry into adulthood (47). Thus the importance of persuading parents to encourage their children to use green space is even more crucial.

It is thus not the case that any green space will lead to an increase in physical activity and wellbeing. Green spaces need to include features that will stimulate play and physical activity. Adults who have spent more time in green spaces as children are most likely to see the benefits of green space and use them.

Cultural influences on the likelihood of using green spaces

Whether children use green space and are able to reap the benefits in terms of wellbeing and physical activity depends on parental and wider societal pressures, including the extent to which they are allowed to follow their own desires and the extent to which cultural influences may turn them away from green spaces (45). In Britain, the media often provides negative perceptions of woodland and wilderness. There are now many more indoor weather-proof attractions and young Britons are more and more used to commercialised spaces (12), both of which may cause young people to devalue green space. Young people's interest in nature may consequently be fleeting and projects to help engage them in the natural world are needed (6). High value is placed on wealth and conspicuous consumption of expensive goods in British society (12). The natural environment is not valued in the same way as economic and material reward. This position is likely to have a damaging effect on wellbeing as a materialist orientation is associated with reduced wellbeing and placing a low value on spending time in green spaces means positive benefits of so doing will not be attained (12).

Attitude towards personal security is another factor which influences the chances that children will spend time in green spaces. Women in particular are more likely to experience fear and perceive green spaces as risky (47). Since it is more often women who take a lead role in activities for children, this is an important consideration. It is possible, through design, to make green spaces feel safer. Urban parks have been designed to provide maximum vision, through careful planting of trees and lighting and escape options (47-48).

There are large differences between ethnic groups in the rates of accessing green spaces. The extent to which a green environment is perceived as normal, or familiar is also likely to vary by ethnic background and immigrant status (47). Indeed, as the entire population becomes more urban and distanced from the natural environment, it may be that green spaces are increasingly unfamiliar, and perceived as risky. The skills needed to make the most of nature may be lost (6).

In the UNICEF report, the one area where the UK did not perform poorly was in accident rates (2). Although this is a positive achievement, many fear that it highlights that the UK population has become too concerned with preventing accidents: parents and teachers prevent children taking any risk which, in turn reduces their enjoyment of, and desire to spend time in, green spaces (6, 45). In addition to the desire to prevent children becoming hurt, the threat of litigation may be a factor (6). If children are only allowed to experience green space with adult supervision, it negates many of the perceived advantages of outdoor spaces in building self esteem and personal control.

Restricting children's freedom is not solely about protecting them; it is also about intolerance. Fear and intolerance of children has been documented for many centuries (1, 4, 56). Children and young people, particularly when gathered in groups, can be perceived as a threat. It has been argued that the creation of Anti Social Behaviour Orders (ASBOs) in the last decade legitimised this view. The 'answer' to the perceived threat posed by youngsters 'hanging round' is seen to be providing structured activities, which have been found to reduce antisocial behaviour, but the most effective development and enhancement of wellbeing is likely to occur when children find things out for themselves (1, 6). Young people like to use green environments to create their own spaces and territory. However, this can prevent other potential users being feeling comfortable in the space (6). To prevent this, other users may attempt to restrict access to young people (1, 6). Younger children need to experience the social and natural environment with adults to learn behaviour that is acceptable (57). By excluding children, or seeing them as a problem, green space is no longer public space; it becomes reserved for adults (4, 58). Thus the issues of security, green space and children are not straightforward. The extent to which children are threatened or a threat is ambiguous. Improving the social environment, in particular social ties between different population groups is likely to increase understanding and empathy and reduce feelings of threat both from and towards young people.

Inequalities' influences on the likelihood of using green spaces

Socio-economic circumstances can influence the use of green spaces. Socio-economic barriers to use include lack of money to use available facilities, lack of transport, safety concerns and the poorer quality environments in more deprived areas (5). Yet structured activities in green space have been found to have a particularly positive affect for disadvantaged children (6). The Marmot report found a significant lack of green space and play spaces for children in disadvantaged areas (10). Only 53% of people in the most deprived areas of Scotland live within a 5-minute walk of their local green space for example, compared with 67% of people in the least deprived areas of Scotland. People are more likely to visit their local green space if it is closer (48). Green spaces which do exist in disadvantaged areas are more likely to be poorly kept and to be perceived as

unsafe (5). Children's enjoyment and play value of local green spaces is likely to be compromised by other users leaving dog faeces and drug paraphernalia (56). Furthermore, open spaces in social housing estates are often not categorised as 'public space' and so are exempt from legally binding upkeep requirements (1, 13, 59).

In summary, not all green spaces are the same; the design and configuration of some spaces may be more appropriate for increasing physical activity and wellbeing. Design and maintenance has a strong influence on perceptions of safety. Various aspects of British society and culture reduce the potential ability of green spaces to improve wellbeing, and these include perceiving children in these spaces as both threatened and a threat. Good quality green spaces are least likely to be found in disadvantaged areas which are just the locality where they are most needed.

Economic benefits of green spaces

In the current 'age of austerity', public spending needs good justification. There are economic benefits of (particularly attractive) green spaces. Attractive and amenity-filled areas may be more attractive to new employers and, in turn, employees working in such areas may be more productive (5). Of course the opposite may also occur; potential employers may be priced out of, or restricted by planning rules in, attractive areas. In addition, incentives may be provided to encourage businesses to open in less attractive areas (60).

High quality green spaces can also generate economic benefits in their own right, drawing visitors to an area and the money they spend. The health benefits they may foster also have economic impacts. Physical inactivity currently costs the NHS around £1 billion annually and between £2.3 and £2.6 billion to the economy annually (1). The costs of poor mental health are vast too. When green spaces help people stay healthy, there is a reduction in cost to both health and social services. Green spaces also provide environmental benefits which saves money on flood defences, water conservation, pollution cleansing and preserving biodiversity. They may also reduce heat stress by decreasing local air temperatures (5). These things may also have long term cost savings in terms of sustainability and reduced use of health services.

Engaging activities in green spaces may help young people develop skills which are desirable in the workforce whilst at the same time reducing antisocial behaviours. The latter is significant in its potential to reduce local expenditure on dealing with vandalism and other antisocial problems. Furthermore, experiencing nature tends to engender the desire to spend more time in green spaces which can create opportunities for tourism and leisure businesses (6).

Thus spending money on green spaces can be justified in making areas more desirable, saving money by prevention of environmental problems, increasing the skills and work aptitude of the workforce and enhancing opportunities for leisure employment. This is in addition to money saved by health services from greater physical activity and wellbeing.

Summary – what are healthy green spaces for children?

Good green spaces for children have a diversity of environments, activities and attractions, and children are able and allowed to access them (61). Healthy green spaces should contain facilities to encourage physical exercise such as trails, playgrounds for younger children and open spaces for older children. Although aesthetics can be important, from a child's perspective, the green space needs to be designed to enable play. Most importantly, the space needs to be seen to be safe. This can be done through design allowing maximum view, although if taken to extremes this can reduce affordances for play. For younger children, there needs to be places where they can interact with

adults but also places where adults can watch discreetly so that children can develop their own activities. Spaces where teenagers and young people can congregate without being seen as a threat need to be specifically and carefully designed so that they do not impede the enjoyment of other users. Green spaces are most likely to provide health benefits if children and young people are involved in their design and feel that they have some control and thus ownership. It is thus that only by understanding the social environment that the physical environment can be optimised.

Healthy neighbourhoods for children

Related mDPSEEA elements:

Drivers: Population change, Culture, State: neighbourhood, retail environment, Exposure: green space, Effect: wellbeing

The wider neighbourhood environment also appears to have some influence on health and wellbeing for children. We first discuss the physical environment (access to resources (particularly food), design relating to physical activity and differences in the physical environment of disadvantaged areas compared with more affluent areas). We then discuss the social environment.

The physical environment

There has been a great deal of research into how physical environment influences health. For more in depth information we refer the readers to existing reviews (e.g.38). We begin with a focus on the food retail environment because of links between diet and obesity.

Neighbourhood food retail outlets

In this section we focus on whether disadvantaged areas are also disadvantaged in terms of food resources. The food environment was thought to be important for physical health because of the link between poor diet and obesity. Fast food consumption has increased and although even fast food has become more healthy, levels of fat have fallen faster in homecooked food (21). Proximity to fast food outlets has been hypothesised to increase BMI whereas proximity to supermarkets, where healthy options are more likely to be available, may be associated with lower BMI.

Often deprived areas, particularly if they are urban, actually have better access to resources as less desirable neighbourhoods are often located near to shopping areas and other city amenities (62-63). However disadvantaged people may also have greater access to less desirable facilities, such as takeaways. Areas which lack access to healthy food have been termed 'food deserts'. There is evidence that food deserts, which are associated with poor diet, do exist in disadvantaged areas in the US and possibly parts of Australia. However they do not appear to exist elsewhere in the developed world (14, 38, 64-69). There is little evidence to suggest that changes in the food environment will lead to improved diet (64); if obesity rates are to be reduced through diet, issues other than access to food outlets will need to be addressed. There is more evidence to suggest that access to locations conducive to physical activity can lead to increased activity (64). However we should note the caveat that reductions in BMI are more prominent from reducing food intake than increasing physical activity (see other EDPHIS reports). In this paper we are simply suggesting that the environment may have a larger role to play increasing physical activity than reducing food intake.

Neighbourhoods that encourage physical activity (commuting and playing)

There are two main ways that children can undertake physical activity within a neighbourhood. Firstly, it can occur through active travel; walking or cycling from one place to another. Secondly, it can occur through play. Both of these are more likely to occur when traffic calming measures are in force.

Neighbourhoods can and do influence 'walkability' and 'active transport' through their design, traffic calming and their security. People are more likely to walk, or cycle in some neighbourhoods than others. Features which are associated with less active transport, through objective and subjective measurement, include no pavements, exclusive residential use and sprawl (as compared with street interconnectivity (many crossroads) and composite convenience of facilities (particularly destinations that encourage physical activity)) (15, 21-22, 33, 51, 70-71). Furthermore, areas with high walkability have been found to have lower rates of hypertension, obesity and of exposure to pollutants (15, 71-72). However, the relationships are complex and confounded by the social and economic characteristics of more disadvantaged populations. In particular, car access is lower in deprived populations, which can encourage walking, but having a car also increases access to sites which encourage physical activity (15).

Active transport leads to less car use and in turn reduces accidents (12). However, traffic calming may be needed in order to raise active travel levels. The Marmot Report suggests that in residential areas speed limits should be as low as 10mph (10). Features such as traffic lights increase the chances of teenage girls walking (73). As well as traffic calming, other modes of transport should be promoted; cycle lanes should be separate from car traffic and there should be an integrated public transport policy (10, 21).

Rather than just an environment through which to commute, streets were traditionally places for children to play. Today, cul-de-sacs are still associated with increased activity for many children as cars travel slowly and are few in number (33, 73). Traffic is one of the main factors that stops children playing in the street (1). Perceptions of heavy traffic are associated with less walking (51) and parental perception of heavy traffic is associated with obesity in children (74).

Some weaknesses and inconsistencies remain in the literature on active travel. The extent to which people who want to walk select areas of residence with high walkability or vice versa is not clear. Active people might choose to walk rather than the active commuting being the reason for higher levels of physical exercise; some active commutes may be so short that they do not significantly increase physical activity (75). The aesthetic qualities of the environment are associated with physical activity in general, but not active commuting (51). Studies on children do not always find robust relationships for both genders and different age groups (22, 73).

Some of the inconsistent results are a function of genuine within-population differences in behaviour and attitude, rather than problems with study design or quality of evidence. Girls, for example, are more likely to use the street for chatting whereas boys are more likely to engage in physical activities such as skate boarding (4). Additionally, the neighbourhood has more impact for some people than others. Those who spend more time in an environment are more likely to feel its affects. Those who spend time in their neighbourhood include children, low income women, those with poor mental health, and those without access to private transport (11, 13). There are more cars than children in the UK which makes it hard to champion children's needs. Cars and commerce are often prioritised above children in neighbourhood development (1). Urban regeneration has favoured high density development, often for financial reasons (such as high land values) but also to try and increase walkability and access to public transport. This has unintended consequences; high

density neighbourhoods for low income families have experimented with shared usage space for children and cars, but this has often meant cutting down on play space and green space for children (1). Physical activity in the neighbourhood is likely to be affected by its design and condition and socioeconomic status.

Neighbourhood physical design, condition and disadvantage

Outside the USA, disadvantaged urban neighbourhoods tend not to lack resources (such as education, healthy food sales points, recreation facilities or access to health care) (62-63). However, as with green spaces, the quality of those resources may not be equivalent and they are not necessarily resources that local children will use.

Children living in disadvantaged families are often also living in neighbourhoods which are not well designed. Thus they suffer from a 'double disadvantage' and the associated cumulative or synergistic risk factors increase the chance of harm (11). The norm of car access has meant that children in households without access to a car cannot access play and physical activity facilities which have been designed and sited to be available to those who do have private transport (13). Where facilities that charge entry are successful in a local area, free facilities may be downgraded. Yet the free alternatives of street play, loitering and skateboarding are often prohibited (1). Traffic accidents are three times more likely to happen to children from the most deprived compared with the most affluent areas, yet these children are the least likely to be travelling in cars (1).

The quality and frequency of maintenance is often lower in disadvantaged areas (1). More greenery and less litter is associated with lower levels of obesity (76) and feeling satisfied with the area (48) but disadvantaged areas tend to have more litter, fly tipping and may actually require more maintenance because they tend to be more densely settled (1). Services, such as policing and street lighting, may also be relatively poor, compared to more affluent areas (13). A large number of children experience poverty in Britain. They are more likely to be resident in these areas and they have been found to be some of 'fiercest critics' of the lack of upkeep in a neighbourhood (1). Some evidence suggests, however, that the attractiveness of a street environment is not always directly linked to behaviour. In a study of deprived Glasgow neighbourhoods (77) attractiveness of the buildings and the neighbourhood was not related to frequent neighbourhood walking.

Bronfenbrenner's model has been used to distinguish between macro environmental neighbourhood features such as road layout, density and transport policy, and micro environmental features which relate to the actual experience of being in that environment such as facilities to encourage walking or cycling, traffic calming, aesthetics, and social characteristics such as levels of crime and incivilities. In a study controlling for the influence of macro environmental features, the micro environmental features were shown to be less conducive to active transport in more disadvantaged areas (36).

In summary, the physical environment of disadvantaged neighbourhoods, where many of Britain's poorest children reside, is often low quality. It is not necessarily the case that resources are absent, the problem is that families more often lack access to cars so facilities available to the affluent majority are out of reach. Furthermore the upkeep of such areas is often poor.

The neighbourhood social environment

Socio-cultural features include a neighbourhood's history in terms of politics, economics, religion and ethnicity; neighbourhood norms and values; integration of residents and support networks and security through crime levels, incivilities and personal safety (13). We discuss the social environment in terms of social bonds, feelings of control and security. We then consider ways to improve it.

Unless the social environment is supportive, it is unlikely that residents will act on advice to become more physically active (3). The social environment (including socioeconomic status, social support, cohesion, control and collective efficacy, crime rate, voluntary associations, and residential stability) has been found to have small to moderate effects (10% of the variance) on child health outcomes such as low birth weight, injuries, behavioural problems and child maltreatment (78). Neighbourhood affluence has been consistently found to be protective of the health of its residents (79). Neighbourhood social disorder is related to poorer health; there is a stronger relationship between social disorder and health than between health and physical conditions, services/ amenities and social capital (79). In a study set exclusively in poor Glasgow neighbourhoods, walking frequently in the neighbourhood was related strongly to a strong sense of community, a strong sense of belonging and feeling the neighbourhood was safe and harmonious (77). Thus if the social environment is positive then barriers driven by economic inequalities can be overcome.

The social networks and social cohesion of a neighbourhood affects how likely it is that individual residents will engage in physical activity through other people to exercise with, and ability to share resources (for example lending a neighbour a tennis racket) so that a norm of physical activity is more likely to be established. Closer social relationships also increase the chance that residents will work together to lobby for resources (3). In addition to informal social relationships, more formal opportunities for people to interact are also associated with health, (membership of voluntary organisations in Hamilton Canada, for example, was related to BMI (80)) and volunteering can improve the mental wellbeing of some of the most excluded groups, allowing them to begin to reconnect with the rest of society and reach support (42). However membership of clubs and organisations is particularly low in deprived areas (59).

Support is also diminished in neighbourhoods with a transient population – such neighbourhoods have weak social ties and more drug dealing, graffiti and gangs (81) regardless of ethnic mix or socioeconomic status. Being able to call on neighbours provides a sense of security (10). Some deprived areas in Glasgow, particularly where there are a high proportion of children, have less support available because they have a low proportion of older people (59). Absence of elders can reduce informal social control. Without social integration in a neighbourhood, green spaces situated there are unlikely to be perceived as safe and so can be underused (82).

The social environment is affected by density of dwellings(11). Higher residential density diminishes social support and increases psychological distress. Overcrowding and noise makes getting to know neighbours less likely. Control and ownership of spaces around the dwelling are important for wellbeing and feeling safe whereas noise, crowding and exposure to pollutants leads to learned helplessness particularly in girls (11). Residents of multi storey flats are less likely to walk in their neighbourhoods than inhabitants of other dwelling types (77).

In disadvantaged neighbourhoods smaller dwelling size may mean children are more likely to play outside in the less spacious public areas. Different residents' preferences may mean that children's desires are excluded – for example ball games may be prohibited. As there is less social interaction,

the route of prohibition rather than understanding is more likely. The prevailing social climate of intolerance towards children (see green space section) has reduced their freedom, trust, confidence and agency in walking to school, the town centre and the local neighbourhood leading them to feel abandoned (1). The physical environment is easier for children to change than the social environment because it is simple, fixed and available (57), thus to claim ownership and increase feelings of control children can engage in undesirable behaviours such as graffiti and vandalism.

When we discussed green spaces and feeling of security, we noted that risks to children tended to be exaggerated in British culture. However, the result was that children were more likely to be denied access green space. The same is true of the neighbourhood more generally – where parents fear for their children’s safety, they are often not allowed to play. Safety fears stem both from traffic and from concerns about other people, The condition of the physical environment is often taken as an indication of its safety – so children and the elderly withdraw from public spaces and streets which are poorly maintained or which appear ‘unsafe’ (10). Furthermore, in a study of Glasgow’s deprived neighbourhoods, areas with a lot of litter, graffiti and run down shopping areas were most likely to be those where more anti social behaviour was reported (59). Thus the physical environment shapes the social environment, and vice versa.

An area’s reputation is an important component of the social environment (13). ‘Quiet and peaceful’ was the most commonly mentioned feature of what makes somewhere a good place to live (48). A poor reputation may lead to an area being overlooked, or at least not prioritised by service or amenity planners. It may also reduce the self esteem and morale of inhabitants so they are less likely to lobby for improvements. There may, in turn, be less expenditure on the neighbourhood, contributing to a spiral of social and physical environmental decline. Such decline is associated with increased chances of substance abuse in the population, which increases crime and stress for everyone, both of which reduce the chances of physical activity being engaged in (3). Sometimes governments may have an overt policy of spending less in such areas. For example greater cuts have been made in English grants to local authorities with a higher proportion of deprived areas (83).

Living in an affluent area however, is no guarantee of a positive neighbourhood experience for the children who live there. Rural children, who may inhabit what adults would view as an affluent idyll, can have less opportunity to interact with others of the same age due to lack of services as there are fewer families who can afford to live there, lack of peers who live close by and lack of public transport to independently visit friends elsewhere; thus they often report feelings of isolation and boredom (4).

How can the social environment be improved?

There are two options to improve the social environment of disadvantaged areas; promote the formation of community bonds or make structural changes to the built environment. Educational and motivational interventions are often short term but changes to the built environment may lead to longer term improvements (84).

Direct health-focused interventions have been found to reduce health risks to children of disadvantaged families (40, 78). Success is most likely to occur through campaigns that are well resourced, that have dedicated staff, which increase empowerment, which have community buy in and which consider multiple environments (home, school and the community) (10, 40, 85). However such interventions are often more successful in enhancing cohesions and creating neighbourhood bonds than they are in producing sustained changes in behaviour (12, 40). For long

term changes generally long term and stable funding is needed (10, 21). The effects on social cohesion and community bonds might have been unintended in pioneering interventions, but they are often now recognised as explicit aims of such interventions. ‘Deliberative’ interventions, in which local communities come to together to discuss pertinent local public health issues, have been shown to empower communities to achieve other improvements (86). Deprived areas tend to have low rates of collective efficacy (59) so community building activities are particularly important for these areas.

Some argue that governments’ role should be precisely, and perhaps only, to encourage the formation of relationships between citizens and to enable people to utilise public institutions and resources to improve wellbeing. An effective public realm pools resources so that wellbeing improvement is greater than could be managed by individuals acting alone.(1). Meeting spaces, such as churches, schools and village halls or other focal points are needed in every local community as locations where development activities can occur (10-11); in Glasgow, for example, antisocial behaviour has declined in areas with specialised ‘Youth Diversion’ projects (59). Thus the provision of physical facilities can also affect the social environment. Unfortunately, with current fiscal financial restraint, these are in danger of being lost (87).

How does this relate to children specifically? The neighbourhood environment for children can be improved by better planning and consulting more widely. Public health should be involved to ensure that new environments do not compromise health (10, 38). Children who are allowed the freedom to play out in their neighbourhood are often members of the community with the best knowledge of local areas so their understanding is likely to be a useful resource. Furthermore engagement in decisions over local services promotes respect, responsibility and inclusion which are advocated by ‘Getting it Right for Every child’(17) and meets the ‘Every Child Matters’ objective of making a contribution (44). Feeling empowered to be able to improve the local areas is linked to satisfaction with the area among Scottish adults (48). Thus despite that engaging with children is not necessarily a vote winner, as they do not have a vote, or a resource generator, it is important that they are involved. Currently children are not seen as central to local authority policy (12). A survey of local authorities in England suggests that training in enabling children’s participation is needed (1). Other European countries more effectively engage with young people than in Britain (4). To improve security so that children are allowed to play safely and have more freedom, more regular and formal policing is needed together with youth activities and centres. This is particularly true in areas with a quick turnover of population or where there are ethnic tensions (10).

In summary, the social environment is partly developed through cues from the physical environment. Physical environments in disadvantaged areas need continual investment to keep streets attractive and looking cared for. Good behaviour from young people, and more use of the local neighbourhood by all residents, encouraging social contact, may be the result (10). It has been argued that it is harder for governments to affect the social environment than the physical environment (88) and in Glasgow housing renewal professionals are concerned that funding for social regeneration has lagged behind that for physical regeneration and has been insufficient (59). Here we suggest that the social environment can be influenced by: providing community development activities in which residents can meet; providing locations for such activities to take place and for residents to meet informally; identifying key adults with influence and understanding of local issues; maintenance routines where disadvantaged neighbourhoods are given particular priority and empowering local people, including children, to have a genuine influence over local authority decisions that will effect their neighbourhood.

Healthy neighbourhoods for children

Research on neighbourhood and wellbeing takes a variety of perspectives; geographical access (e.g. Pearce (67)), health promotion of physical activity and healthy diet (e.g. Kahn (40)), psychological theories of control (e.g. Evans (11)) and health inequalities comparing poor and rich neighbourhoods (e.g. Marmot (41))). The literature as a whole does not yield a clear picture about what makes a healthy neighbourhood for children. Rather, it has provided a series of paradoxes: access to resources is not strongly related to health and wellbeing but walkability is, car availability provides access to more health promoting resources yet reduces active transport, high density living is conducive to active transport and sustainability but weakens social bonds and reduces neighbourhood play spaces.

It has also emerged that healthy neighbourhoods for children have a healthy social environment in terms of social cohesion, feelings of empowerment/control over neighbourhood direction and changes and feelings of security. Again however, there are issues about how and where to begin: control and cohesion are needed to feel secure, but a level of security is needed before social relationships and feelings of empowerment arise. A healthy social environment is likely to bring a positive physical environment but a poorly designed and maintained physical environment is likely to compromise the social environment.

A theoretical perspective

Many studies take a pragmatic rather than theoretical standpoint to researching healthy neighbourhood environments. Yet, there is currently little specific advice available to policy makers about effective actions which would reduce inequalities (42) within the general population, let alone for children. Use of theory can be helpful in developing guidelines. Here we look at how the unavailability of data has hampered theory development and then some theories that have been developed, DEMOS theory of quality of life, Bandura's socio cognitive model, Bronfenbrenner's ecological models and systems models such as mDPSEEA and their advantages and issues in their attempts to address the issue of place and health inequalities. We then make some suggestions for the enhancement of current theoretical work such as the inclusion of factors relating to health inequalities, subjective as well as objective viewpoints and taking into consideration the range of stakeholders in this field.

Lack of data has been a key problem hampering research assessing the role of access to neighbourhood resources, both social and physical (88). Data are generally not available at sufficiently fine spatial scales to conduct accurate analysis. Thus, even when theories have been developed, it is often not possible to test them adequately. DEMOS for example have developed a theory of quality of life with implicit spatial elements (see fig 2) such as public space, social networks and belonging. The theory includes two dimensions: tangibility, and individual *vs* collective. The intangible elements (wellbeing and trust) are hard to measure and relevant data are only available from national surveys which tend not to be available at a local level or can only be collected for a small sample of local areas due to resource constraints. Thus theory has only captured a few of the concepts involved in the field of environment and health.

The main theory used has been Bandura's social cognitive model (8) in which the individual can influence the physical and social environment and the social and physical environment can influence behaviour (89) This has been helpful as a starting point but may not lead to much further advancement as it reveals little of the complexity of the relationships.

Bronfenbrenner's ecological model, which was originally for exploring child development through their home and school and social ties, has been expanded to encompass neighbourhoods. However as it was not originally designed for neighbourhood research, neighbourhood has been conceptualised in different ways.

There are many interacting dynamic determinants of health and wellbeing which are environmental, social and biological. The connections between them are complex, and include feedback loops and non linear processes (11, 38, 90). Diez Roux advocates that a systems approach should be added to the perspectives from which environment and health is studied. This would provide for emergent properties which are not reducible to individual components, top down and bottom up synthesis and would allow for simulation of the effects of treatments under new conditions rather than only similar to observed conditions.

The mDPSEEA model effectively takes a systems approach. However the mDPSEEA model does not explicitly include health inequalities despite attempting to be a comprehensive description of the systems through which environments influence health and wellbeing.

We have outlined some of the issues facing those who wish to carry out theoretical development in this field. We now make some suggestions that could enhance theory and policy development.

Adding concepts that show how socioeconomic status of places produced a differential health effects would broaden and enhance the mDPSEEA model. We would therefore propose two further drivers should be added to the mDPSEEA model: firstly neoliberalism which suggests that resources should not be pooled and those who are disadvantaged are disadvantaged because they are 'losers' and help will create dependence rather than self reliance (91) and secondly social justice that advocates that all policies should be considered in terms of fairness - everybody should have equal opportunities and at least a minimum standard of living (41). Pressures from neoliberalism include shrinking the state and lowering taxes and pressures from social justice include measures to reduce inequalities. The balance of these within a jurisdiction is likely to affect population opinion and government policy towards children, neighbourhood and wellbeing.

Another issue which should feed into a systems approach is that there is often a discrepancy between what is objectively measured and what is perceived, examples include aesthetics and threats to security. The discrepancy may be able to be understood by exploring the meanings of environmental features (47). Both need to be measured and those measurements challenged in order to enhance child wellbeing.

In general some principles on which much previous research in this area has been conducted need to be questioned. For example most research on young people and physical activity has been of structured rather than unstructured activity (6). Arguably the very presence of a researcher is more likely to change the nature of unstructured rather than structured activities. Thus researchers need to consider whether instead of taking an ethnographic approach (other's view) they should be taking an anthropological approach (everyone's view) (47). This may be of particular relevance to this field which is of active policy interest; for instance before the 'food desert' hypothesis was properly tested, policies were put into place to prevent them but when studied no food deserts were not generally uncovered. To formulate policy children's, communities', researchers' and policy makers' agendas need to be considered.

We thus advocate that in future a systems approach is used which will take into account biological social and environmental determinants, perceived versus objective, private versus public, collective

versus individual and tangible versus intangible. We also suggest that an anthropological rather than an ethnographic perspective is taken by researchers and policy makers – a ‘we’re in it together’ approach.

Related areas

A systems approach advocates seeing the research question in terms of related concepts. The mDPSEEA model suggests that other important spaces are education, such as the availability of good schools locally, dwelling and healthcare settings and that population, economic and culture and globalisation drivers are taken into account.

Other than the neighbourhood, there are other concepts that have the potential to have influence on the environmental and health relationship for children such as the dwelling they reside in, wider geographical features and sustainability. In this paper we have largely considered collective effects but changes to the composition of the neighbourhood population have also been studied.

The dwelling and the neighbourhood are closely linked as both, partly through their governance have an important impact on social status, on how individuals feel and how they will function as parents. However the dwelling itself should not be ignored. Children’s closest relationships with other people are often with those who reside in the same dwelling. Work on attachment theory suggests that unless relationships with parents (or parent substitutes) are positive, children’s wellbeing and even health is compromised (92). A Scottish study suggests that once parental attributes are taken into account, the neighbourhood does not have an influence on preschool child wellbeing (93). The condition of the dwelling itself is also of relevance to mental health (11). Poor housing conditions are associated with mental and physical health problems and a higher risk of accidents. Insufficiently warm accommodation is also a health issue (10). Renting can lead to further stresses as the landlord rather than the occupiers controls when and if repairs take place and insecurity of tenure can lead to frequent moves (11). A growing proportion of the British housing stock is in disrepair and private renting is increasing (86). In this report we have focussed on public green spaces; private gardens are also green spaces. Access to them depends, however, on the permission of the householder. The relevance of private gardens as compared to publically owned spaces such as parks and neighbourhoods for children but needs further academic research (94).

At larger scales there may be physical features which are shared by many neighbourhoods, whole towns and cities, or even regions, including pollutants, air and water quality, latitude and climate (13). Policies often operate at large spatial scales, but can have an effect at neighbourhood level. Sustainability policies are an example, for instance through the prevention of flooding. Flooding of homes and neighbourhoods can cause major upheaval in children’s lives (95). During the early 2000s sustainability became an important government priority. The rate at which resources are consumed by richer nations is unsustainable. This may lead to an insecure environment for all (44). From this perspective, healthy environments for children also need to be sustainable. Ideally, policies to do so would both prevent environmental degradation and at the same time improve health and social justice for children (96). The provision of community gardens and allotments are a sustainable way to provide play, physical activity and food production, for example (6, 10, 12, 44). Yet, the conflict between sustainable development and aesthetics remains strong, with local opposition to wind turbines being a fine illustration (44).

Population and economic drivers create disadvantaged places. Disadvantaged neighbourhoods generally have a concentration of people with multiple problems such as ill health and unemployment and have high mortality rates(59). Conversely a systems approach suggests that

reducing one driver of disadvantage may lead to reductions in other sources of disadvantage. Bringing jobs to an area can reduce unemployment and have consequent improvements in wellbeing for workers and their families. Working adults can be role models for children in their area (97). Mixing populations through mixed tenure schemes have been advocated to reduce ghettoisation for disadvantaged people (97) although evidence of the benefits has been mixed at best (98).

Thus the healthiest neighbourhoods will only, in the long term, produce healthy children if they live in happy and healthy housing conditions, healthy cities, towns or countryside and that policies followed are environmentally sustainable.

Conclusion: what is needed to deliver healthy places for children

In this review the focus on place has been achieved through looking at neighbourhoods and green spaces. For neighbourhood policies there are interest groups with many different agendas. Business looks at neighbourhoods in terms of the profit that can be made, politicians look for votes, environmentalists look for sustainable ways to live and health inequalities campaigners look at the socioeconomic status and health of residents. Among all these voices, those of children have tended to be lost. Recently, at least partly as a result of the revelation of the poor state of children's wellbeing in the UK through the UNICEF report, attention has turned towards children. However little literature directly focusing on children is available; much of this review has assumed that conclusions regarding adults and teenagers also apply to children.

Physical design is important for encouraging physical activity and play in green spaces. Features which specifically encourage physical activity such as trails are helpful. In terms of play spaces affordance or function is more important than aesthetics. However such spaces will only be used where the social environment is conducive. Healthy green spaces for children need to include facilities that encourage physical exercise such as trails, playgrounds for younger children and open spaces for older children. For children although aesthetics are desirable, design to enable play is a higher priority. To increase feelings of safety for children and their caregivers, green spaces need to be designed to provide maximum view. For younger children there needs to be places where they can interact with adults but also places where adults can watch discreetly so that children can develop their own agenda and for teenagers and young people there should be spaces to congregate without being seen as a threat.

Good places for children's wellbeing are where they feel safe (and their caregivers believe they will be safe) and where they have some influence over activities they engage in. The best neighbourhoods for children are those in which social bonds between residents are positive. If green spaces are located in such neighbourhoods they are more likely to be used and thus their potential for the enhancement of health and wellbeing realised.

For many British children, their neighbourhood is largely irrelevant. It is somewhere they are driven through on their way to other destinations. Due to fears about 'stranger danger', local teenagers and traffic accidents, the neighbourhood is often no longer thought of as a play space. Those children who do play on the streets are often the most disadvantaged. Paradoxically, the neighbourhoods they play in are likely to be the least safe in terms of crime and traffic. Due to high density of housing in such areas they are also perhaps most likely to cause offence to other residents.

What can be done to make places better for children's wellbeing? In this paper we have seen that the social environment appears to be more important than the physical environment, but also that the physical environment can influence the social environment. It is generally more difficult to change the social than the physical environment, but we have identified interventions via which the social environment can be improved.

Neighbourhoods which are good for children's health and wellbeing can be created through: designing focal points and meeting places such as village halls into new areas, restricting density, providing spaces for teenagers and young people to 'own' so that they are not perceived as intimidating in public space; in existing neighbourhoods the provision of community activities are a focus through which public bonds can be formed and to improve feelings of security good and timely maintenance and personnel to keep an eye on things can be helpful. These things are particularly necessary in disadvantaged areas.

Research in this area can be enhanced by taking a systems approach, as advocated by Diez Roux. To deepen understanding of what works to improve children's wellbeing it is necessary to look at neighbourhoods in terms of larger and smaller scales and consider perceived meanings as well as objective characteristics. Aesthetics and accessibility have been studied extensively. Both of these appear to be less important in the association between place and health than affordances (function) and the social environment: people will not allow their children to use the beautiful park round the corner if they feel threatened there and children will not want to go somewhere where they perceive there is nothing for them to do.

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Figure 1: Mental health and wellbeing integrated modified Driver, Pressure, State, Environmental exposure, Effects and Actions (mDPSEEA) model

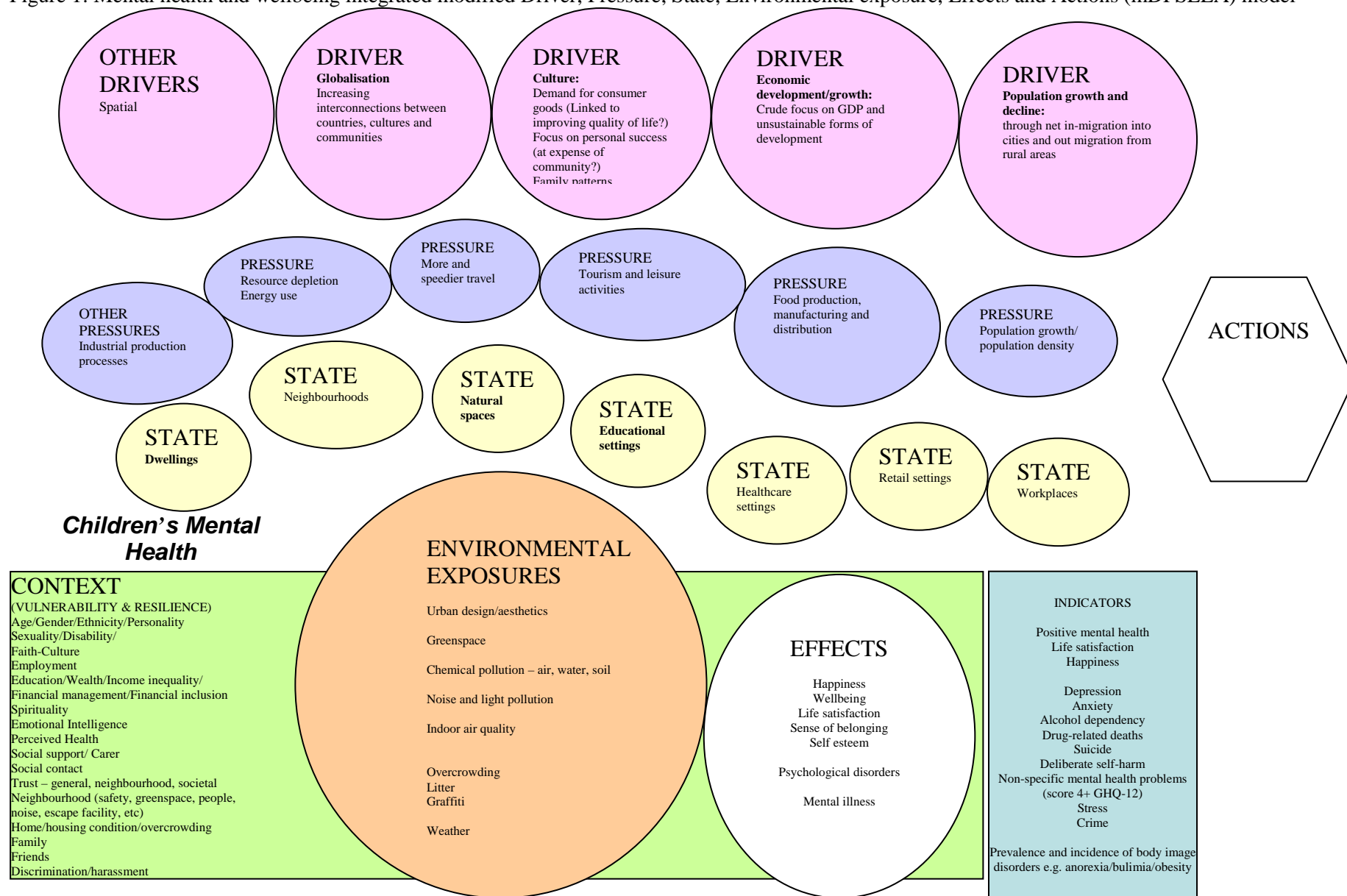
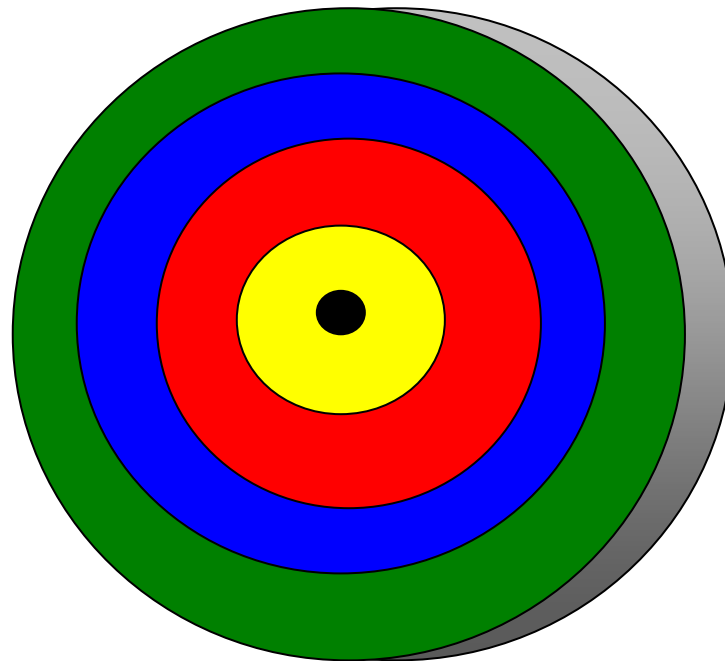


Figure 2 Bronfenbrenner's ecological model of child development



Key

- Individual child – age, gender, ethnicity
- Microsystem – home, school, parents
- Mesosystem- relations between environments e.g. home and neighbourhood
- Exosystem- environments important to the child but they do not actually enter them e.g. parents' work
- Macrosystem- social institutions- affect the whole of society e.g. youth services resources
- Chronosystem- processes occur over time

Figure 3 DEMOS theory of quality of life (1)

