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WORLD HEALTH ORGANIZATION
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Tackling Obesity by Creating Healthy Residential Environments

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EUROPE

Tackling Obesity by Creating Healthy Residential Environments

Edited by: S. Schoeppe and M. Braubach

ABSTRACT

Increasing obesity rates are a serious public health issue in the WHO European Region. Physical inactivity plays a key role in the development of obesity. The design and quality of the residential environment in turn affects physical activity. With support from the German Ministry of Health, the WHO European Centre for Environment and Health conducted the project "Tackling obesity by creating healthy residential environments" in 2006 and 2007. This comprised (*a*) a review of the literature on relationships between the residential environment, physical activity and obesity; (*b*) a European review of interventions to create residential environments that support physical activity, including the compilation of European case studies; (*c*) an expert meeting to discuss the literature evidence as well as selected European case studies; and (*d*) a secondary analysis of the WHO LARES (Large Analysis and Review of European housing and health Status) survey regarding the association between the built environment and socioeconomic factors with physical activity, overweight and obesity. The overall project findings confirm that various characteristics of the residential environment can promote physical activity, such as aesthetically pleasing neighbourhoods, access to physical activity facilities, density, land use mix, street connectivity, opportunities for public transport (including active commuting) and perceived safety in the neighbourhood. There are a number of local community interventions addressing these factors, but only a few are adequately evaluated. Different resident groups, as well as key stakeholders from governmental, nongovernmental and private industry organizations in different sectors, need to be involved in the planning, implementation and evaluation of activity-promoting interventions. National and local-level political commitment from key decision-makers and long-term funding are crucial for successful and sustainable implementation of interventions.

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Executive Summary

In the European Region of WHO, population rates of obesity have risen three-fold since the 1980s. Currently, about 400 million adults in the Region are estimated to be overweight (a body mass index (BMI) of 25 and over) and some 130 million of these are estimated to be obese (a BMI of 30 and over)

The project "Tackling obesity by creating healthy residential environments" aimed to identify and discuss the determinants that may encourage or impede an active lifestyle in the residential environment, and thereby have an impact on the development of overweight and obesity. Specifically the project aimed to

- review the literature on residential environment, physical activity and obesity;
- conduct secondary analyses of the WHO LARES data on housing and physical exercise;
- identify and compile case studies of good practice on a pan-European scale; and
- convene an expert meeting to discuss current evidence as well as the European case studies.

The overall findings from the project showed that residential environment characteristics can positively influence physical activity and reduce the risk of overweight and obesity, by providing adequate and qualitative opportunities for recreation and exercise. For different target groups (children and adolescents, older people, socially disadvantaged groups), specific interventions in the residential environment are required.

Based on the evidence and the discussion of case studies, the project concluded that several intervention approaches are suitable for creating residential environments that support physical activity, such as:

- creating footpaths and cycle trails;
- providing opportunities for active commuting, including public transport;
- providing access to physical activity facilities throughout the year (e.g. parks, open spaces, playgrounds, indoor and outdoor sports facilities);
- increasing the quality, aesthetic design and attractiveness of residential areas;
- connecting streets to facilitate short distances between destinations;
- providing mixed land use;
- reducing crime or fear of crime (e.g. by providing street lighting, pleasant neighbourhoods free of graffiti, litter and incivilities; and by introducing crime prevention measures); and
- improving road safety (e.g. through traffic calming measures, speed limits, well-maintained pavements and street lighting).

There are three types of approach to implementing interventions:

- building new opportunities/facilities for physical activity in the residential environment;
- modifying or improving existing opportunities/facilities for physical activity in the residential environment; and
- making existing opportunities/facilities more accessible, particularly for key target groups.

Interventions should be targeted at the whole population as well as to specific population groups (e.g. children, older people, the socially disadvantaged), and apply participatory approaches. For the long-term success of such interventions, national as well as local level political commitment from decision makers and politicians is crucial.

The project also concluded that – with a number of local interventions already being undertaken by local and national authorities – more interventions to create environments that support physical activity need to be evaluated in order to assess the impact on physical activity behaviour and health. Evaluation activities should therefore be planned at the beginning of the project.

Glossary

Accessibility
Accessibility is the ease of access to destinations or facilities. High accessibility of local infrastructures and places means that they are easy and convenient to access (e.g. in terms of cost, time and distance).

Active living
Active living is a way of life that integrates physical activity in daily routines. The goal for the general population is to accumulate at least 30 minutes of physical activity each day. This may occur in a variety of ways, such as walking and cycling for transportation, exercise, playing in a park, working in the garden, taking the stairs, and using recreational facilities.

Active transport
Active transport comprises non-motorized but human-powered modes of transportation, such as walking or cycling to work, to school or to carry out errands. Sufficient opportunities for public transport increase people's likelihood of walking and cycling in combination with using public transport.

Aesthetics
Aesthetics addresses the quality and design of an environment. Aesthetically pleasing, well-maintained and interesting environments that meet the needs of different population groups within a residential area increase people's readiness to walk and cycle in the neighbourhood and use recreational facilities.

Body Mass Index (BMI)
The BMI is the most commonly used measure for overweight and obesity. It is calculated as the quotient of weight in kilograms divided by height squared in metres.

Built environment
Defined broadly the built environment includes land use patterns, the transportation system, and design features that together provide opportunities for travel and physical activity. Land use patterns refer to the spatial distribution of human activities. The transportation system refers to the physical infrastructure and services that provide connectivity among activities. Design features refer to the aesthetic, physical and functional qualities of the built environment, such as the design of buildings and streetscapes, and relates to both land use patterns and the transportation system.

Connectivity
Connectivity relates to the directness of travel to destinations: a street network that provides direct and safe travel routes between destinations for pedestrians and cyclists (non-motorized transport). Connectivity is determined by the kind of intersections and density in a given area.

Density
Density relates to population and services per unit area. As density increases, time and distances for travel between destinations tend to decline and people are more likely to walk or cycle and to use public transport (active transport).

Energy imbalance
Energy imbalance exists when energy intake (calories consumed) exceeds or is less than the total daily energy expenditure. Weight gain occurs when energy intake exceeds total daily energy expenditure for a longer period of time.

Exercise
Exercise is a particular type of physical activity that is not incidental but planned and structured, with the aim of improving or maintaining various aspects of physical fitness.

Health-enhancing physical activity
Health-enhancing physical activity emphasizes the relationship between physical activity and health by focusing on any form of physical activity that benefits health and functional capacity without creating undue harm or risk.

Housing
WHO uses a broad definition of housing, including four interrelated dimensions: (*a*) the physical structure of the house as a shelter; (*b*) the mental construct of the home as a safe harbour and refuge, as well as the place where family life occurs; (*c*) the quality and infrastructure of the neighbourhood and the immediate environment; and (*d*) the community and its residents, which form a social climate.

Land use mix
A mixed land use includes residential, commercial and industrial environments within a certain geographical area and is associated with shorter travel distances between places in daily life.

Neighbourhood
There is currently no clear definition of what a neighbourhood constitutes. various definitions have been proposed in previous studies, such as: within the resident's own street; within a 400-metre radius of the home; within 1.6 km of the home, within a 10- to 15-minute walk from the home; the area within which people get to work, school or kindergarten; and within the post code area.

Obesity and overweight
According to international WHO classification, adults are overweight when they have a BMI of between 25 and 29.9, and as being obese when they have a BMI of 30 or more.

Open spaces
Open spaces describe outdoor public places for recreation, such as parks (with and without play equipment), playgrounds, recreational grounds, sports fields and esplanades.

Perceived safety
Perceived safety can relate to road safety as well as to safety from or no fear of crime. Perceived safety means that people feel subjectively safe in their residential area.

Physical activity
Physical activity is any bodily movement produced by skeletal muscle that results in a substantial increase over the resting energy expenditure.

Physical environment
The physical environment includes the built and the natural environment. The residential environment or neighbourhood environment is part of the physical environment, and particularly of the built environment on a smaller scale.

Residential environment
The residential environment is that part of the built environment that refers to the immediate neighbourhood and affects the daily life of the residents.

Social ecological model
The social ecological model is one of the models used to describe factors influencing physical activity behaviour and health outcomes. It is based on the social cognitive theory, which explains behaviour in terms of reciprocal relationships among the characteristics of a person, the person's behaviour, and the environment in which the behaviour is performed. Ecological models emphasize the role of the physical as well as the social environment.

Walkability
Walkability is the degree to which a single route, or a system of routes, between points is relatively short, barrier-free, interesting, safe, well-lighted, comfortable and inviting to pedestrians.

Background

Increasing population rates of overweight and obesity have become a serious public health issue in many countries in the WHO European Region. The prevalence of obesity has risen three-fold since the 1980s and has now reached epidemic proportions. Currently, about 400 million adults in the Region are estimated to be overweight (a body mass index (BMI) of 25 and over) and some 130 million of these are estimated to be obese (a BMI of 30 and over) *(1)*. There are great differences in the prevalence of overweight and obesity in different countries in Europe. Most recent nationally representative data (collected in the past five years) show that the prevalence of overweight ranges between 32% and 79% in men and between 28% and 78% in women. The prevalence of obesity ranges from 5% to 23% among men and between 7% and 36% among women *(2)*. With regard to children and adolescents, various studies have estimated that 10–30% of European children aged 7–11 years and 8–25% of adolescents aged 14–17 years carry excess body weight *(1, 3)*. The 2001–2002 Health Behaviour in School-aged Children survey provided comparable population data for 35 countries in Europe and North America: 3–35% of 13- and 15-year-olds are overweight and about one quarter of overweight adolescents are estimated to be obese. The rise in childhood obesity is of particular concern, since over 60% of children who are overweight before puberty will be overweight in early adulthood *(2, 4)*.

In Germany, population levels of overweight and obesity are also alarming. Representative adult population data from the National Health Survey (collected between 2003 and 2006) showed that about 51% of men and 36% of women are overweight. The prevalence of obesity is about 17% among men and 19% among women *(5)*. Recent national data from the German health survey for children and adolescents (collected between 2003 and 2006) revealed that about 1.9 million children and adolescents (aged 3–17 years) are overweight and about 800 000 of these are obese. The prevalence of overweight among children and adolescents is 15% and the prevalence of obesity 6.3% *(6)*. The survey findings suggest that overweight and obesity already occurs at primary school age and that it particularly affects children and adolescents from families of lower socioeconomic status and those with a migrant background.

The most significant health consequences of overweight and obesity are hypertension, dislipidaemia and impaired insulin resistance (all major risk factors for health), major noncommunicable diseases such as coronary heart disease, ischaemic stroke, type 2 diabetes, breast and colon cancer and osteoporosis, and psychosocial problems *(2)*. Unhealthy diet and a sedentary lifestyle are the main contributors to overweight and obesity. Excess body weight results when energy intake exceeds energy expenditure. Therefore, physical activity plays an important role in the reduction of overweight and obesity. Moreover, it positively affects the other major health risk factors (high blood pressure and high levels of blood lipids and blood glucose) and noncommunicable diseases *(7-9)*.

Sedentary lifestyles have become very prevalent in many European countries. The 2002 Eurobarometer Survey showed that at least two thirds of the adult population in the European Union (EU) countries are insufficiently physically active for maintaining their health *(10)*. With regard to children and adolescents, the 2001–2002 Health Behaviour in School-aged Children survey revealed that two thirds of young people (aged 11, 13 and 15 years) did not reach recommended levels of physical activity *(11)*. There is international consensus on the amount of physical activity beneficial for health. For adults, the current recommendation is to accumulate at least 30 minutes of moderate-intensity physical activity on five or more days per week. Children and adolescents should engage in at least 60 minutes of moderate-intensity physical activity on most days of the week. To combat weight gain, longer periods of physical activity, such as 60–90 minutes of walking or higher-intensity exercise per day, are proposed *(2)*.

Physical activity behaviour is determined by individual factors (such as attitudes to physical activity, or belief in one's ability to be active), the microenvironment (the conduciveness to physical activity of the places where people live, learn and work) and the macroenvironment (general socioeconomic, cultural and environmental conditions) *(12, 13)*. Interventions that aim to create residential environments that support physical activity are therefore suitable population-based approaches for tackling the rising population levels of physical inactivity and obesity in the WHO European Region *(14)*.

Policy context

The WHO European Centre for Environment and Health, Bonn Office (Housing and Health Unit) carried out a project entitled "Tackling obesity by creating healthy residential environments" in the context of the implementation of various policy-related action plans, programmes and strategies in the WHO European Region. The project was supported by the German Ministry of Health.

Through this project, WHO supports its Member States in fulfilling their commitment to tackle the obesity pandemic, as stated in the Budapest Declaration *(15)*. This Declaration was adopted by Ministers of Health and of the Environment at the Fourth Ministerial Conference on Environment and Health held in Budapest, Hungary, on 23–25 June 2004. The Children's Environment and Health Action Plan for Europe (CEHAPE) which is attached to the Budapest Declaration, specifically addresses the need for developing actions aimed at providing healthy, activity-friendly living environments for children *(16)*. For example, the CEHAPE refers in many areas to preventing the health consequences of a lack of physical activity. Specifically, it calls for action "through the integration of children's needs into housing" and "actions (…) helping to create healthy and enabling human settlements". One Regional Priority Goal identified for implementing the CEHAPE is to "pursue a decrease in morbidity from lack of adequate physical activity, by promoting safe, secure and supportive human settlements for all children". Specific proposed actions related to physical activity are the provision of safe and healthy opportunities for children to engage in daily physical activity (for example, through the promotion of cycling and walking and public transport) and the provision of accessible facilities for play and sports. Another aim is to bring about a reduction in the prevalence of overweight and obesity among children and adolescents.

WHO also advocates and supports the implementation of actions as outlined in the European Charter on Counteracting Obesity, recently adopted by ministers and other delegates attending the WHO European Ministerial Conference on Counteracting Obesity, in Istanbul, Turkey on 15–17 November 2006 *(17)*. The Ministerial Conference was convened by the Regional Office with the aim of increasing awareness of the obesity epidemic in Europe among high-level politicians in health ministries and those in other sectors such as agriculture, transport, environment and education, and to foster intersectoral action and cooperation among WHO, its Member States, civil society and other international partners in the Region. The urban and housing environments are among the settings identified for preventive actions. Proposed actions in terms of promoting physical activity are, for example, increased opportunities for cycling and walking through better urban design, and creating opportunities in local environments that motivate people to be physically active in daily life and to engage in leisure-time activities.

The Regional Office document *Promoting physical activity for health – a framework for action in the WHO European Region* was also presented at the Ministerial Conference *(18)*. It outlines key messages and recommendations to guide Member States in designing and implementing policies and actions that promote physical activity as part of their national public health agendas.

Specific recommendations in the context of urban planning and housing environment are, for example, (*a*) to encourage mixed land use that involves the development of affordable housing linked to shops, parks and public transport; (*b*) to improve conditions in residential areas by ensuring that housing is maintained and that the environment around buildings is safe and suitable for pedestrians; and (*c*) to support citizen participation and integrated approaches in neighbourhood and urban planning processes.

All the documents mentioned above contribute towards implementing the WHO Global Strategy on Diet, Physical Activity and Health for 2005–2007, developed by WHO headquarters and endorsed at the Fifty-seventh World Health Assembly in May 2004 *(19)*. The Global Strategy aims to reduce the risk factors for noncommunicable diseases that stem from unhealthy eating and physical inactivity. It is to raise awareness of the importance of healthy diets and physical activity for preventing noncommunicable diseases, and to guide Member States in all WHO regions in developing, implementing and monitoring their national population-based policies, programmes and guidelines for the promotion of healthy diets and physical activity.

With regard to German policy, this project (which is supported by the German Federal Ministry of Health) is especially relevant in the context of the national campaign "Jeden Tag 3.000 Schritte extra" (3000 steps more each day), which aims at inspiring the population to increase levels of physical activity *(20)*. This is a key objective of the disease prevention department of the Federal Ministry, and was also defined as an EU priority on the occasion of the international conference on prevention, nutrition and physical activity *(21)*, which took place in February 2007 in the context of the German presidency of the EU.

The project also relates to the German National Action Programme on Environment and Health *(22)*. The Programme was initiated in 1999 jointly by the Federal Ministry of Health, the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and the Federal Ministry of Food, Agriculture and Consumer Protection. It provides a basis for nationwide action on promoting physical activity in the residential environment. As part of the Programme, support has been provided to a series of local community projects related to specific environment and health topics such as "Healthy living and residential environment".

Purpose of the project

The project is intended to highlight the importance for disease prevention of a physically active lifestyle and to reveal the links between the residential environment, physical activity and the increasingly overweight population. A residential environment that provides sufficient motivation and opportunities to exercise and be active in daily life makes a valuable contribution to a health-promoting lifestyle. The purpose of the project was to identify and discuss the determinants that may encourage or impede an active lifestyle in the residential environment, and thereby have an impact on the development of overweight and obesity.

Specifically, the project aimed to:

- review the literature on the relationships between the residential environment, physical activity and obesity;
- conduct secondary analyses of the WHO LARES (Large Analysis and Review of European housing and health Status) data on associations of environmental and socioeconomic factors with physical activity and BMI;
- identify and compile case studies on a pan-European scale of residential environments that are conducive to participation in physical activity and obesity reduction; and

- organize a meeting of experts to discuss current evidence in the literature on relationships between the residential environment, physical activity and obesity, as well as selected European case studies on improved residential environments and their impact on physical activity.

Since the project also addressed relevant sectors other than health, such as transport, housing, urban planning, environment, and sports and recreation, another of its objectives was information exchange and networking among stakeholders in these sectors. Moreover, specific population groups such as children and adolescents, older people and the socially disadvantaged were to be taken into consideration.

Overview of the literature

This section provides an overview of the literature regarding relationships between the design and quality of the residential environment, physical activity behaviour, and the risk or prevalence of overweight and obesity. The electronic database PubMed was searched for relevant peer-reviewed published articles on links between physical activity, obesity and health. Additional papers were identified by hand searching. The search was restricted to papers in the English language published between January 1990 and December 2006.

There is an increasing body of evidence showing how the built environment, and specifically the residential environment as part of the built environment, affects physical activity behaviour. Much less evidence is currently available on the influences of the built environment on weight status (overweight, obesity) *(23)*. Most of the available evidence on the links between the built environment, physical activity and obesity is based on observational rather than intervention studies. Moreover, the relationships observed cannot be interpreted as definitely causal (due, for example, to a lack of longitudinal studies) and they are not simple (due, for example, to other influences from the social environment and intra-individual factors) *(23)*.

Relationships between the residential environment and physical activity

Over the past decade, there has been a rapid increase in the number of studies showing that several factors in the residential environment (such as street lay-out, zoning, facilities for physical activity, recreation and shopping and other public services near the home, neighbourhood "walkability" and aesthetics, parks, playgrounds and other open spaces, and opportunities for active and public transport) are positively associated with physical activity behaviour and active living *(23-28)*. The specific impacts of these environmental characteristics are described below.

Safety

Real as well as perceived road safety (due, for example, to a lower traffic volume, speed limits, pedestrian crossings, pavements and sufficient street lighting) is associated with people's readiness to walk and cycle in an area *(24, 29-31)*. A Scottish intervention study showed that the introduction of a traffic calming scheme in a deprived urban neighbourhood in Glasgow resulted in an increase in pedestrian activity in the area *(32)*.

Safety from crime or no fear of crime (due, for example, to sufficient street lighting or low crime rates) in an area is also linked to walking and cycling for recreation and transport *(31, 33, 34)*. For example, a peer-reviewed intervention study in London found that improvements to street lighting led to greater public confidence, more use of streets after dark and generally more walking *(35)*.

Aesthetics and street design

The quality and design of the neighbourhood affects resident's opportunity for and willingness to being physically active. Aesthetically pleasing, well-maintained and activity-friendly residential environments that are not noisy and polluted, and meet the needs of different population groups (age groups, cultural groups) increase people's readiness to walk and cycle in the neighbourhood and use recreational facilities (e.g. parks, playgrounds) nearby the home *(23, 36-40)*.

In their studies, Giles-Corti et al. *(41)* demonstrated that people with good access to attractive and large public open spaces were 50% more likely to walk a lot. Recent findings using the LARES data also suggested that a pleasant residential area with only a few "incivilities" such as litter and graffiti may encourage people to exercise *(34)*.

In South Carolina, residents who live in neighbourhoods with well-maintained sidewalks and cycling routes were more likely to reach the recommended 30 minutes of physical activity a day *(42)*. Another American study found that women living in rural areas were more likely to be active if they reported attractive scenery close to the home *(43)*.

Accessibility to facilities for physical activity and open spaces

People are more likely to commute on foot or by bicycle, or to engage in recreational physical activity and exercise, when local infrastructures and places for physical activity are available and convenient (e.g. in terms of cost, time or distance). So-called "activity-friendly environments" make it easy to choose to be physically active, either through planned exercise or routine daily activity *(33)*. These are characterized by short distances (by foot or cycle) to facilities for outdoor or indoor physical activity, such as parks, playgrounds, green spaces, sports facilities, gyms or open spaces).

A systematic review by the US Task Force on Community Preventive Services *(44)* demonstrated that interventions to create or enhance access to places for physical activity (e.g. creating walking trails, or building or providing access to exercise facilities nearby) are effective in getting people to exercise more, and are therefore recommended for the promotion of physical activity at the population level.

A recent review by Krahnstoever Davison & Lawson *(26)* also suggested a significant positive association between the availability of recreation areas, parks and playgrounds in the vicinity of the home and children's physical activity.

A study in North Carolina showed that good access to places for physical activity and the existence of neighbourhood trails and street lights are positively associated with engaging in leisure activity *(45)*.

Density, mixed land use and street connectivity

Several studies have demonstrated that neighbourhoods with high residential density, land use mix and street connectivity are considered as more "walkable" *(28, 30, 46-48)*. Such "walkable" neighbourhoods are characterized by a mix of homes, food stores and public services, connected streets that provide convenient travel routes between destinations, higher densities, as well as availability of sidewalks and paths for walking and cycling *(33)*.

An Australian study *(39)* found that men and women who reported an increased convenience of walking facilities in their neighbourhoods were twice as likely to have increased their walking. Saelens et al. *(49)* reported in their study that residents of high walkable neighbourhoods engaged in approximately 70 more minutes of moderate-intensity to vigorous physical activity per week than did residents in less walkable neighbourhoods.

Two more recent resident surveys conducted in residential environments in Australia and the USA confirmed that availability of and short distance to public facilities and services and public transport (e.g. banks, businesses, shops) had a positive impact on walking*(50, 51)*.

Active transport

Sufficient opportunities for active commuting (walking, cycling) as well as access to public transportation increase people's likelihood of walking and bicycling in combination with using public transport facilities *(33, 40)*. Dense public transportation networks enable short distances to stations that make it attractive to walk or bike there. They also provide opportunities to moderately increase the walking or biking time by entering public transport systems only at the second-closest stop, which may provide additional 5 to 10 minutes of daily exercise as suggested by the German campaign "3.000 steps more each day" *(20)*.

Several urban design characteristics facilitate active transport. For example, a coherent path system including crossings for pedestrians and cyclists increase people's willingness for walking and bicycling for recreation or transport. Other main factors that positively influence non-motorized transport are density of people and services, and proximity to shops, schools, work, services and other destinations *(27, 48)*. For example, a grid street network that provides direct routes and safe connections for pedestrians and cyclists encourages people to commute on foot or via bicycle and use less the car *(29, 33)*.

Relationships between the residential environment and obesity

The evidence on the relationships between the built environment and weight status (overweight, obesity) is substantially smaller than the evidence on the links between the built environment and physical activity behaviour *(23)*. Nonetheless, a few more recent studies have suggested that there is an association between neighbourhood characteristics and the risk or prevalence of overweight and obesity.

Results from the WHO LARES survey showed that the risk for a higher BMI increases with the higher amount of incivilities and – for some cities – also with a smaller presence of greenery in the residential area *(52)*.

A cross-sectional study conducted by Catlin et al. *(53)* showed that the absence of outdoor exercise facilities, sidewalks as well as negative community perceptions (unsafe, unpleasant) are positively associated with being overweight. Boehmer et al. *(54)* reported in their study that the factors "far distance to recreational facilities, an unpleasant community for physical activity, not feeling safe from crime and traffic, and few non-residential destinations" were associated with being obese.

In an American study the comparison of overweight prevalence between high- and low-walkability neighbourhoods approached statistical significance, with 60% of low-walkability neighbourhood residents being overweight, but only 35% of high walkability neighbourhood residents being overweight *(49)*. Similar findings were observed in another US study: people who live in neighbourhoods with a mix of shops and businesses in walking distance have a 35% lower risk of obesity *(55)*. Correspondingly Lopez's study *(56)* suggested that urban sprawl is associated with an increased risk for being overweight and obese.

An earlier study by Wagner et al. *(57)* showed that in middle aged men walking or cycling to work was associated with lower weight and less weight gain, whether or not the men engaged in more vigorous forms of exercise.

The needs of specific population groups

Most of the current evidence on the linkages between the built environment and physical activity relates either to the adult population or to all residents in a defined neighbourhood area. Fewer studies have been conducted that examine how characteristics in the built environment affect physical activity behaviour, or even weight status, among other population groups. The following section outlines recent evidence on the relationships between the residential environment and physical activity with regard to children and adolescents, older people and the socially disadvantaged.

Children and adolescents

Recent research has confirmed that residential environments that support physical activity also positively influence physical activity levels in children and adolescents *(26, 36, 38, 58-64)*. Particularly important environmental determinants for physical activity behaviour among young people are:

- having access to indoor and outdoor facilities for sports and play close to the home (e.g. parks, playgrounds, green space, sports clubs and sports facilities in schools and kindergartens);
- perceiving the neighbourhood surroundings as interesting and friendly; and
- being able to walk or cycle to school or other destinations in safety.

Krahnstoever Davison & Lawson *(26)* found in their review of 32 studies (published between 1990 and 2006) that participation by children and adolescents (3–18 years of age) in physical activity is positively associated with publicly available recreational facilities and sports facilities in schools, as well as with the availability of an active transport infrastructure (presence of pavements, controlled intersections, access to destinations and public transport). At the same time, high traffic density and traffic speed, the need to cross numerous roads, and residential areas affected by crime and social deprivation were negatively associated with participation in physical activity among children and adolescents.

Mota et al. *(38)* reported that Spanish adolescents were more likely to be physically active when recreational facilities were available in the neighbourhood and when the residential area was aesthetically pleasing. Similar findings with regard to children's perception of the neighbourhood were found in Australia and the Netherlands. An Australian study by Hume et al. *(59)* suggested that open areas and green space in the vicinity of the home was perceived as important by 10-year-old children. Vries et al. *(36)* revealed in their Dutch study that physical activity among children (6–11 years of age) was significantly associated with their general impression of the "activity friendliness" of the neighbourhood and with the availability of sports fields and safe walking and cycling conditions (e.g. cycle tracks and 30-km/hour speed zones).

A study of adolescent girls in six United States communities demonstrated that perceived safety, the aesthetics of the environment (e.g. green areas, interesting things to look at, lack of garbage and litter), the availability of facilities for physical activity (e.g. sports equipment at home, cycling/walking trails in the neighbourhood), destinations within walking distance of the home and opportunities for active transport to school were important correlates of physical activity and active commuting to school *(60)*. Another American study demonstrated that children and adolescents aged 8–15 years living near a community park engaged in more moderate-to-vigorous physical activity per day (about 40 minutes) when their opportunities for sedentary leisure activities (television viewing, playing video and computer games) were reduced *(58)*.

It is also parents' perceptions that neighbourhood characteristics are relevant to children's physical activity. An Australian study *(61)* found that children aged 5–12 years whose parents had negative perceptions of facilities in the neighbourhood were less likely to use walking and cycling as a means of transport.

Older people

The body of evidence on links between the built environment and physical activity behaviour among older people is very limited. Some recent reviews and primary studies suggest that factors such as walkable distances to public facilities (businesses, stores, shopping malls) from the home, an activity-friendly, pleasant neighbourhood with opportunities for walking, the availability of recreational facilities (parks, walking and cycling trails) and a neighbourhood perceived as safe positively influence older people's physical activity behaviour. Such behaviour is mostly moderately intense physical activity such as walking for recreation and active transportation *(30, 65-69)*.

The positive impact of green spaces available for walking on the longevity of older people was measured by Takano et al. *(70)*. Having walkable green streets and spaces close to home had a significant positive influence on longevity among senior citizens in urban Tokyo.

A survey of elderly residents (mean age 74 years) in Portland, OR, United States revealed a relationship between several built environment factors (density, nearby green open spaces for recreation, number of street intersections, perception of safety for walking) and older people's walking activity in the neighbourhood *(30)*.

A study of older women in a community in Pennsylvania in the United States *(71)* showed that living within walking distance (no more than a 20-minute walk from home) of a park, a cycling or walking trail or shops and department stores was related to higher levels of walking activity.

Socially disadvantaged groups

People's socioeconomic status has shown to be an important predictor of physical activity and weight status. Opportunities for physical activity are often determined by individual socioeconomic status as well as the socioeconomic determinants in the neighbourhood where people live. Research evidence increasingly suggests that socially disadvantaged people and those who live in neighbourhoods of lower socioeconomic status (deprived areas) may have limited opportunities for physical activity. This is due to a reduced level of access to facilities for physical activity and to living in surroundings that are not conducive to physical activity (e.g. poorly maintained parks, housing and pavements, high levels of traffic and the threat of crime).

A recent study by Powell et al. in the United States *(72)* showed that commercial facilities for physical activity, such as physical fitness, sports and recreation clubs, dance halls and public golf courses, were less likely to be present in lower-income neighbourhoods and in those with higher proportions of racial minority groups. Gordon-Larsen at al. *(73)* also found that limited access to facilities among low socioeconomic status and minority population groups was associated with lower levels of physical activity and a higher prevalence of overweight.

A comparison of local areas in Melbourne, Australia showed that those living in the most socioeconomically disadvantaged areas were less likely to go jogging and to be sufficiently active to maintain their health *(74)*.

Estabrook et al. *(75)* compared neighbourhoods of different socioeconomic status (classified by employment status, per capita income, and the percentage of the population below the poverty

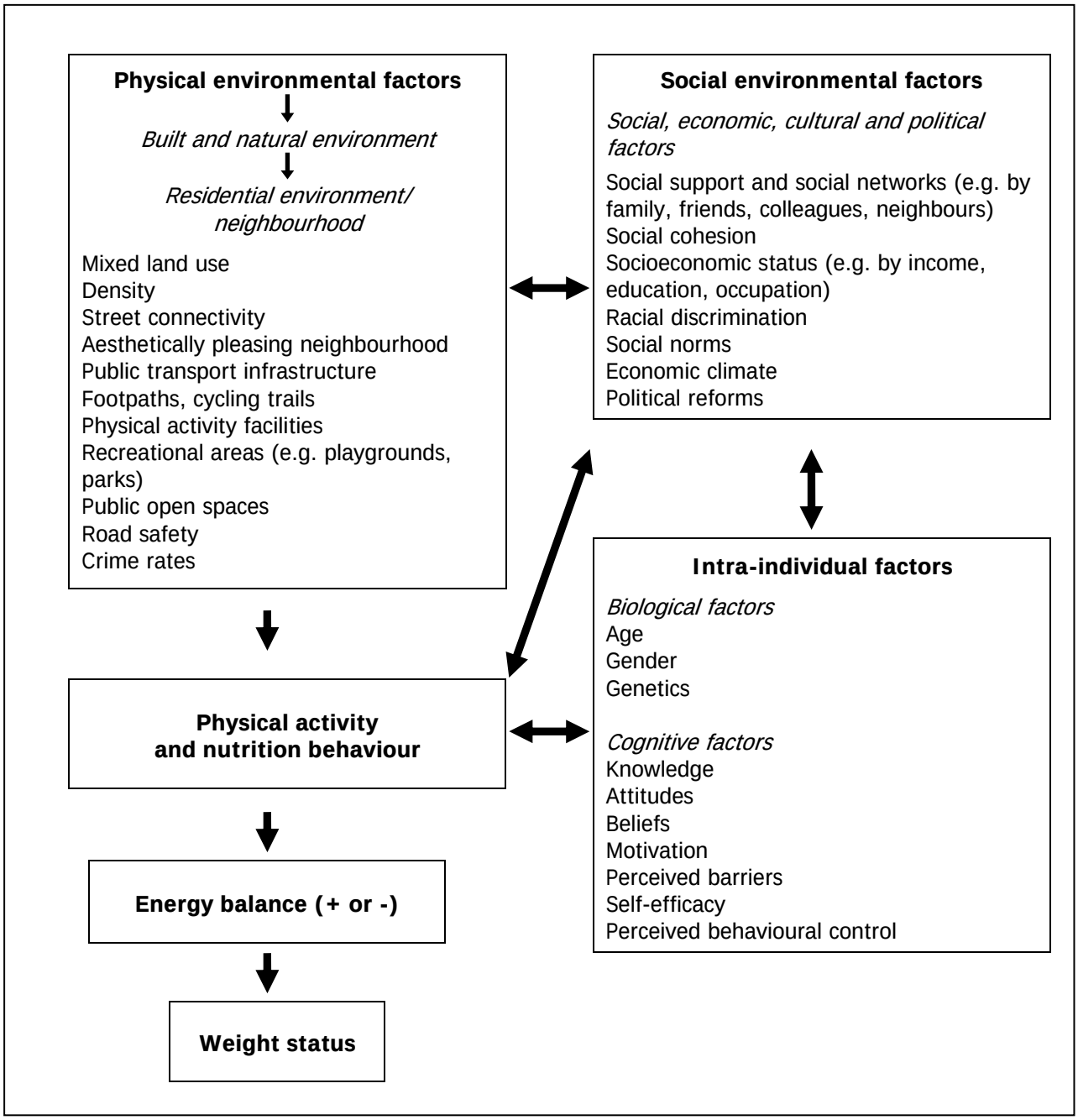
threshold) in a small midwestern city in the United States. Residents in neighbourhoods of low and medium socioeconomic status had significantly lower levels of access to free physical activity resources (e.g. parks, sports facilities, fitness clubs, community centres, walking/cycling trails) than those in neighbourhoods of high socioeconomic status .

Putting it together in a social ecological model

Social ecological models are used in the physical activity and public health arena to illustrate the relevant determinants that may affect physical activity behaviour and the risk of becoming overweight or obese *(23, 76-78)*. These models demonstrate that the links between the built environment, physical activity and obesity are complex, owing to the additional effects of social environmental factors (e.g. social support, social networks, social norms, socioeconomic status, economic and political climate) as well as intra-individual factors (age, gender, genetics, knowledge, attitudes, beliefs, etc.).

In Fig. 1 a social ecological model is proposed to illustrate the various influences on physical activity and nutrition behaviour, and consequently the risk of becoming overweight or obese. The model suggests that interventions to create residential environments that support physical activity are an important part of the solution to prevent and control obesity at the population level. They need to be complemented by strategies addressing the individual as well as social determinants of physical activity and nutrition behaviour.

Fig. 1. Social ecological model to illustrate the influences of the residential environment on physical activity and obesity



Source: Gebel et al *(23)*.

Secondary analysis of the European housing and health survey (LARES project)

A secondary analysis of the WHO LARES data was carried out to examine associations between residential environment and socioeconomic status factors on the one hand and physical activity (measured as sports/physical exercise) and BMI. The central research question was: What characteristics in the residential environment may enhance or inhibit physical activity and increase or reduce the risk for overweight and obesity? The extent to which individual socioeconomic status may affect physical activity behaviour and the risk for overweight and obesity was also examined. The analysis focused on the whole population as well as specific age groups (children and adolescents, adults and older adults).

Methodology

The cross-sectional LARES survey was conducted in 2002/2003 in eight European cities under the aegis of the WHO housing programme. The participating cities were: Angers, France; Bonn, Germany; Budapest, Hungary; Forlì, Italy; Vilnius, Lithuania; Ferreira do Alentejo, Portugal; Bratislava, Slovakia; and Geneva, Switzerland. Data were obtained from 8519 residents in 3373 households *(79)*. The overall database, however, provides no representative information either for the respective countries, for the EU or for the WHO European Region, but merely compiles the city data. Owing to this restriction and the wide diversity of housing and urban conditions in the eight cities, the data presented below can only provide an indication of associations between housing environments, physical exercise and obesity. In addition, response rates varied widely among the cities (range 30–75%), thus adding to the constraints on data analysis and interpretation.

The WHO LARES survey included three survey instruments:[1]

- an *Inhabitant Questionnaire* (administered by face-to-face interview) to examine residents' perception of and satisfaction with a variety of health-relevant characteristics of their home and immediate residential environments (e.g. availability of recreational areas, safety, transport infrastructure, aesthetics) as well as their socioeconomic status (e.g. household income, employment status);
- a *Housing Inspection Survey Sheet* (direct observation) to examine buildings and the immediate residential environment (e.g. technical equipment; quality, design and aesthetics of the dwelling and neighbourhood; and availability of green open spaces) in which people live; and
- a self-administered *Health Questionnaire* to collect data on residents' health status, including information on levels of sports/physical exercise and BMI.

Sampling strategy, sample size, response rate and cut points

The LARES data are not representative for each of the participating countries but provide a convenience sample of European cities covering northern, southern, eastern and western Europe. The sample size of the selected cities ranged from 600 (Ferreira do Alentejo) to 1700 (Budapest), with an average of 350–450 resulting household interviews.

Before the secondary analysis of the LARES data, cut points were defined for selected health risk factors, residential environment factors and socioeconomic status factors to be included in

[1] Further information on the LARES project can be found at http://www.euro.who.int/housing/activities/20020711_1.

the analysis. An overview of the cut points and variables used for analysis are presented in Annex 1.

Analysis

The analysis was undertaken in two steps. First, bivariate analyses and cross-tabulations were carried out to identify first associations between different variables. Specific attention was paid to associations between residential environment factors and socioeconomic status factors as causal factors, and sports/physical exercise and BMI as outcome factors. However, additional analysis steps considered sports/physical exercise as a causal factor for BMI.

Second, multivariate analyses were carried out involving two different approaches.

- Categorical principal component analysis (CatPCA) was used to structure the variables and to identify clusters within the data. CatPCA categorizes variables into groups based on similar characteristics. The CatPCA approach therefore provides a more general understanding of the data by breaking many detailed variables down into a few general ones.
- Logistic regression analysis was used to identify and assess the respective strength/relevance of individual factors (independent variables) for a selected outcome (dependent variable). Logistic regression provides information on which factors have a statistically significant effect on an outcome (e.g. BMI). The results provide an indication of the relevance of the independent variables.

Bivariate analyses

Before beginning multivariate analyses, several cross-tabulations were carried out to identify associations between residential environment and socioeconomic factors, and the outcomes of sports/physical exercise and BMI. The most relevant results of these bivariate analyses are presented below.

Associations of the residential environment with physical activity

The availability of a park or publicly accessible green space near the dwelling (within 100 metres) is associated with higher levels of sports/physical exercise (Table 1).

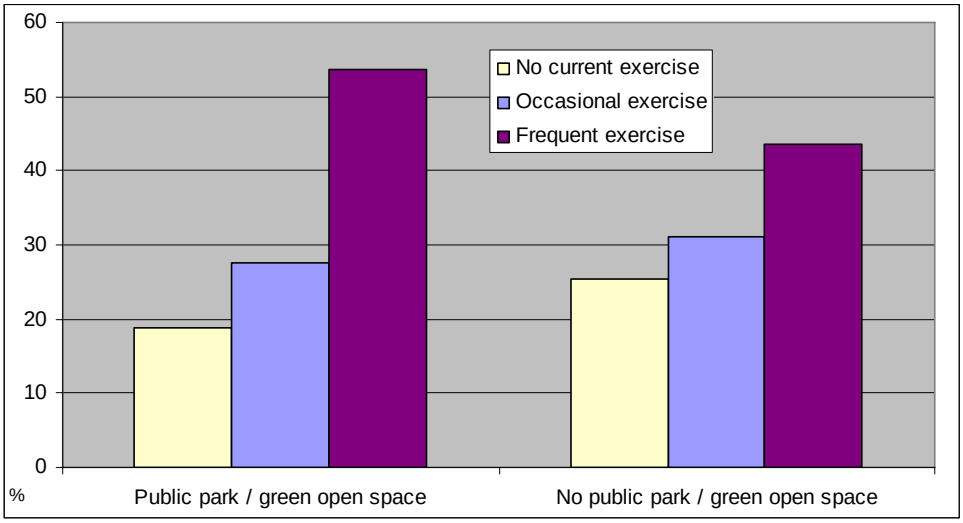
Table 1. Distribution of sports/physical exercise in the whole population (aged 2–80 years) by availability of a public park or green open space nearby

	Whole population		Park/green open space nearby	
	Percentage	n	Yes (%)	No (%)
No current sports/ physical exercise	41.8	3428	38.3	46.4
Occasional sports/ physical exercise	31.9	2614	33.2	30.2
Frequent sports/ physical exercise	26.3	2153	28.5	23.4

P <0.05.

Fig. 2 shows that this association is even stronger when looking at children only.

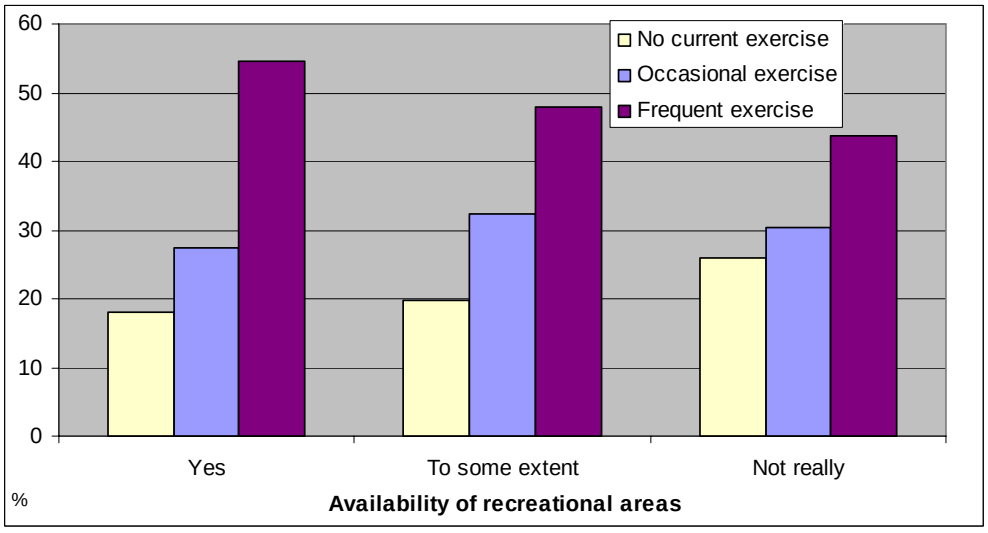
Fig. 2. Distribution of sports/physical exercise in children and adolescents (aged 2–17 years) by availability of a public park or green open space nearby



P <0.05.

Apart from green open spaces, the availability of recreational areas such as playgrounds and meeting places is relevant to the participation of children and adolescents in sports and physical exercise. Fig. 3 shows that fewer recreational opportunities are associated with less sports/physical exercise among children and adolescents.

Fig. 3. Distribution of sports/physical exercise in children and adolescents (aged 2–17 years) by availability of recreational areas



P <0.05.

Associations of the residential environment with BMI

Table 2 provides data on the availability of a public park or green open space close to the dwelling (up to 100 m) in relation to BMI categories. The availability of a park or green spaces close to the home is associated with a lower prevalence of overweight and obesity in the whole population (aged 2–80 years). However, these associations are less strong compared to the

associations of the availability of a park or green open spaces nearby the home with sports/physical exercise.

Table 2. Distribution of BMI in the whole population (aged 2–80 years) by availability of a public park or green open space nearby

BMI	Whole population		Park/green open space nearby	
	Percentage	n	Yes (%)	No (%)
Not overweight	60.3	4806	62.1	57.9
Overweight	28.3	2260	27.0	30.0
Obese	11.4	909	10.9	12.0

P <0.05.

The relevance of socioeconomic factors

Table 3 shows that adults with a high level of education are considerably more physically active than those with a low level of education.

Table 3. Distribution of sports/physical exercise behaviour by educational level (adults aged 18–80 years)

Level of sports/physical exercise	Total		Level of education		
	Percentage	n	Low (%)	Medium (%)	High (%)
No current	46.0	3106	73.6	44.1	28.6
Occasional	32.7	2207	15.0	34.6	43.1
Frequent	21.3	1434	11.4	21.4	28.3

P <0.05.

There is also a significant positive association of level of education with prevalence of overweight and obesity in adults. Overweight and obesity are particularly prevalent among those with a low level of education (Table 4).

Table 4. Distribution of BMI by educational level (adults aged 18–80 years)

BMI	Total		Level of education		
	Percentage	n	Low (%)	Medium (%)	High (%)
Not overweight	55.0	3614	32.8	56.1	63.2
Overweight	32.4	2130	42.3	31.8	28.1
Obese	12.7	832	19.5	12.1	8.7

P <0.05.

In relation to household income, the data show similar results (see Tables A1.5 and A1.6 in Annex 1). Population groups with a high income participate more in sports/physical exercise (only 26.2% do not actively exercise) compared to medium- and low-income groups (40.8% and 61.1%, respectively). There is also an association of income with BMI, which is expressed most strongly for obesity: low-income groups have a 15.1% prevalence of obesity compared with 7.8% in high-income groups.

Summary of bivariate analyses

Key findings from all bivariate analyses are summarized below. These include findings from the bivariate analyses presented above as well as those from additional bivariate analyses.

- Both sports/physical exercise and BMI are associated with age. Older people are more often overweight or obese than adults, who in turn are more likely to be overweight or obese than children or adolescents. The amount of sports/physical exercise decreases with age.
- Associations found between "hours out of dwelling", BMI and sports/physical exercise indicated that it was the fact of regularly leaving the dwelling that was important, rather than the amount of time spent away from home. People who leave their home for less than three hours per day are more obese and overweight and engage in less sports/physical exercise than those who away for more than three hours. In this context, the data showed that older people are away from home the shortest time, while adults stay out longer than children. Women are away from home for a shorter period of time than men.
- A higher level of education is positively associated with lower levels of overweight and obesity and higher levels of sports/physical exercise. The highest proportions of "not overweight" residents and of people engaging in regular sports/physical exercise are found among those with the highest level of education.
- A high household income is positively associated with engaging in sports/physical exercise. Members of high-income households are less overweight than those of low-income households.
- The associations with sports/physical exercise and BMI are weaker for residential environment variables than for socioeconomic variables. The associations identified are stronger for sports/physical exercise than for BMI. Nevertheless, some trends can be found, such as:
  - residents tended to be more active in their neighbourhood when they perceived it as safe; and
  - people living close to a park or green open spaces were less overweight and obese and were more likely to engage in sports/physical exercise than those who did not live close to such facilities.

  Nevertheless, as the analyses were carried out from a cross-sectional data set, these associations are affected by uncertainty as to their causality. For example, residents in green neighbourhoods may be more motivated to spend time outside; on the other hand, people who wish to engage in outdoor physical or social activities may elect to live in precisely such neighbourhoods.

Multivariate analyses

Categorical principal component analysis (CatPCA)

CatPCA aims at grouping variables that have common characteristics and can be categorized accordingly. It thereby provides a more structured overview of the data and identifies variable groups within which the variables show a strong correlation with each other.

In a first version of CatPCA, all variables that are supposed to be relevant from a theory-guided point of view were used. These included a number of residential environment, socioeconomic and person-related variables.

The selected variables provided a total of four principal components (Table 5).

1. The first component may be interpreted as the influence of "urban problems", such as lack of green space and more litter in the housing environment.
2. The second component relates to the availability of "recreational spaces to be physically active" in the residential environment.
3. The third component represents "youth-related characteristics" such as age, level of education and marital status.
4. The fourth component describes "material wealth" and economic aspects.

Thus components 1 and 2 describe the residential environment conditions, while components 3 and 4 describe socioeconomic characteristics.

Table 5. Results of categorical principal component analysis

Component 1: urban problems (versus no urban problems)	
Type of neighbourhood	Amount of litter
Location of the surveyed housing	Dog droppings
Steps or staircase inside the dwelling	Annoyance by litter and rubbish
Open or green space that belongs to the building	Vegetation on public grounds [a]
Graffiti	Vegetation on private grounds/gardens [a]
	Feeling safe returning home after dark
Component 2: no recreational spaces to be physically active (versus having space)	
Vegetation on public grounds a	Enough recreational areas for children
Vegetation on private grounds/gardens a	Enough recreational areas for teenagers
Vegetation on facades/balconies/windows	Enough recreational areas for the elderly
Park or green space accessible to the public	
Component 3: youth-related characteristics (versus old age)	
Age group	Educational level
Marital status	Employment status
Component 4: material wealth (versus poverty)	
Problems in paying household expenses	Income groups

[a] Both variables showed a strong association with components 1 and 2.

The four components shown above do not contain all variables entered into the CatPCA. The variables that could not be related to a specific category were:

- gender
- dwelling well connected to city centre
- public transport to reach city centre

- walking to reach city centre
- bicycle to reach city centre
- private car to reach city centre
- dwelling owned or rented.

With these four components, further analysis was undertaken: the components were applied as individual variables and made it possible to compare the relevance of the four components (statistically also called "factors"). Each factor or component includes the number of variables as listed above and thereby serves as a more general data element. Using the CatPCA factors is therefore a way of considering all the variables listed in Table 5 without using a model that loses clarity owing to a high number of input variables.

Impact of the residential environment on physical exercise

It was first determined whether the four CatPCA factors influence the intensity of engaging in sports and being physically active, using multiple linear regression models. The detailed results of this analysis can be found in Table A1.7 of Annex 1.

The main finding is that, even when controlling for the socioeconomic factors ("youth-related characteristics" and "material wealth"), the lack of neighbourhood areas for sports/physical exercise ("no recreational spaces") shows a negative influence on sports/physical exercise. "Urban problems", which is the other housing environment factor, does not have a significant impact in this model. On the other hand, both "youth-related characteristics" and "material wealth" have a positive influence on being physically active and engaging in sports. "Youth-related characteristics" show the strongest results, indicating that age is the main factor affecting physical exercise. However, the relevance of recreational areas is of considerable importance and even slightly stronger than the economic situation of the resident(s).

Impact of the residential environment on BMI

The second linear regression model tested the influence of the CatPCA factors on overweight and obesity. Full details can be found in Table A1.8 of Annex 1.

The results indicate that a lack of areas for exercise and activity ("no recreational spaces") increases BMI, while "youth characteristics" and "wealth" reduce the BMI value. Again, "urban problems" does not have a significant influence on BMI compared with the other factors.

As physical exercise is a key factor for BMI, this variable was also entered into a second model and showed a strong negative impact on BMI, weakening the impact of the other three factors ("no recreational spaces", "youth-related characteristics" and "material wealth") considerably. Nevertheless, all these three factors remained significant.

In conclusion, age remains the key factor for BMI and shows – in contrast to the results on sports/physical exercise – by far the strongest power. The other factors are less strong and – in contrast to the model for sports/physical exercise – "material wealth" is more relevant than "no recreational spaces". The impact of the residential environment on BMI is therefore statistically less expressed than its impact on sports/physical exercise.

Logistic regressions

The second multivariate analysis approach focused on the individual variables as they were used in the original questionnaire, and enables the relevance of individual variables to be identified rather than aggregated components. In addition, for each variable it is possible to provide an

odds ratio, which quantifies the chance that a certain variable is associated with sports/physical exercise in a positive or negative way.

Using the pre-selection of variables provided by the CatPCA described above, the following variables (including all response categories) were included in the logistic regressions:

Socioeconomic characteristics

- Age group
- Educational level
- Income groups
- Problems in paying household expenses

Environmental characteristics

- Type of neighbourhood
- Location of the surveyed housing
- Steps or staircase inside the dwelling
- Open or green space that belongs to building
- Graffiti
- Amount of litter
- Dog droppings
- Vegetation on public grounds
- Vegetation on private grounds/gardens
- Vegetation on facades/balconies/windows
- Park or green space accessible to the public
- Enough recreational areas for children
- Enough recreational areas for teenagers
- Enough recreational areas for the elderly
- Feeling safe returning home after dark

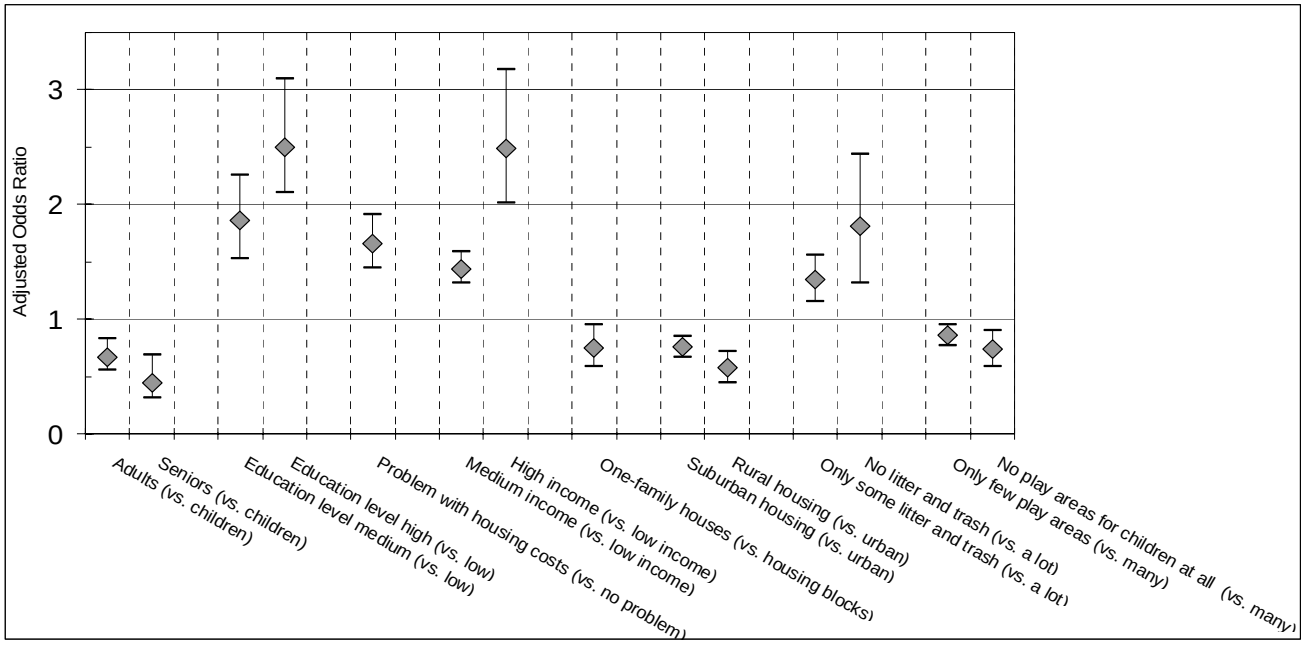
In addition, all regression models included the variables on marital status, employment status and the socioeconomic status score of the household (based mainly on non-financial household characteristics such as housing tenure, housing size and family composition) to account for the potential influence of these factors.

Impact of the residential environment on physical activity

For the purpose of the analysis, the variable "sports/physical exercise" was transferred into a dichotomous format ("never or only occasionally do sports/physical exercise" versus "frequently do sports/physical exercise"). For this sports/physical exercise outcome (dependent variable), the relevance of a variety of environmental, personal and socioeconomic variables (independent variables as listed above) was tested. The LARES database provided the required data for 5764 residents (up to 80 years of age).

Only a few variables in the model were proven to show significant associations with sports/physical exercise (Fig. 4).

Fig. 4. Statistically significant associations between socioeconomic and environmental factors and physical activity



The results show that individual and socioeconomic variables are the most relevant factors influencing sports/physical exercise behaviour. Although some residential and environmental factors are also significant, they are less expressed than the person-related factors.

The strongest results affecting sports/physical exercise behaviour are found for educational level and income – the higher the education and/or income, the higher the chance that a person will engage in physical exercise. Problems in paying household expenses are also an important factor but are less expressed than education or income. Naturally, increasing age reduces the level of sports/physical exercise.

Looking at environmental factors, one-family homes (compared to housing blocks) are associated with a lower level of sports/physical exercise, most likely caused by the location of the housing: in rural and suburban areas (where one-family homes are usually located), sports/physical exercise behaviour is significantly less expressed than in the city centres, which may indicate an increasing use of private means of transport such as cars.

Spaces to play and be active are especially relevant for children, and the data show that a lack of such spaces is associated with a reduced odds ratio of 0.74 for sports/physical exercise in children.

Within the environmental variables, aesthetics and impression play a major role: less rubbish and litter in the residential area is positively associated with residents engaging in more sports/physical exercise, resulting in an odds ratio of 1.81 indicating increased levels of sports/physical exercise for people living in the cleanest areas.

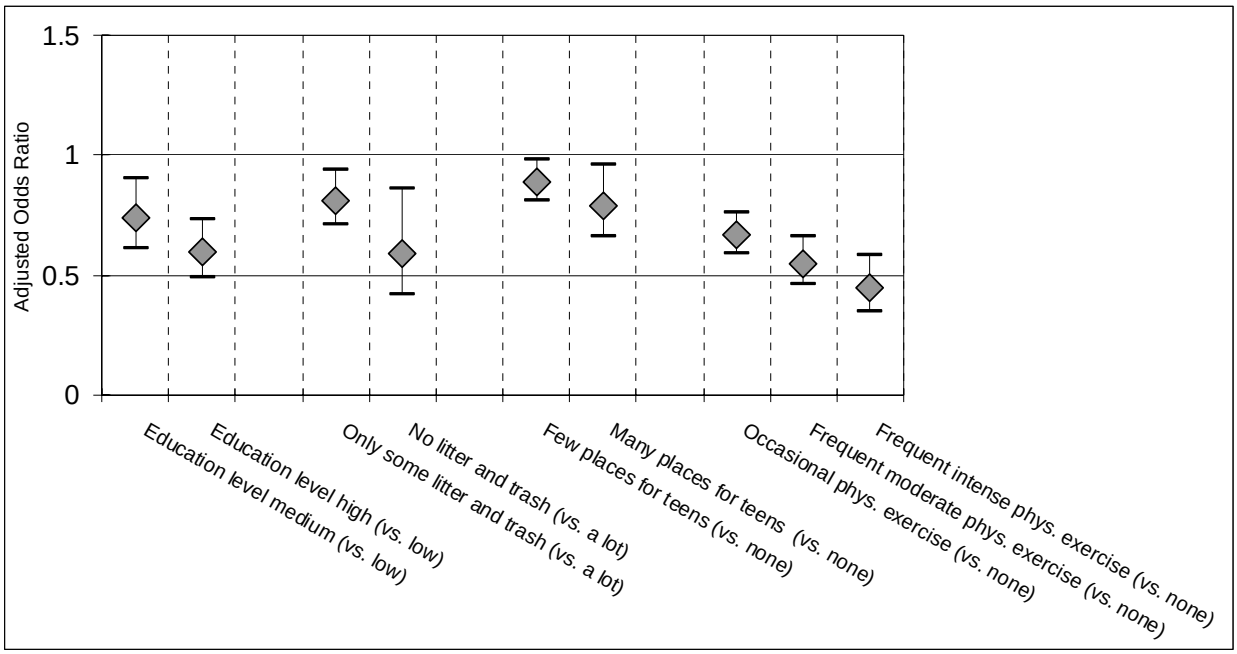
Impact of the residential environment on BMI

For the purpose of the analysis, the variable “BMI” was transferred into a dichotomous format (“not overweight” versus “overweight and obese”). For this outcome of overweight and obesity (dependent variable), the relevance of a variety of environmental and socioeconomic variables (independent variables as listed above) was tested. In addition, this regression model included

the variable "sports/physical exercise", as it is one of the most relevant for BMI. The LARES database provided the required data for 5536 residents (up to 80 years of age).

Again, most variables did not provide a significant association with BMI in the regression model. The four variables giving significant results are shown in Fig. 5.

Fig. 5. Statistically significant associations between socioeconomic and environmental factors and BMI (overweight/obesity)



Looking at the variables related to the personal characteristics of residents, only educational level showed a significant impact on overweight and obesity, indicating a protective effect of high compared to low level of education (odds ratio = 0.6). Age did not provide a significant outcome, and it is possible that the effect of age is to a large extent covered by the included "sports/physical exercise" variable. Also, the income – strongly expressed for sports/physical exercise as an outcome – does not provide a significant result in this model.

Two of the selected environmental variables show a significant association with BMI. As for sports/physical exercise, the presence of litter and rubbish seems to affect BMI as well as the availability of recreational areas for teenagers (in contrast to the model for sports/physical exercise, where the recreational areas for children were of relevance). However, it is possible that – despite socioeconomic variables being part of the model – these results are affected by residential selection processes (affluent households moving into nicer neighbourhoods).

Finally, the variable on physical exercise provides the most significant result. The protective value of sports/physical exercise does increase with the degree of activity, indicating that frequent intense exercise can halve the probability of being overweight or obese. However, the key message for public health and physical activity promotion should perhaps be that occasional exercise also provides a significant benefit and can reduce the risk of being overweight or obese (odds ratio 0.67).

In conclusion, it seems that in this model "sports/physical exercise" explains the largest part of BMI, and therefore other variables are less powerful. In addition, it must be noted that the outcome for this analysis was "overweight and obesity", which may have diluted the results to

some extent. It is possible that for several variables stronger results could have been obtained if only "obesity" had been used as the outcome to be tested.

The two logistic regression models provide a very similar general picture, indicating that – in general terms – individual and personal characteristics are more relevant for sports/physical exercise and BMI than the housing environment. Nevertheless, a number of environmental factors seem to play a role by (not) providing adequate and pleasant environments that can host and thereby facilitate sports/physical exercise. Therefore, residential environments may play a crucial role by providing recreational opportunities to those who want to be active.

For BMI, the effect of the residential environment is lower. This is probably due to the number of factors affecting BMI, which could not be all added to the model (e.g. nutrition). In addition, the inclusion of physical exercise/sports reduced the relevance of the individual characteristics such as age and income (not significant for BMI) and educational level (less strongly expressed).

Overall conclusion of analyses

The results obtained from the secondary LARES analyses can only provide indications of potential associations between residential environments, physical exercise and BMI, based on a convenience sample of eight European cities. Nevertheless, they are based on a large international database on housing and health and benefit from a consistent methodological background, allowing the derivation of conclusions that could be valid for many other European cities.

Both analytical approaches provided consistent results and indicate that sports/physical exercise can be promoted, supported or possibly enhanced by activity-supportive residential environments. Two key results can be identified.

- The availability of spaces for recreation and sports/physical exercise is a suitable strategy through which the residential neighbourhood can positively affect sports/physical exercise behaviour. Apart from the availability of such spaces, the quality and the aesthetics of those places plays a role as well.
- Individual characteristics (especially age but also income and education) are the driving force for sports/physical exercise behaviour, which need to be complemented and supported by the residential environment. To initiate sports/physical exercise behaviour by itself – which is the major challenge for public health – the quality of the residential environment alone is not sufficient. Therefore, the impact of residential environments on sports/physical exercise should be an approach considered and covered by public health interventions and campaigns, but it can not be an effective approach in itself.

European review of interventions to create residential environments that support physical activity

From September to November 2006, the WHO European Centre for Environment and Health (ECEH), Bonn Office carried out a European review of interventions to create residential environments that support physical activity. As a result, eight European case studies of good practice in this area were identified and compiled. These case studies, together with current evidence from the literature on the relationships between the residential environment, physical activity and obesity were presented and discussed at an expert meeting convened by the WHO ECEH Bonn Office on 29–30 November 2006.

Pan-European consultation process and case study collection

European experts engaged in research, policy and practice in the areas of physical activity and public health, environment, landscape architecture, urban planning and housing were consulted to identify case studies of good practice in creating residential environments that support physical activity. The experts were from research institutions, national and local government, and nongovernmental organizations.

A total of 63 stakeholders were contacted directly; others were consulted via various networks: the European network for the promotion of health-enhancing physical activity (HEPA Europe), the Transport Health and Environment Pan European Programme (THE PEP) and national networks. Telephone and e-mail communications with 43 stakeholders resulted in the selection and compilation of eight detailed European case studies.

The consultation process involved a three-step approach *(80, 81)*.[2]

1. Key stakeholders in the WHO European Region were identified and listed using contacts in WHO, ministries, nongovernmental organizations and research institutions in sectors such as health, sports, education, environment, housing, urban planning and landscape architecture.
2. Identified stakeholders were consulted by e-mail and/or telephone and were sent one of the following documents for information and data collection.
   - An *initial consultation letter* was sent, including background information on the project. Stakeholders were asked to send any relevant information or contacts related to interventions in Europe (e.g. creation or improvement of walking/cycling trails, pavements, physical recreation and sports facilities, open and green spaces, aesthetically pleasing neighbourhoods, mixed land use, and safety from road traffic and crime).
   - A *follow-up letter* was sent, including a detailed questionnaire on identified interventions in relation to several aspects of the intervention (time frame, population level, setting, target group, intervention approaches, stakeholders, funding, political commitment, evaluation, success factors, challenges/barriers, key experiences, and the sustainability and transferability of the intervention).

[2] This methodological approach was adapted from previous successful projects that included stakeholder consultations and case study collection carried out by WHO and other international partners: (*a*) a case study collection carried out by the WHO Regional Office for Europe's Transport and Health Programme on cross-sectoral collaboration with physical activity promotion; (*b*) a case study collection carried out by the Regional Office's Children's Health and Environment Programme on action strategies to improve children's health and environment in the European Region; and (*c*) a case study collection on best practice in interventions to promote physical activity in developing countries, carried out by the University of Sydney Centre for Physical Activity and Health for WHO headquarters and the WHO Kobe Centre in Japan.

3. Eight European case studies of good practice were compiled, based on the information received from the key stakeholders. This included writing, editing and approval of the case studies from the stakeholders involved in the intervention planning and implementation.

The case studies are presented in Annex 2. In general, the pan-European consultations revealed an increasing number of observational studies that examine the relationships between the built environment, physical activity and obesity.

The following case studies were selected:

- Trekroner – A New Residential District Designed for Physical Activity, Denmark;
- Kerava Neighbourhood Sports Facility Project (KERNES), Finland;
- Movement as Investment for Health, Germany;
- Moving Kids – Physical Activity Promotion in Designable Environments; Germany;
- The Dings Home Zone and Cycle-walkway, United Kingdom;
- Winsford BMX Track and Skate Park, United Kingdom;
- Community Environment Programme, United Kingdom; and
- Spen Valley Greenway, United Kingdom.

The collection of case studies showed that there are many more interventions or initiatives at the local level (municipality, community, neighbourhood) that facilitate physical activity in the neighbourhood (e.g. creation and improvement of playgrounds, parks, physical activity facilities, footpaths, cycling trails and aesthetically pleasing neighbourhoods)., only a few such interventions involve process and outcome evaluation, however (e.g. in terms of impacts on physical activity behaviour and health, as well as economic and social impacts), and very few are reported in the public health or urban planning literature.

Expert meeting "Tackling obesity by creating healthy residential environments"

With support from the German Federal Ministry of Health, the WHO ECEH Bonn Office convened a WHO technical meeting on "Tackling obesity by creating healthy residential environments" on 29–30 November 2006 in Bonn. The participants included European experts in the fields of science, policy and practice (see Annex 3).

The purpose of the meeting was to discuss the current evidence from the literature as well as the selected European case studies on creating residential environments that support physical activity. The specific objectives of the meeting were to:

- summarize the current evidence on the relationships between the residential environment, physical activity and obesity;
- review and discuss selected pan-European case studies on improved residential environments conducive to participation in physical activity and reduction of obesity; and
- provide conclusions and recommendations for suitable approaches to creating such environments.

The following sections provide a summary of the discussions and conclusions of the meeting.

Residential environmental factors that support physical activity and health

The participants agreed that the following residential environment factors have a positive impact on physical activity behaviour and health. These factors are consistent with current research evidence on the links between the residential environment and physical activity behaviour published in the areas of physical activity and public health, sports and exercise, housing, urban planning, transport and landscape architecture.

Safety
Perceived road safety (e.g. a low volume of traffic, speed limits and the availability of pedestrian crossings and pavements) and security from or no fear of crime (e.g. owing to sufficient street lighting or low crime rates) are associated with people's readiness to walk and cycle in an area.

Destinations and opportunities
Short, walkable distances to physical activity facilities (e.g. parks, playgrounds, green spaces, sports facilities, open spaces) as well as city/town centres (e.g. shops, public places) enable people to become more physically active.

Aesthetics
Aesthetically pleasing, well-maintained and interesting environments that meet the needs of different population groups within a residential area increase people's readiness to walk and cycle in the neighbourhood and use recreational facilities.

Accessible, convenient and coherent infrastructures/places
People are more likely to commute on foot or by bicycle and engage in recreational physical activity when local infrastructures and places are easy to access, convenient (e.g. in terms of costs, time and distance) and coherent.

(Optimal) density
Density relates to development and population per unit area. As density increases, time and distances for travel between destinations tend to decline and people are more likely to walk or cycle and to use public transport (active commuting).

Mixed land use
A diverse land use mix includes residential, commercial, industrial and agricultural environments within a certain area and is associated with shorter travel distances, which, in turn, have an impact on physical activity.

Street connectivity
A street network that provides direct and safe routes between destinations for pedestrians and cyclists (non-motorized transport) is associated with physical activity. Connectivity is determined by the types of intersection and density in a given area.

Facilities for walking and cycling
Coherent path systems, including crossings for pedestrians and cyclists, increase people's likelihood of walking and cycling for recreation or commuting.

Active and public transport
Sufficient opportunities for public transport increase people's likelihood of walking and cycling in combination with their use of public transport facilities (active transport).

These environmental factors were considered as having a positive impact on physical activity behaviour and health. More evidence is needed (e.g. from measurement studies) on how each factor explains physical activity behaviour and how these factors interact.

For the European Region, it remains unclear what the ideal level of density would be to support physical activity behaviour, since too high a population density might have a negative influence on physical activity (e.g. high-density urban districts may only provide a few parks, playgrounds, or green spaces or open spaces). Most of the current evidence has been produced in Australia, Canada and the United States, where urban sprawl is very common. This raises the question of whether such evidence is applicable to the European region, and more specifically whether study findings would be different if the same studies were carried out in Europe.

Interventions to create physical activity supportive residential environments

The selected case studies were presented and discussed as examples of good practice in Europe. During the discussions, the following points were considered by the experts.

Intervention approaches

What kind of intervention approaches should be implemented to create residential environments that support physical activity?

The relationships between characteristics in the residential environment and obesity are complex, and both physical activity and nutrition-related factors should be taken into account in interventions to combat obesity. Intervention approaches should focus on providing opportunities for physical activity during the different seasons, at different times of the day, and both indoors and outdoors.

The following intervention approaches could be pursued.

- Healthy and affordable food should be made available in the residential environment. An option is to locate shops selling healthy food within walking or cycling distance of homes.
- Schools are important settings in the neighbourhood and good venues for physical activity facilities. Schools should be included in any environmental interventions, for example through the provision of physical activity facilities, playgrounds, improvement of school grounds and opportunities for active commuting. School yards should be made attractive to children so that it is more interesting to be active outside than staying inside using a computer or watching television. Physical activity facilities (indoor and outdoor) based on school yards should be made accessible to whole the community. Moreover, physical education in schools may include a component to identify children's opportunities for physical activity (play, sports) in the residential area.
- Open spaces and facilities that support physical activity should be provided.

Objectives

What could be the objectives of interventions?

The objectives of environmental interventions could be to:

- promote daily physical activity rather than sports *alone*, as most people are not able to engage in sports every day;
- create better places to live and grow up (healthy neighbourhoods), which relates to the promotion of physical activity for health including a holistic concept of health (e.g. social health, social cohesion);

- motivate people to become active (e.g. through the provision of indoor and outdoor physical activity facilities that suit all seasons and weather) and thereby help people increase control over their physical activity and health (empowerment approach); and
- make existing physical activity facilities accessible and provide new facilities.

Target groups and channels

Which population groups in the residential neighbourhood should be targeted by environmental interventions? Should specific population groups in specific residential areas be targeted rather than the whole population?

Increasing levels of physical inactivity and obesity affect all population groups. Thus while interventions should be aimed at the whole population, they should also target specific population groups (e.g. children, teenagers, older people and the socially disadvantaged and underprivileged). The aim of interventions should be to reach the least active population groups as far as possible.

Different population groups have different needs. For example, children enjoy playing outside but older people may not like what they deem to be excessive noise or risk of damage to property associated with children's play. The different population groups should be brought together during the planning and implementation phase of an intervention to discuss competing interests related to changes in the residential environment. Existing social infrastructures at the community level should be used in approaches to bring different population groups together (participatory approaches).

How could target groups be identified and reached?

Target groups could be identified in various ways such as:

- population-based screening measures (e.g. health surveys)
- definition of a geographical area in the residential environment.

To reach target groups, a suitable approach may be to assess the lifestyles of residents within a defined geographical area, and to identify the lifestyle determinants that promote physical activity opportunities in that area. A so-called assets assessment of existing resources within a residential area could be conducted with local experts (e.g. social workers) to identify individual, social, institutional and infrastructural resources within the residential environment. Then, in-depth interviews, focus groups or special events (e.g. launch of a new footpath) could be conducted to reach the target groups. In general, participatory approaches during the planning and implementation are paramount in reaching and engaging with the target population.

Stakeholders

How important and effective is it to involve residents in the planning and implementation of the intervention?

The involvement of residents (target groups) is crucial for empowerment and improves the efficient integration of local neighbourhood conditions into intervention planning and implementation . For example, the impact of the residential environment on physical activity behaviour is very complex owing to various interacting physical, social and cultural factors. The involvement of residents (participatory approach) could help uncover such local infrastructures and determinants that may influence people's physical activity behaviour in a residential area (e.g. cultural barriers faced by specific cultural/religious groups, social barriers owing to crime or a lack of a common identity and social activities, or physical barriers owing to a lack of or poorly maintained open spaces).

Sometimes there are competing interests among people of different age groups on how a residential area (re)designed. These should be considered in the planning and implementation of interventions to change the residential environment. For example, children may lose their natural spaces for playing when these spaces are refurbished with the aim of "improving" them from an adult point of view. Involving all target groups in the planning process ensures that all interests are identified at the planning stage. However, the meeting participants also underlined that a participatory approach does not guarantee the achievement of project goals.

How important and effective is it to involve different sectors in the planning, funding and implementation of an intervention?

The transport and urban planning sectors should be involved in interventions, with the aim of promoting public transport and active commuting.

Civil servants in different governmental departments/sectors should cooperate with each other, and there should be horizontal partnerships at the local level. A civil servant alone would not be effective in implementing environmental interventions; a group of stakeholders is needed that is motivated to create environments supportive of physical activity.

Private sector organizations should also be involved in interventions. However, partnerships with companies in the fast food industry may be problematic, as such cooperation may improve the image of companies that cause health problems. The main purpose of some companies funding physical activity interventions (or health promotion interventions) may be to improve the company image rather than to promote physical activity. Stakeholders in the area of physical activity promotion should be clear as to:

- the purpose of any private sector involvement;
- where funding from private sector companies goes; and
- the motives of private sector companies in becoming involved and whether these motives are in line with the purpose of the project.

In general, project coordinators/researchers should weight up what is more important: (*a*) receiving funding from private sector companies that are seen to be a cause of the obesity issue, thereby contributing to raising their image; or (*b*) not working with such companies at all and thus losing opportunities for funding. An option is to set up partnerships with private-sector companies that are based on the terms of the project coordinators/researchers.

Funding

What are the challenges and success factors regarding the funding of interventions?

Funding is often provided for too short a term for an intervention to show any effect. In such cases, successful partnerships or local networks set up for an intervention are in danger of disappearing when funding runs out.

Interventions/projects are often funded through special (research) grants rather than through ongoing budgets. But if interventions prove successful they should be funded through regular, long-term budgets and be incorporated into the existing local infrastructures/administration.

Initial funding is needed to start an intervention. Ongoing funding is required after the initial results become available. Local organizations should be identified that may provide long-term funding or subsidies (e.g. governmental organizations).

A broader, long-term vision, such as a national physical activity strategy, would help carry out longer-term projects and ensure ongoing project funding.

Political commitment

Political commitment is crucial for the successful implementation of interventions to create residential environments that support physical activity. As some European case studies have shown, political commitment dramatically facilitates the initiation, implementation and sustainability of interventions.

What kind of political commitment is needed?

Political commitment at the national as well as at the local level is needed to boost the implementation of local environmental interventions and facilitate the adoption of grass-roots ideas. Political commitment may be provided in the following ways:

1. through a statement (e.g. a recommendation or government resolution) stressing that physical inactivity and obesity are important public health issues (however, if such statement does not involve funding, laws or regulations it may be the weakest solution);
2. through the introduction of a law or regulation that affects action/bureaucracy at municipal level on how to implement interventions supportive of physical activity; and
3. through 1 or 2 above but including additional funding.

How can political commitment be achieved?

The implementation of interventions is most likely to be effective when top-down political commitment is combined with grass-roots initiatives. Local organizations (e.g. municipalities) often need a national assignment in order to act. The participants agreed that the following factors may help achieve political commitment:

- Provide topics that matter to politicians. This may include the use of other public health issues (e.g. health inequalities, the health of future generations) to stress the importance of interventions to create environments that support physical activity.
- Use participatory approaches.
- Use economic arguments. An economic argument may be one that stresses that health promotion is cost-effective and healthy, or that environments that promote physical activity are relevant both to people's health and the public health budget. Another economic argument might be that aesthetically pleasing, healthy residential environments could attract more taxpayers to an area and thereby contribute to an increase in the regional tax income.
- Link the public health issue (e.g. obesity, physical inactivity) to other existing legislative and planning procedures, such as environmental impact assessment or health impact assessment. Such impact assessments may make politicians aware of the public health aspects of obesity and physical inactivity, and may prompt them to take measures to counteract them.
- Promote a change in the social and political climate that requires politicians/decision-makers to make a political commitment.
- In the long term, vote for parties and politicians that are likely to introduce measures related to the advocated public health issue.
- Bring together four groups of key stakeholders: national level players (e.g. politicians), city civil servants (e.g. mayors), residents, and independent catalysts (e.g. academics, community leaders). The latter may have important contacts with politicians, the media or researchers who could push initiatives/interventions on the political agenda. A key player should be well-known, have a positive image, have a thorough knowledge of the local situation, have

informal relationships with other key players, decision-makers and networks, know the current political agendas, and be skilled in initiating action at the right time and in approaching relevant stakeholders.

- Use the media to inform the public on a public health issue, thereby bringing the issue on to the political agenda.

Evaluation

What kind of evaluation should be carried out to see whether interventions are successful?

In general, evaluation should be planned during the intervention planning process. About 10% of the total project budget should be spent on the evaluation of an intervention.

Ideally, interventions should involve both process and outcome evaluation. The best available evidence should be collected, using both qualitative and quantitative data. Interventions should always include process evaluation and report participation in the intervention, as it is important to measure not only health and economic outcomes of an intervention but also the key issues that arose during project implementation.

There is a difference between research-driven evaluation projects and simple practice-oriented evaluations. More interventions need to include some basic, practice-oriented evaluation. Ideally, experts (researchers) should be involved in the evaluation from the beginning of project planning and implementation so that the evaluation is tailored to the project.

All project stakeholders should be brought together in the planning of an evaluation so that all stakeholders' agendas in regard to the evaluation are taken into account. Commissioning an independent body to conduct the evaluation may be appropriate, to ensure that all stakeholders' agendas are considered in the evaluation.

Existing national monitoring infrastructures (e.g. national health surveys) may be used for measuring intervention outcomes, such as changes in physical activity behaviour. However, a small-scale intervention should include process evaluation and should report participation in the intervention.

What are the barriers/challenges for evaluation?

Evaluation is often carried out by people working on multiple short-term projects, with limited funding and time to make the evaluation and disseminating its results. They may also have difficulty in understanding what evaluation means and what evaluation tools are most suitable for evaluating an environmental intervention. In small-scale interventions, there can be disagreement as to the proportion of the funding that should be allocated to the implementation itself versus its evaluation.

Residents may not be interested in getting involved in evaluation activities; they may see them as too time-consuming, not important or useful, or as too burdensome and repetitive.

Another potential barrier is that evaluation findings may not meet the expectations of those involved (i.e. the results may not show what was wanted). Also, evaluation is often determined by the agendas of funding partners or key stakeholders. This may mean that evaluation is sometimes simply not requested, or may not focus on physical activity and health outcomes.

What evaluation tools could be used?

Mixed methods approaches (quantitative and qualitative, objective and subjective) are recommended in carrying out process and outcome evaluation, and in facilitating triangulation of

findings. The coordinators of an intervention should be given guidance on which evaluation tools are available and suitable for the needs and specificities of an intervention. Partners responsible for evaluation should draw from a broader base of theories, to inform best practice and optimum choice of evaluation tools. Evaluation activities could be integrated with planned or mandatory environmental and health impact assessments.

Success factors and challenges

What are the factors leading to successful implementation?

Participatory approaches
Key community residents and project partners should be involved in the planning and implementation of an intervention, in order to ensure its success and sustainability. Children and adolescents are an important group to be involved, particularly if they will be the main users of physical activity facilities and open spaces in the residential area. If they are not involved in the planning and implementation of interventions, physical activity facilities might be built from the adult point of view and thus actually reduce opportunities for children and adolescents in the neighbourhood.

Win-win approaches
Sustained partnerships with key community leaders and politicians, including mutual learning processes and win-win approaches, may help engage different stakeholders and sectors in interventions.

Educational approaches
In addition to building residential environments supportive of physical activity, classic health educational approaches may sometimes be needed in order to point out to residents why the residential area has changed (e.g. to provide opportunities for an active lifestyle) and why this would be beneficial to them (e.g. to gain health benefits from physical activity). Such understanding does not come automatically through changes in the design of the built environment. An additional educational component may increase the effectiveness of an intervention to create “physical-activity-friendly” neighbourhoods.

In some deprived residential areas, other social issues (e.g. nuisances, social problems, crime) rather than physical activity for health may be the initial reason for an environmental intervention. In such interventions, these issues need to be addressed before health education approaches can be considered.

Moreover, the effect of educational approaches will depend on the target group to be reached. Usually, children do not respond well to health-related educational approaches, as their main motive for playing and otherwise being active is fun rather than health. In contrast, middle-aged adults and older people respond better to health-related educational approaches, since health is important to them. The challenge is to take all residents’ interests into account with regard to the design of environments supporting physical activity.

Champions/key leaders (e.g. within the community, civil service or political sector) may act as catalysts and boost the initiation and implementation of an intervention.

Social cohesion, a sense of belonging and local knowledge of the community may facilitate the implementation of an intervention.

Opportunities for daily physical activity
Environmental interventions are likely to be successful when they focus on providing opportunities for physical activity that people can incorporate into their daily routine (e.g. a path system, green spaces, play facilities for children).

What are the challenges (barriers) faced during the implementation of interventions?

Limited time and resources
Interventions to create environments supporting physical activity, particularly those including intersectoral and participatory approaches, can take a long time. There may be distrust in the community towards the institutions involved in their implementation (e.g. owing to previous interventions proving unsuccessful). Also, residents are often not aware that local administrative approval processes may take a long time, and they may get frustrated with the implementation of an intervention in their neighbourhood.

Different needs of different stakeholders
It will not be possible to satisfy the needs and interests of all stakeholders involved in the design of residential areas that support physical activity. Those stakeholders who did not agree with certain changes in the residential environment may drop out of a project or oppose it.

Evaluation
With regard to evaluation, the following challenges were mentioned by participants.

- The effects of a local small-scale environmental intervention (e.g. increase in physical activity among commuters) are difficult to measure when the sample size is small.
- Multiple evaluations carried out by different partners involved in the intervention may lead to a high reporting burden among participants.
- The evaluation process can be delayed when constructions (playgrounds, cycle tracks, etc.) in the residential environment are delayed (e.g. due to funding issues).
- Potential changes in the population, residential mix or housing stock of the intervention area (e.g. new residents moving into the improved neighbourhood) may cause social problems (gentrification).
- Funding may not be contingent on evaluation, and therefore convincing stakeholders of the importance of ongoing evaluation can be difficult.

Key experiences

What are the key experiences (lessons learned) from carrying out interventions?
The following key experiences were mentioned by the participants.

- Interventions to create residential environments that support physical activity need to be evaluated in order to learn from failures and successes. Evaluation can be a factor for success if it provides immediate feedback on positive effects of the intervention. For example, process evaluation could provide project staff and partners with important information on the components of the intervention that were implemented effectively and those that require modification. Regular brief evaluations (feedback) during the intervention process (process evaluation) should be conducted to provide an opportunity to redirect the implementation process if necessary.
- It is difficult to foresee all details of implementation in advance. Sometimes, for example, interventions need to be adjusted to target groups and local circumstances. This has to be taken into account in planning and evaluation.

- Some interventions should also include an educational component (e.g. regarding the impact of the residential environment on physical activity or the health benefits of physical activity), particularly when the initial focus of the intervention was not on promoting physical activity and health.
- Key stakeholders (residents, project partners) in the community should be involved in the planning and implementation of an intervention, including children and adolescents. Existing social networks and social cohesion within a community, as well as educational or behavioural components (e.g. education of target groups about the benefits of physical activity on health) may increase the effectiveness of such participatory approaches.
- There needs to be an organization or person responsible for the implementation of the intervention.

Conclusions and recommendations

Pulling together all the finding from the project, the WHO ECEH, Bonn Office provides the following conclusions and recommendations.

All population groups
Several factors in the residential environment positively affect physical activity behaviour, active living and the risk of overweight and obesity in all population groups:

- perceived safety, including road safety and safety from or no fear of crime;
- aesthetically pleasing environments that are well-maintained and interesting to look at;
- short distances that enable people to get to and from places on foot or by bicycle, and to use public transport without spending too much time covering long distances; mixed land use, density and street connectivity facilitate short distances;
- accessibility to physical activity facilities; and
- active transport opportunities (walking, cycling) and access to public transport.

Children and adolescents
For physical activity among children and adolescents, important residential environment factors are:

- access to indoor and outdoor facilities for sports and play close to the home (e.g. parks, playgrounds, green spaces, sports clubs, sports facilities on school yards and kindergartens);
- perceiving the neighbourhood surroundings as interesting and friendly; and
- being able to safely walk or cycle to school and other destinations.

Older people
For physical activity among older people, important residential environment factors are:

- convenient, walkable distances from the home to public facilities (businesses, stores, shopping malls);
- an activity-friendly, pleasant neighbourhood with opportunities for safe walking for recreation and active transport (e.g. well-maintained pavements); and
- recreational facilities (parks, walking and cycle trails) in the vicinity of the dwelling.

The socially disadvantaged
For socially disadvantaged people and those living in deprived areas, it is particularly important to improve their limited access to facilities for physical activity (e.g. sports facilities) and to reduce their exposure to residential surroundings that are not supportive of physical activity (e.g. unpleasant, poorly-maintained parks, dwellings and pavements; and areas affected by crime and road traffic).

Intervention approaches
Several intervention approaches are suitable for creating residential environments that support physical activity, such as:

- creating footpaths and cycle trails;
- providing opportunities for active commuting, including public transport;
- providing access to physical activity facilities throughout the year (e.g. parks, open spaces, playgrounds, indoor and outdoor sports facilities);
- increasing the quality, aesthetic design and attractiveness of residential areas;
- connecting streets to facilitate short distances between destinations;
- providing mixed land use;
- reducing crime or fear of crime (e.g. by providing street lighting, pleasant neighbourhoods free of graffiti, litter and incivilities; and by introducing crime prevention measures); and
- improving road safety (e.g. through traffic calming measures, speed limits, well-maintained pavements and street lighting).

Implementation
There are three types of approach to implementing interventions:

- building new opportunities/facilities for physical activity in the residential environment;
- modifying or improving existing opportunities/facilities for physical activity in the residential environment; and
- making existing opportunities/facilities for physical activity in the residential environment accessible, particularly to specific population groups such as children and adolescents, the socially disadvantaged, migrants and people with various religious and cultural backgrounds.

Targeting
Interventions to create physical activity supportive residential environments should be targeted to the whole population as well as to specific population groups, such as children, older people and the socially disadvantaged. Physical activity opportunities in the neighbourhood often reach only those who are interested in physical activity, or who are already active. Particular emphasis should be placed on approaches that help reach the least active people. Possible approaches are to design the residential neighbourhood in a way that "gently forces" people to become physically active in daily life. The motto of such neighbourhood planning would be to "make the active choice the easier and more attractive choice". Such neighbourhood planning may also reach those people who are not stimulated by the concept of being active for health or physical fitness. Possible approaches to identifying such target groups are to:

- conduct population-based surveys (e.g. on housing and neighbourhood conditions, health, physical activity) in order to identify the least active groups; and
- assess the lifestyles of individuals within a defined geographical area.

Participatory approaches
Different resident groups (e.g. children, adolescents, adults, older people, disabled people, cultural groups), as well as key local community partners, need to be involved in the planning, implementation and evaluation of an intervention to ensure its success and sustainability.

Intersectoral collaboration
Intersectoral collaboration between governmental, nongovernmental and possibly private industry organizations from different sectors (e.g. health, urban planning, housing, transport) is needed in order to implement infrastructural changes in a residential area.

Political commitment
National as well as local-level political commitment from decision-makers and politicians is crucial for the successful implementation of interventions.

Funding
Long-term funding is needed after an intervention shows initial positive results, so that the intervention can be sustainable over a longer period of time and really have an impact.

Evaluation
Interventions to create environments that support physical activity need to be evaluated. Evaluation should be planned at the beginning of the project, and key stakeholders involved in the intervention should be brought together to plan the evaluation. About 10% of the total intervention budget should be spent on evaluation.

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Annex 1

STATISTICAL TABLES OF SECONDARY DATA ANALYSIS

Overview of variables used

Table A1.1: Overview of variables and cut points included in the secondary analysis

Health risk factors	
Physical activity	Self-reported leisure-time physical activity was measured by a single item: "Which statement do you think best describes your amount of sport or physical exercise?" 1. Responses of "I have never been doing sport/physical exercise" and "I used to do sport/physical exercise" were collapsed into a category of *"No current sport/physical exercise".* 2. Responses of "I frequently do sports/physical exercise at moderate level" "I frequently do sports/physical exercise at intense level" were collapsed into a category of *"Frequent sport/physical exercise".* 3. The response *"I occasional do sport/physical exercise"* remained its own category "Occasional sport/physical exercise".
Body mass index	Self-reported data on height and weight was used to calculate body mass index: weight (in kilograms) divided by squared height (in meters). The international WHO classification was used for overweight and obesity among adults (18-80 years): Overweight: BMI between 25 and 29.9 Obesity: BMI 30 and over For children and youth aged 2-17 years the BMI values were constructed according to international cut points proposed by Cole et al. 2000, which are based on a number of international studies collecting data on BMI and overweight for children and provide detailed information for BMI cut points by age and gender.
Confounding factors	
Age	Whole population: 2-80 years Specific age groups: Children and youth: 2-17 years Adults: 18-64 years Older adults: 65 years up to 80
Gender	Men Women
Marital status	Married, living with spouse Separated Single Divorced Widowed Living together with steady partner

Education	Level of education relates to individuals' the school leaving certificate. Response categories were collapsed into low, medium and high level education: Low: Primary/elementary Medium: Secondary first stage, Secondary second stage High: Post-secondary (university or similar)
Employment status	Full time work Part-time work Pupil/student Pensioner Unemployed / laid off Taking care of household or a family member Recruit or non-military service Other
Household income	Six household income groups ranging from lowest to highest income were collapsed into three categories of low, medium and high income: Low: Lowest income, Group 2 Medium: Group 3, Group 4 High: Group 5, Highest income
Problem for household to pay housing expenditure	Yes No
Environmental factors	
Type of neighbourhood	Panel blocks Mainly houses Mainly apartments blocks Mixed
Location of the surveyed housing	Urban Suburban Rural
Open or green space that belongs to building	Yes, private Yes, commonly shared No
Public park or green open space close to dwelling (up to 100m)	Yes No
Enough recreational areas in immediate housing environment – for children and youth	Responses of the questions -"Enough recreational areas in immediate housing environment - for children" -"Enough recreational areas in immediate housing environment - teenagers" were collapsed into "Enough recreational areas in immediate housing environment – for children and youth". Response categories were Yes To some extent Not really
Enough recreational areas in immediate housing environment – for elderly people	Yes To some extent Not really
Steps or staircase inside the dwelling	Yes No

Graffitis	No graffitis 1 or 2 3 to 5 6 or more
Amount of litter	1=Very dirty 2 3 4 5=not at all dirty
Dog droppings	1=Extreme amount 2 3 4 5= no dog droppings
Vegetation on public grounds	Yes No
Vegetation on private grounds/ gardens	Yes No
Vegetation on facades/ balconies/ windows	Yes No
Feel safe returning home when it is dark	Yes To some extent No

Bivariate analyses:

Table A1.2: Distribution of sports / physical exercise behaviour by age and gender

	Male					Female					All				
	2-17	18-64	65+	All		2-17	18-64	65+	All		2-17	18-64	65+	All	
	%	%	%	n	%	%	%	%	n	%	%	%	%	n	%
No current sports physical exercise	22,1	39,9	65,7	1561	40,4	20,9	41,6	72,9	1903	43,0	21,5	40,8	69,6	3470	41,8
Occasional sports physical exercise	22,9	34,1	18,8	1148	29,7	35,6	37,7	16,4	1501	33,9	29,2	36,0	17,6	2653	31,9
Frequent sports physical exercise	55,0	26,0	15,5	1156	29,9	43,5	20,8	10,7	1018	23,0	49,3	23,2	12,9	2181	26,3

Table A1.3: Distribution of body mass index by age and gender

	Male					Female					All				
	2-17	18-64	65+	All		2-17	18-64	65+	All		2-17	18-64	65+	All	
	%	%	%	n	%	%	%	%	n	%	%	%	%	n	%
No overweight	83,7	50,3	35,0	2079	54,6	85,7	65,5	39,9	2791	65,4	84,7	58,5	37,5	4873	60,3
Overweight	9,8	37,1	48,8	1275	33,5	9,7	23,4	41,8	1007	23,6	9,8	29,7	45,2	2286	28,3
Obese	6,5	12,6	16,2	454	11,9	4,6	11,1	18,3	469	11,0	5,6	11,8	17,3	923	11,4

Table A1.4: Distribution of sports / physical exercise behaviour by BMI

All	%	(N)	No current sports/ physical exercise	Occasional sports/ physical exercise	Frequent sports/ physical exercise
No overweight	60,2	4764	47,4	63,5	75,3
Overweight	28,3	2242	34,0	28,0	20,2
Obesity	11,5	910	18,6	8,5	4,5
Male	%	(N)	No current sports/ physical exercise	Occasional sports/ physical exercise	Frequent sports/ physical exercise
No overweight	54,5	2024	43,6	53,0	69,9
Overweight	33,5	1246	38,7	35,8	24,7
Obesity	12,0	446	17,7	11,2	5,4
Female	%	(N)	No current sports/ physical exercise	Occasional sports/ physical exercise	Frequent sports/ physical exercise
No overweight	65,3	2738	50,7	71,7	81,3
Overweight	23,7	992	30,0	21,9	15,2
Obesity	11,1	464	19,4	6,3	3,5
Children	%	(N)	No current sports/ physical exercise	Occasional sports/ physical exercise	Frequent sports/ physical exercise
No overweight	84,6	1152	76.1	85,5	87,1
Overweight	9,8	133	9,9	9,7	9.8
Obesity	5,6	76	14,0	4,8	3,2
Adults	%	(N)	No current sports/ physical exercise	Occasional sports/ physical exercise	Frequent sports/ physical exercise
No overweight	58,5	3211	47,9	61,8	72,1
Overweight	29,7	29,7	33,7	29,4	23,0
Obesity	11,8	11,8	18,3	8,9	4,9
Seniors	%	(N)	No current sports/ physical exercise	Occasional sports/ physical exercise	Frequent sports/ physical exercise
No overweight	37,5	401	36,0	35,3	47,7
Overweight	45,0	481	42,9	52,5	45,0
Obesity	17,4	186	21,0	12,3	7,3

Table A1.5: Distribution of sports / physical exercise in whole population (2-80 years of age) by income groups

	ALL				
	%	(N)	Low (%)	Medium (%)	High (%)
No current sport / physical exercise	41,6	3080	61,1	40,8	26,2
Occasional sports / physical exercise	32,0	2373	21,8	33,4	38,8
Frequent sports / physical exercise	26,4	1958	17,1	25,8	35,0

Table A1.6: Distribution of BMI in whole population (2-80 years of age) by income groups

	ALL				
	%	(N)	Low (%)	Medium (%)	High (%)
No overweight	60,1	4335	54,3	58,9	66,4
Overweight	28,3	2039	30,6	28,8	25,8
Obesity	11,6	835	15,1	12,3	7,8

Multivariate analysis:

Impact of the residential environment on physical exercise

Table A1.7: Regression on "sports / physical exercise"

Components / Factors	Model 1	
	b	t
Urban problems	-,004	-,3*
No recreational spaces	-,277	-24,1
Youth characteristics	,347	30,3
Material wealth	,274	23,8

*Not statistically significant (95%-level).

The relative explanatory power of the factors is given by parameter t. The higher the amount of t is, the more powerful is the factor. Negative values indicate a negative association (e.g.: the more problems with "no recreational spaces", the less sports/physical exercise) while positive values indicate a positive association (e.g. more "material wealth" is associated with more activity).

The b-value (beta value) also indicates the direction of the impact (positive or negative), but its impact on physical exercise can also be interpreted quantitatively. Taking "no recreational spaces" as example, the beta value of -0,277 means that – statistically speaking - with each decrease of spaces for physical activity, the physical exercise score decreases by -0,277. With physical exercise measured on a 5-point scale, this would in turn mean that residential areas with two more recreational opportunities compared to other areas would be associated with an increase of sports / physical exercise by 0,55, which represents half a point on the measuring scale. A high beta value therefore indicates that the respective factor or variable has a strong impact on the measured outcome, in this case physical exercise.

Impact of the residential environment on BMI

Table A1.8: Regression on "Body Mass Index (overweight / obesity) (02-80 years)"

Component / Factors	Model 1		Model 2	
	b	t	b	t
Urban problems	,066	1,4*	,070	1,4*
No recreational spaces	,239	4,9	,125	2,4
Youth characteristics	-2,774	-56,2	-2,569	-48,8
Material wealth	-,534	-10,9	-,387	-7,6
Sports/physical exercise			-,460	-9,6

*Not statistically significant (95%-level) and therefore not used for other models.

With a five-point scale for physical exercise, the data of table 13 suggests that for each "higher level" of exercise (e.g. frequent moderate exercise instead of occasional exercise), the BMI decreases by 0,46 BMI points.

Annex 2

SELECTED EUROPEAN CASE STUDIES

Moving Kids – Physical Activity Promotion in Designable Environments, Germany

Country: Germany

Timeframe of implementation: 2003 – 2005, plus ongoing initiatives

Population level

District level

Setting

The project took place in the residential area called Lüdersring/Lüttkampsanger in the district Lurup which is located in the city of Hamburg, north of Germany. Lurup has a population of about 31 979 inhabitants. Compared to the whole city of Hamburg, it is characterised as a district with a relatively high proportion of children. Moreover, Lüdersring/Lüttkampsanger is a residential area where relatively many socially disadvantaged population groups live.

Moving Kids was conducted in the kindergarten and school settings but also focused particularly on the residential environments surrounding these settings, as for example, public open spaces (playgrounds, parks). The aim was to identify and connect several existing physical activity supportive environments in the residential neighbourhood.

Target groups

Children 3-12 years of age who live in the residential neighbourhoods of Lurup

Objectives

The aim of 'Moving Kids' was to promote physical activity and health among children using an ecological approach. This means that physical activity is understood as a medium of dealing with the physical, social and cultural environment. Promotion of health means to strive for a balanced relationship between a child who is in need of personal development and the determinants in the environment.

Specific objectives of the intervention were to

- Provide spaces in the residential environments that support physical activity and playing among children. These should be places in which children leave marks, develop their imagination for playing and experience the environment as being designed and designable.
- Win persons and facilities responsible for children (i.e. kindergarten, parents, primary school) in favour of the project concept, to anchor the project concept in the daily work in these settings, and thereby making it sustainable.

- Organize a network for the 'Moving Kids' project including communal and private institutions in the district Lurup and the city of Hamburg.

Intervention

Moving Kids was implemented as part of Germany's national Action Programme Environment and Health (Aktionsprogramm Umwelt und Gesundheit/APUG) within which a series of local community interventions were financially supported around specific environment and health topics. Moving Kids was conducted under the topic 'Healthy living and residential environment' (German: „Gesundes Wohnen und Wohnumfeld').

The intervention comprised four modules all aiming to promote children's physical activity and health:

Module 1. The physical activity and action site:
So-called 'physical activity and action sites' were set up in kindergartens and schools using diverse materials for physical activity-oriented playing (e.g. boxes, shelves, bars and logs made of wood, old car tires, ropes, balls). The sites allowed children to construct out of these ready-made but open to use materials a scenery where they could play and be physically active. The sites were to inspire children's imagination in terms of active playing and promote their physical skills. Two kindergartens and four schools have received training on how to promote physical activity at the site. Meetings were held with the parents to introduce them to the concept of creating designable spaces such as those physical activity and action sites.

Module 2. Recapturing of urban spaces:
Children, educators, teachers and parents from two kindergartens and one school jointly went on several exploration tours in the residential neighbourhood in order to rediscover their residential environment and reinterpret it as spaces for playing. All participants noticed that with imagination spaces for playing could be rediscovered and recreated.

Module 3. Create space through experience:
'Create space through experience' was the motto of an activity with clay. The goal was to artistically design the environment. During August and September 2004 children and adults could build figures and sculptures out of clay on a site in their residential neighbourhood. These figures were up to three meters high. After a big party the sculptures were accessible for about a week. The children could play with them and climb on them. In the mornings children from four kindergartens and two schools could develop their artistic and physical skills intensively on the clay site.

Module 4. Outdoor territories for physical activity
Construction plans for the redesign of a playground of the SAGA (a residential building agency based in Hamburg), as well as a close-by park area to be used by a kindergarten were developed in collaboration with the users (i.e. local residents, particularly children). Remarkable was the concept of how to make the close-by park accessible for a kindergarten. It was jointly developed by children, educators and a landscape architect.

All four modules were closely connected and based on each other. The most sustainable effect was gained in the two facilities that engaged in all four modules.

Political commitment

The local community intervention „Moving Kids – Physical activity promotion in designable environments' was implemented as part of Germany's national Action Programme Environment and Health (German: 'Aktionsprogramm Umwelt und Gesundheit' /APUG) which was jointly initiated in 1999 by the Federal Ministry of Health; the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety; and the Federal Ministry of Food, Agriculture and Consumer Protection. As part of this nationwide Action Programme a series of local community interventions were supported around specific environment and health topics. Moving Kids was supported under the topic 'Healthy living and residential environment' (German: „Gesundes Wohnen und Wohnumfeld').

Moreover, the Hamburg city authority for science and health (German name: Behörde für Wissenschaft und Gesundheit Hamburg) was involved the Moving Kids project as the concept of Moving Kids was also linked to the broader 'Healthy, Social City Hamburg' Programme (German name: 'Gesunde, Soziale Stadt Hamburg') which is implemented in three districts of Hamburg including the district Lurup. For example, the Moving Kids project was introduced in a short movie on the Healthy, Social Cities Programme.

Besides that, a local building authority for landscaping and gardening (German: Gartenbauamt) provided commitment and cooperation with regards to the construction and design of public spaces (parks).

Funding

Moving Kids was mainly funded through the national Action Programme Environment and Health. Some additional project funding came from an accident insurance company based in Hamburg (Landesunfallkasse Hamburg). Moreover, the costs for the reconstruction of an outdoor territory nearby a kindergarten was jointly covered by the city of Hamburg and the kindergarten itself through donations.

After completion of the Moving Kids project ProQuartier, a sub-organization of the residential building society 'SAGA' (Tochterfirma der SAGA, ProQuartier), provided some funding for ongoing initiatives in the district Lurup, such as for the development of an adventure playground (show-jumping course).

Stakeholders

The local institution 'Hamburger Forum Spielräume' was the leading agency for implementing the Moving Kids project. The Hamburger Forum Spielräume is based at a research centre in the area of physical activity promotion (German name: Institut für Urbane Bewegungskulturen e.V.) at University of Hamburg, Department of Exercise Science (German name: Fachbereich Bewegungswissenschaften).

In addition, many other local institutions and professionals within the governmental, non-governmental and private sectors were involved in the implementation of Moving Kids. These include kindergartens, schools, local authorities, a residential building society, health promotion and sporting associations, a landscape architect, etc. Some of the institutions are listed in the following:

- Kindergarten in Lurup, Hamburg (i.e. Kita Boberstrrasse, Kindergarten Morgenröte, Kita Sommerweg, Kita Moorwisch)
- Schools in Lurup, Hamburg (i.e. Schule Langbargheide, Schule Luruper Hauptstraße, Schule Swattenweg, Fritjoff Nannsen Schule)
- District project coordinator
- Editor of the district newspaper 'Lurup im Blick'
- Luruper Forum including representatives based at local institutions
- A shop in the district Lurup (Stadtteilladen STEG = Stadtentwicklungsgesellschaft)
- The residential building society 'SAGA' (soziale Wohnungsbaugenossenschaft SAGA)
- ProQuartier, a sub-organization of SAGA (Tochterfirma der SAGA, ProQuartier)
- Staff of a local family services organization (Mitarbeiter von der Familienservicestation)
- A Hamburg authority for science and health (Behörde für Wissenschaft und Gesundheit Hamburg)
- Hamburg Association for Health Promotion (HAG (Hamburgische Arbeitsgemeinschaft für Gesundheitsförderung e.V.)
- An accident insurance company based in Hamburg (Landesunfallkasse Hamburg/LUK)
- A sporting association (Verband für Turnen und Freizeit/VTF)
- A local building authority for landscaping and gardening (German: Gartenbauamt)

Evaluation

An evaluation team/working group including key stakeholders involved in the implementation of Moving Kids was set up to carry out process evaluation including formative evaluation. It was carried out in form of a self-evaluation (e.g. through observation, interviews) with the aim to make the whole project process transparent. Results of the process evaluation were regularly reported back to the project coordinators in order to check whether milestones set in the project planning were actually achieved.

Findings from the process evaluation to-date are:

Module 1: Children who were playing on the physical activity and action sites were concentrated and and even-tempered. Their physical activity skills could be increased and they gained more confidence in their own physical activity skills.

Module 2: Through the exploration tours in the residential neighbourhood children rediscovered in their residential environment as an area suitable for physical activities. New ideas for playing were developed and practiced. The children realized that with only little imagination and materials they could use their residential environment as an area for playing and being active

Module 3: During the construction and design of the 'clay site' (a site with sculptures made of clay) even previously disturbing children showed more patience and concentration. Their fine motor skills as well as their creative skills could be enhanced, particularly among those children who regularly visited the clay site.

Success factors and challenges

Key factors supporting successful implementation of the Moving Kids project:

- The close collaboration among the project team members was noticed very positively by local project partners in the district Lurup, as well as by the public. The collective work also led to further development and improvement of the four intervention modules.
- The implementation of Moving Kids was facilitated through already existing local networks and project activities in the district of Lurup. This infrastructure could be used for the implementation of Moving Kids. Furthermore, the concept 'physical activity promotion in designable residential environments' including the four intervention modules (physical activity and action sites, recapturing of urban spaces, create space through experience, outdoor territories for physical activity) was well received and adopted in other local project activities.
- A review of the infrastructures in the district Lurup as part of the project planning.

Some challenges faced during the implementation of the project:

- Reaching the parents, raising their awareness on the importance of physical activity and getting them engaged in physical activity promotion activities was sometimes challenging.
- There were concerns among some kindergarten staff regarding children's safety when they participated in physical activities (e.g. risk of accidents) and staff's responsibility for the children's safety. The result was that some staff hesitated to participate in further professional training in physical activity promotion.
- Networking among the several kindergartens involved in the implementation should have been fostered even more.

Key experiences

- Good collaboration between representatives of the respective organizations and institutions involved in the project must be developed and cultivated. This requires personal contacts and regular meetings so that project partners regularly become aware of and reflect the project aims and progress. This is time consuming and requires patience and flexibility by project coordinators, and this is usually not sufficiently considered in the project budget.

- Joint and coordinated action of the project team shows that all single project modules are thematically integrated and that the whole project is perceived as consistent concept.

- Involving local residents in the planning and construction activities is very important in order to achieve identification with and a sense of responsibility for the designed spaces.

- There were some synergies through the collaboration with already other existing local project initiatives in the district. The Moving Kids project modules could add to these existing initiatives and so the Moving Kids was seen as a complementing not a competing project.

- Health promotion for children also means involving the parents in health promotion activities so that these take effect beyond the kindergarten and school settings. For the Moving Kids project this meant that physical activity must also be facilitated and promoted in the home

setting (i.e. dwelling place, front door). This requires rethinking towards creating more physical activity friendly environments (at home, in the neighbourhood), not only by parents but also by neighbours, landlords and dog owners. In order to initiate such rethinking that allows children to enjoy physical activities in the immediate housing environment several events and informational meetings with parents/families were initiated as part of the project.

Sustainability of the intervention

The sustainable effect of Moving Kids can be proofed

- through subsequent projects in the district Lurup, i. e. the set up of a show jumping course and further creations of spaces for physical activity.
- through the documentation and lectures in which the concept of 'Moving Kids' has been carried on.
- by having done first steps to transfer the project into other districts. Planning for this has already started.

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Movement as Investment for Health, Germany

Country: Germany

Timeframe of implementation: 2005-2007

Population level

The Movement as Investment for Health intervention takes place at the local level (City of Erlangen, Germany).

Setting

Erlangen has about 100 000 inhabitants and is one of the more affluent cities in the state of Bavaria, Germany. However, within the inner city and some suburbs, residential areas that can be described as being disadvantaged do exist. The intervention takes place in a residential area (neighbourhood) in the inner city that features comparably high rates of unemployed individuals, social welfare recipients and migrants (predominantly from Turkey). This area was selected for the intervention due to these characteristics.

From a perspective of urban planning, this residential area is, although it is lying in the inner parts of the city, secluded from other parts of the city by some mayor traffic lines.

Target groups

Physical activity promotion measures are targeted to middle-aged females (30-60 years of age). A special focus is placed on women who are in "difficult life situations". The terminology "difficult life situations" was agreed upon with the target group. Being a single-mom, being unemployed, living from social welfare, or being a migrant from a country outside the European Union are all characteristics that can contribute to being in a difficult life situation.

National health survey data from 1997 showed that prevalence of sedentary lifestyles is particularly high among these population subgroups.

Objectives

The Movement as Investment for Health intervention aims to promote physical activity among the target group by utilizing a newly designed approach focusing on (health) assets for health promotion. The overall goal of the intervention is to empower the target group to take control over their physical activity and the factors that are influencing it. Objectives are related to the development of individual competencies and the development of supportive physical, social and political environments for physical activity.

Intervention

The project used a participatory and intersectoral approach to plan and implement interventions for the promotion of physical activity among the target group. Women from the target group were engaged in a process of cooperative planning, together with stakeholders in the settings, in order to plan interventions in their neighbourhood. Key intervention measures planned and implemented to-date are:

- Organising new exercise classes for women of the target group. These classes are of low-cost and feature child-care.
- Opening the residential elementary school to host exercise classes. The elementary school features a gym that was predominantly used by sports clubs. Women of the target group voiced their interest in using the gym for exercise classes, since it is conveniently located in the neighbourhood.
- Opening the residential indoor pool to host "women only" hours that provide especially Muslim women the opportunity to swim. The city of Erlangen features two indoor-pools that did previously not feature women-only hours. Women of the target group voiced strong interest in such women-only hours. After negotiations with the operator of the local indoor-pools, one of the indoor-pools opens on Sunday afternoon for women only.
- Educating women of the target group to become exercise-instructors. Women of the target group were interested to acquire a license of the German Olympic Sports Association to work as an exercise-instructor. Organizational changes in the education program (e.g. child-care, women only) have to be made to enable the target group to join the classes.
- Creating an outreach office in the neighbourhood for physical activity promotion among women of the target group. Tasks of the office are to promote exercise classes in the neighbourhood, to organize classes (hiring instructors, renting facilities), and to negotiate issues of physical activity promotion with city-officials. The office is run by one of the women of the target group who took part in the cooperative planning process.

Political commitment

Officials of the City of Erlangen joined the application for funding and committed themselves to support the project. Within the cooperative planning process, city-officials (e.g. mayor, members of the city council, member of city-office for social and cultural affairs, member of the administrative office for facility management) were engaged in the planning and implementation of intervention measures.

Moreover, an investigation of existing policy options at national, state, and local level was undertaken as part of the project. Results of the policy analysis demonstrated some policy options being partly related to tasks of the intervention but no policy is fully adequate to it.

Funding

The scientific work of the project (e.g. project development and evaluation) is funded by the Federal Ministry of Research. Funding for the intervention itself had to come from different sources. Funds for implementing the intervention measures were acquired from a local foundation, a program of the German Sports Association supported by the German Ministry of Inner Affairs, and a grant from the Ministry of Social Affairs of Bavaria.

Stakeholders

Several institutions at the local level support the work on the Movement as Investment for Health intervention and have been engaged in the planning process:

- City offices for social affaires and sports, administration for facility management
- Representatives of local religious communities
- Representatives of sport clubs
- Representatives of Kindergartens, child care organizations
- Local Folk University
- Representatives of political parties

These partners supported the project by their means. For example, the city office for social and cultural affairs provided an office room for the new neighbourhood office for physical activity promotion. Public facility management supported that exercise classes for women of the target group could take place in the elementary school. One member of the city council lobbied, that women only indoor-pool hours could take place. The Folk University is currently adopting the exercise classes as part of their class schedule.

Since the intervention measures were part of a research project, the Institute of Sport Science based at the University Erlangen-Nuremberg is the leading and responsible agency for project development and coordination. The implementation was jointly led by the Institute and the co-operating partners mentioned above. In order to sustain intervention measures, processes are under way to give involved partners full responsibility for the interventions measures in the future.

The key driving forces involved in the intervention are therefore the scientific project team (Institute of Sports Science/ University Erlangen-Nuremberg), women of the target group and some policymakers and stakeholders who joined the cooperative planning process.

Evaluation

One of the key objectives of the project was to develop an integrated evaluation design for the intervention measures. Scientific partners of the evaluation are the Institute of Sports Science/University Erlangen-Nuremberg as the project coordinator, the Institute of Sports Medicine/University Frankfurt, health economists from a Federal Research Institution in Munich, and the WHO Office for Investment for Health and Development (Venice).

To-date, participation rates among women involved in the interventions measures have been tracked. A pre-post study design was used to assess physiological (e.g. heart-rate-variability, blood-test), and health behaviour (e.g. physical activity, nutrition) parameters of women participating in the exercise classes. Based on an analysis of quality of life and costs of medical treatment a health economical analysis has been performed. Moreover, social impacts at the individual, family and neighbourhood level will be analysed using qualitative interviews, focus group discussions, and family conferences. Through qualitative interviews with stakeholders, impacts on policy and organizational capacities for health promotion will also be assessed.

The evaluation is still in progress. Preliminary results indicate that women of the target group adopt interventions readily. Women who participated in exercise classes increased physical activity, and showed improved performance on some of the physiological indicators. Effects on health show small but mostly insignificant effects on costs for medical treatment. Social and political impact evaluation will be performed in the next six months.

Success factors and challenges

Key factors supporting successful implementation of the intervention:

- Most crucial was the initiation of support from the target group for the project work. For example, some women from the target group acted as a “social catalyst” for other people in the group to participate in project activities. In addition, informal social networks among women of the target group were important to involve an increasing number of women to engage in project activities.
- Some highly committed policy makers were very helpful during the implementation process. For example, policy makers used their positions and influence on political and administrative institutions and processes to facilitate access of the target group to different sport facilities.

- An academia-driven approach of participatory and intersectoral planning and implementation turned out to be an appropriate tool for involving different kind of stakeholders and it supported the successful implementation of the Movement as Investment for Health project.

Challenges faced during the implementation of the intervention:

- In the beginning, some stakeholders in the community doubted the process of cooperative planning. Used to more "efficient" processes of planning and implementing actions, engaging with the target group and "taking time" to jointly develop actions was thus seen as being cumbersome and time consuming.

- The Movement as Investment for Health project paid women of the target group for participating in the cooperative planning process and made them co-workers. Some stakeholders voiced strong concerns that paying the target group would not be an appropriate means and that the overall success of the project was due to these monetary incentives.

- Compared to initiating actions, sustainability of actions is the greater challenge. Sustainability of actions requires structural changes in the organizations taking part in the actions. For example, having a permanent outreach office for physical activity promotion in the neighbourhood would require approval from the city-council and would require shifting of existing funds or acquisition of additional funds.

Key experiences

- Engage the target group
- Engage the local community and stakeholders
- Use assets approach as a framework
- Social catalysts for participation

Transferability of the intervention

Key features of the intervention that would be transferable to other countries include the utilization of the health-assets/social catalysts concept and the participatory approach to engage the target group. Also, certain aspects of the evaluation (multidimensional design, use of quantitative and qualitative research methods) might be applicable to other interventions.

Sustainability of the intervention

One of the focal points of the project is sustainability. In the future, exercise classes will be organized by the local folk university. The indoor-pool operator has signalised interest to sustain the women only-hours. Mechanisms to sustain the city-office for physical activity promotion include a workshop on sustainability with women, stakeholders from the settings, policy makers and experts.

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Trekroner – A New Residential District Designed for Physical Activity, Denmark

Country: Denmark

Timeframe of implementation: 1999 – about 2020

Population level

District level

Setting

The intervention is implemented in a new urban district called Trekroner which includes about 3 000 dwellings with about 6 000 inhabitants. Trekroner is part of the city of Roskilde which has a population of about 50 000 inhabitants. The residential district is situated at the Eastern fringe of Roskilde and adjacent to the university. It is developed in a former agricultural area with centrally situated farms that are (to be) re-developed for children institutions.

The mostly one to three storey developments in Trekroner have mixed forms of ownership: private (single family and row/cluster houses), private housing associations, co-operations, social family (few due to low interest rates for housing loans) and social student accommodation.

Target groups

The residents of Trekroner including mostly

- Families
- University employees and students
- Elderly people living in a hospice and a housing development

Objectives

Key objectives were to

- Build an urban district where built and natural infrastructures are integrated, and that provides a high architectural standard with optimal spaces for residents' everyday life, e.g. for social interaction and participation in physical activity for all age groups (for recreation and transportation).

Intervention

The design of the residential district of Trekroner includes several components:

- A wide net of walking cycling pathways are built to provide easy and safe access to schools, institutions, train station and city centre, and thereby promote active transport. The path system already starts by the front doors, and ranges from lit and paved transportation paths to simple landscape trails. Safety for pedestrians, cyclists as well as access for disabled people has been a high priority. Moreover, a frequent bus service is available in order to diminish car travels. Also, paved paths are planned to be used for a coherent roller skating net.
- The district is subdivided by 40 meter wide forest belts as well as more open green belts that supplement the limited interior (mainly) lawns of the developments. Thus residents live only about 50 to 100 meters away from high quality green space. Facilities for play and other

outdoor physical activities for all age groups will successively be constructed in these green belts in cooperation with the residents of the district. The forest belts are placed East- West of Trekroner in order to create wind shelter. Wind shelter and lengths of outdoor stays are known to be correlated.

- Sustainability was an important concern in the design of Trekroner. The sustainability issue has supported local surface water management that is integrated with recreational opportunities: ditches, ponds and retention basins within the developments and restored lakes, ponds and rivers in the green areas.

Political commitment

The plan for the design of Trekroner was adopted by the municipal board as part of the urban development plan.

Funding

Large municipal funds are designated to build both paths and facilities for outdoor physical activities. Additional funding for activities may be provided by a semi-public organization interested in the concept.

For some parts of the district the overall land owner association will be responsible for running and maintaining the activity facilities.

Stakeholders

The paths are handled in accordance with normal municipal practice, where most parts are built and maintained as public paths. Some secondary paths are built and maintained by private developers based on requirements in the politically adopted local plans for parts of the district.

The Technical and the Cultural Departments of the Municipality of Roskilde will manage the Activity Plan for the design of Trekroner including the resident involvement. The residents are to participate in decisions on which facilities are wanted in the area. An illustrated catalogue of

inspiration is being prepared for the local residents and future land owners. Local "ownership" is pursued by leaving the maintenance responsibility for the facilities to land owner associations.

Evaluation

The district Trekroner is still under construction. The path system of the Western part of the district has received a national prize for lay-out to support use of bicycle, safety etc.

Success factors and challenges

Key factors supporting successful design of Trekroner:

- Political adoption of a local plan for the area and sufficient funding
- Enthusiasm of partners in the public administration

Challenges faced during the design of Trekroner:

- Site plans of the residential developments that do not take shade problems into consideration: A few places residents cut back trees to maintain view or direct sunlight.

Key experiences

- Paths are much used but must be ready for the first residents to use for safe transport in the ongoing construction process.
- Good paths make more children to cycle to school and club activities thus increasing their daily physical activity.
- Lighting of the main paths system is important for feeling safe at nightfall and so for the use of paths.
- Circular walking paths are popular: You may go for a short or long walk without backtracking.
- Walking paths in areas grazed by sheep or cows make it more interesting to walk and thus increase physical activity participation in the area.
- Even young wooded areas are much used for play.
- Woodlands must be planted as early as possible and preferably some years ahead of building activity in order to create an optimal play environment.

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Kerava Neighbourhood Sports Facility Project, Finland

Country: Finland

Timeframe of implementation: 2003-2006 (evaluation to be completed in 2007)

Population level

Municipal level

Setting

Target community: The City of Kerava, 30 km north of Helsinki, 30 000 inhabitants.

Target groups

Children and adolescents (main targets), parents and teachers (secondary targets).

Objectives

The overall goal of the Kerava Neighbourhood Sports Facility Project (KERNES) was to promote non-competitive physical activity during recesses and after school, in particular for children in primary school. Specific objectives were to

- Build a network of six neighbourhood (local) sports facilities to Kerava, during years 2003-2006.
- Increase physical activity of children.
- Improve health-promotion networking among different municipal sectors (sports, education, health, urban planning) and among the community, sports organizations and business.
- Study the process and the effects of the project on physical activity among low-grade pupils (9 and 12 years of age).

The project planned for a network of neighborhood sports facilities across an entire municipality. Principals of collaborative and interactive planning by different partners (pupils, parents, teachers, civil servants of the local community, researchers) of are applied. The project also aimed to study the process collaborative planning of neighbourhood sports facilities, how corporate funding can be used in addition to municipal and government funding, and to study the results and effects of neighbourhood sports facility construction.

Intervention

Six neighbourhood sports facilities were built around Kerava between the years 2003 and 2006. They were mostly designed on school yards and other locations not requiring significant excavation. A neighbourhood sports facility was defined as a "sports facility placed in a residential area or in its immediate vicinity that is intended for general and healthy exercise for children and adolescents." Each facility was planned by a collaborative team (10-20 members), consisting of pupils of the school, parents, teachers, civil servants of Kerava city and members from the research team). An interactive internet virtual space (OPTIMA) was used fro the planning work. The school yard is presented with photos and the team discusses the development of different parts of the yard in the internet.

Examples of activities to undertake at the neighbourhood sports facilities are:

- Skateboarding (in 1-2 facilities)
- Multiple ball games
- Climbing
- Balance
- Swinging etc.

Political commitment

The city of Kerava had initially decided to build one neighbourhood sports facility. In its essence, this was a political commitment and so was the decision to continue the project as suggested by the research team. The idea of expanding the project from one to six neighbourhood sports facilities was first introduced to the mayor of the city, who then (after a positive reaction) introduced this to the city council.

There is also a national (and political) commitment for building neighbourhood sports facilities. Local communities can apply for support from the province council. This support is received from the Ministry of Education, the ministry responsible for sports and physical education in Finland. The local community must invest at least 50% of the costs, but will receive (if the application is successful) usually 20-50% of the total costs from the province council.

This support scheme is also indirectly mentioned in the Government resolution on policies to develop health-enhancing physical activity (Ministry of Social Affairs and Health, 2002).

Funding

The Kerava Neighbourhood Sports Facility Project is funded by Kerava city, the national Ministry of Education and private sector companies (mainly Mc Donald's).

Stakeholders

The project is carried out by the UKK Institute and the University of Jyväskylä's Department of Sport Sciences (these two parties are also in charge of the evaluation and reporting).

The City of Kerava is the leading agency for implementing the intervention. The UKK Institute for Health Promotion Research has been the leading agency for research and the driving force for implementing the project. Mikael Fogelholm (director of the UKK Institute) was also the initiator for the whole project and the chair of the project team.

Other project partners are Sport Department of the City and the City Technology Office of Kerava city, as well as The Young Finland Association. The National Federation of Youth Sports (Young Finland) has been involved in the project team from the beginning as an expert consultant.

The main private sector, financial supporter is McDonalds Finland.

Financial support is also received from the Ministry of Education and the Regional Sports Council in the Southern Finland Province.

The project was implemented according to the principals of collaborative planning. A planning team was set up including schoolteachers and students, students' parents, and representatives from the city of Kerava (sports and urban planning sector).

Evaluation

The Kerava Neighbourhood Sports Facility Project is evaluated according to the CIPP (Context, Input, Process, Product) evaluation model (Stufflebeam 1983, Suomi 1998).

Using the model as a framework, the study evaluates the background (the external conditions for the project's fulfilment), the project's investments (amount of resources and their use), the process (the content of the activity and the mechanisms of influence).

Evaluation of context, inputs and process:
Interviews, evaluation of material and media coverage. The evaluation covers the whole process (background and needs of the project, planning, constructing, networking, sponsorship, etc.).

Evaluation of product, i.e., effects on physical activity:
Achievements (changes in the physical activity level of children, use of neighbourhood sports facilities, social activation).

The evaluation involves the following parts:

a) Quantitative evaluation of physical activity, obesity, use of sports facilities etc. A representative sample of 3. and 6. grade pupils (9 and 12-y old), total n=500. This part was carried out in fall 2003 and it will be repeated in fall 2006.

b) Evaluation of physical activity during recess in two schools before (May) and after building the facility (September and May) next year. This is done by using quantitative questionnaires and (in one of the schools) also observation by videotaping.
c) Qualitative evaluation of the process by using interviews, media coverage etc. This part will be completed between August and October 2006.

The evaluation is still in progress. The preliminary findings of part b) showed that (in one school) building the new facilities changed the pattern of physical activity during recess, but did not change the total amount of physical activity.

Success factors and challenges

Key factors leading to the successful implementation of the Kerava Neighbourhood Sports Facility Project:

- Political and practical commitment of the city of Kerava.
- Good cooperation between the partners.
- Adequate support from the private sector.
- Enthusiasm shown by the researchers.

Challenges faced during the implementation of the project:

- With more money, even better places could have been built. In two schools, the space allocated for car parking prevented or disturbed the planning of the sports facility.

Key experiences

- The successful implementation shows that when several partners have a joint objective, things start to happen. Both the city of Kerava and the main sponsor (McDonald's) saw this project as a possibility to gain positive visibility.
- The combination of practical processes and research worked very well. The principal investigators (Dr. Fogelholm and prof. Suomi) are well known in Finland, and this may have been one key factor explaining the commitment of both the City of Kerava and McDonald's.
- One key issue could be the optimal size of the implementation setting. Kerava was big enough to be an interesting area from a national view-point (e.g. a city with 3000 inhabitants would probably have been too small), but Kerava was also not too big for this project (e.g. neighbour-city Vantaa has 200 000 inhabitants, and covering even a part of Vantaa with neighbourhood sports facilities would be extremely costly).
- An interesting "spin off" has been the "neighbourhood sports facility van". This is an innovation from the sports sector of Kerava city. The van has equipment for ball games and other sports. During the period from early May to late September, the van visits one sports facility each day (from 18:00 to 20:00). By doing this, the possibilities of the sports facilities outside school hours can be increased (a photo of the van can be found at: http://www.kerava.fi/lahiliikuntaprojekti.asp).
- Another "spin off" is that an exercise instructor from Kerava city visits kindergartens according to a weekly schedule. Children from the kindergarten are then taken to the closest neighbourhood sports facility for a play session, supervised by the instructor. This possibility to play outside the kindergarten has bee very popular among small children.

Transferability of the intervention

The whole intervention could be transferred.

Sustainability of the intervention

It is clear that after the first excitement is gone, the use of the neighbourhood sports facility will fall. However, by improving the facilities for physical activity during recess, it is hard to see why a sustainable increase in physical activity could not take place. One key issue may be the behaviour of the teachers: if teachers – even in the future – encourage children to be physically activity during the recess, the results are likely to be better and more sustainable.

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The Dings Home Zone and Cycle-walkway, United Kingdom

Country: United Kingdom - England

Timeframe of implementation: 2002-2006

Population level

The Dings Home and Cycle-walkway intervention was implemented at local level.

Setting

A single, confined urban neighbourhood: 'The Dings' is situated in inner-city Bristol (city population ca. 400 000). The community is in the most deprived ward* in the city and in the bottom 10% of most deprived wards in England (according to 2005 figures). It consists of seven streets, approximately 120 households and 12 small businesses, surrounded by light industry and brownfield land. The neighbourhood had suffered from minimal local development in the preceding 40 years and was characterised by problems of severe commuter parking and traffic short-cuts, and long-term decline of the fabric of the residential streets.

*local authority administrative area

Target groups

- Adult and child residents (especially those living in the re-designed streets)
- Local schoolchildren
- Visitors to the area (including active and passive commuters)

Objectives

(1) Two main Home Zone project aims were agreed with the community:

- To redesign the streets to make the Dings a better place to live, with less dominance of vehicles
- To strengthen the community

The project delivery partners (Bristol City Council and Sustrans) and the major funding institution (EU-CIVITAS) also had objectives of sustainability, urban regeneration and the promotion of physical activity. They aimed to address all of these by making it easier for the residents to use their streets for walking and cycling, and also by encouraging commuters to park further away from their destination and walk.

(2) Simultaneously, the aim was to build an extension to the Bristol-Bath cycle-walkway (part of the UK's National Cycle Network, route 4). The 275 metre stretch will eventually connect through to the vicinity of Bristol's central railway station, with its surrounding areas of office building and new housing.

Intervention

(1) The Dings Home Zone is an urban community-based, environmental intervention. Engineering measures were coupled with an extensive community consultation process, intended to influence behaviour and promote social cohesion. The Home Zone comprises a street system re-designed primarily to meet the needs of pedestrians and cyclists and that opens up the outside space for social use and play. Specific actions undertaken in the area included:

- Creating a shared surface (block paving) to eliminate traditional distinction between pedestrian and car space, encouraging interaction between all users to bring vehicles speeds down to walking pace

- Breaking up long sight lines using design features (e.g. different parking arrangements, chicanes, planters and trees in the streets), to create a setting where it is natural to drive at significantly lower speeds

- Providing clear gateways to the home zone, to indicate to drivers that they are entering a different residential environment

- Using attractive materials for road surface and incorporating trees and other planting

- Removing unsightly overhead power cables and installing innovative street-lighting solutions

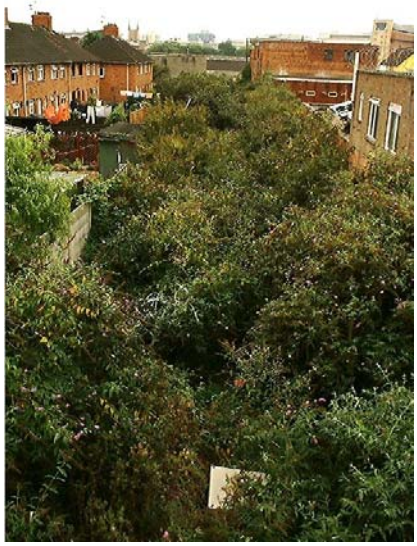
- Incorporating a community Arts Programme – employing artists and a writer to develop substantial creative and artistic content with residents to be included into the streets

- Using a Sustainable Urban Drainage System ("SUDS") to simplify the drainage system on the shared surfaces and eliminate unnecessary "clutter"

(2) Sustrans worked with Bristol City Council to ensure that the project also included the construction of a cycle-walkway through the neighbourhood to further the promotion of sustainable travel options to the local residents.

Bristol City Council included the Dings home zone in its successful VIVALDI project bid to the EU CIVITAS programme[3]. The project team began work on the design in April 2002.

[3] VIVALDI: A four-year project involving five European cities undertaking similar, innovative and integrated transport projects. CIVITAS stands for City-VITAlity-Sustainability. VIVALDI stands for VIsionary and Vibrant Actions through Local transport Demonstration Initiatives.

BEFORE	**AFTER**
Disused and overgrown railway bed: 	Cycle-walkway (extension to the Bristol-Bath section of the National Cycle Network): 
One of the seven residential streets: 	The same residential street: 
Another of the seven residential streets: 	The same residential street: 

Political commitment

The Dings Home and Cycle-walkway intervention was principally a local government initiative, with support from local parliamentarians. Local city councillors (representing two different political parties) were members of the steering group.

The home zone was part of the VIVALDI project in Bristol. Supported by EU-CIVITAS, VIVALDI is a €40million project which ran from 2002 to 2006. It involved the implementation of innovative transport measures to encourage sustainable transport in five European cities: Bristol, Bremen, Nantes, Aalborg and Kaunas.

Funding

Funding came through the VIVALDI project, including significant funding from Bristol City Council's own transport budget. A large grant towards capital costs was provided by Community @ Heart, Bristol's "New Deal for Communities" regeneration organization. Part-funding for construction of one of the streets was provided by Barratt Developments Plc, a private housing developer. Support for the Community Art Programme came from the Arts Council.

The British Heart Foundation provided a separate research grant to the University of Bristol, Department of Exercise, Nutrition and Health Sciences to carry out an evaluation of the environmental changes on levels of physical activity, well-being and self-perceived health.

Stakeholders

A steering group was set up for project implementation including:

- Bristol City Council (local authority - representatives from at least 20 different departments)
- Sustrans (UK national sustainable transport charity)
- The Dings Community Association Ltd (the residents association for the neighbourhood)
- Barratt Developments Plc (private sector home-builder, developing a neighbouring brownfield site)
- Chair of Governors for the local primary school
- University of Bristol-based research team
- 9 public utility providers
- 3 emergency services (including Avon Fire Brigade and Architectural Liaison Officer from regional police force)
- Nearby businesses
- Three artists and a writer
- Local city councillors
- Various community groups such as 'Playbus,' a local disability equality forum
- Other contractors/suppliers

Bristol City Council, Sustrans and the The Dings Community Association Ltd were the leading agencies responsible for implementing the project. The University of Bristol, Department of Exercise, Nutrition and Health Sciences (funded by The British Heart Foundation) was responsible for the evaluation of the project.

The driving forces of the project were:

- Bristol City Council: They had key roles from both the 'Transport Initiatives' team and engineering consultancy. They secured funding, managed the project and budgets, liaised between stakeholders, designed/appointed construction contracts and supervised site works.
- Sustrans: They secured funding, provided sustainable transport planning and community involvement expertise, managed the art project elements and played a pivotal role as an 'independent 3rd party' between local residents and the council.
- Dings residents: They participated in each stage of decision-making process through The Dings Community Association Ltd, appointed street representatives and during events, surveys and meetings.

Evaluation

The research team based at University of Bristol's Department of Exercise, Nutrition and Health Sciences has been evaluating the impact of the The Dings Home Zone and Cycle-walkway in terms of lifestyle changes, perceived health and well-being and levels of physical activity in adult residents and local primary school children. A mixed-methods, 3-year (longitudinal) study has been conducted, with data collection schedules continually adjusted to accommodate progress with the build of the cycle-walkway and home zone. Moreover, there was a focus on case study method development and experiences around partnership-working. The table below shows a record of the methods used to collect data that will lead to both process and outcome evaluations.

Data collection record

Data collection record		
	Date	Participants
Residents' survey		
Baseline	Dec 2003	72
Follow-up	Feb 2006	80
Focus groups		
Adult residents	Mar 2004	10
	Mar 2005	4
	Sep 2005	10
	April 2006	7
	May 2006	5
Primary school children	May 2004	9 (Yr5)
	July 2005	7 (Dings only)
	July 2006	8 (Yr5)
	July 2006	8 (Dings only)
FE college students & staff	May 2004	9
Planners	Sep 2004	3
	Jun 2006	5
Primary school children's activity (accelerometry and diaries)		
	Mar 2004	27 (Yr5)
	Jul 2004	15 (Yr4) 15 (Yr6)
	Mar 2006	22 (Yr5)
	Jul 2006	13 (Yr4) 10 (Yr6)

In addition, ongoing monitoring of cycle usage of the cycle-walkway, quantitative monitoring of parking levels and traffic speed, as well as photographic records of physical changes in the Dings Home Zone have been undertaken in collaboration with Sustrans and Bristol City Council.

The evaluation is still in progress. Final results from the follow-up resident survey, accelerometer data and focus groups will be available in the first quarter of 2007. Preliminary findings by Sustrans' own door-to-door surveys indicate that the newly-designed streets in the Dings Home Zone are widely admired by the community residents and that certain factors which may influence people's travel/physical activity behaviour have improved, as for example, perception of safety in the street, neighbourhood aesthetics, concerns over traffic speed, levels of vandalism.

Success factors and challenges

Please note that Sustrans provided information on the implementation of the intervention itself and The University of Bristol on its health-related evaluation

Key factors supporting successful implementation of the intervention:

- Acceptance at the outset by project partners that residents would have final say on the design of their own streets (within budget and engineering constraints).
- An active community with enthusiastic residents who were willing to try out an innovative concept.
- An effective community involvement process with dedicated staff has fostered local skills development, understanding and respect between residents and local authorities.
- Experienced and committed "champions" in each of the key partner organizations who have ensured that the project progressed past all obstacles.
- A wide-ranging skill set across the partners enabling much design work and technical consultation to be done "in house".

Main challenges faced during the implementation of the intervention:

Maintaining resident enthusiasm over the rather long process and keeping the momentum of the partnership in the face of ongoing technical and structural problems. The structural problems, in particular, arose in part from the innovative nature of the project, which meant that standard local authority highways procedures did not always fit the project needs.

With regards to the evaluation of this multi-level environmental intervention:

- Small, baseline sample size which necessitated a high degree of time-intensive researcher contact with all potential participants, so as to maximise response rates, e.g. on-going contact with the local school, multiple attempts at recruiting adults from the community
- High respondent burden, particularly in view of repeated measures and some participants being subjected to multiple feedback requests from other partners and via community initiatives since the area had become part of the 'New Deal for Communities' catchment
- Fluctuating and elongated progress with the build/works, meaning that data collection schedules needed to be continually adjusted and further funding had to be sought, so not to jeopardise availability of post-intervention data sets
- Inability to evaluate the impact of the intervention on other ('all') potential users, such as resident adolescents, commuters or people living/working in surrounding urban suburbs
- The dynamics of a changing residential mix and other, related confounders such as an unpredictable housing market and possible early indications of gentrification

- Various limitations with research methods, particularly in terms of suitable, available measures for free-living members of such a community

Key experiences

Key experiences with regards to the implementation of the intervention:

- The large number of partners involved in a project of this type requires time for effective communication and the process benefits greatly from the involvement of an organization (Sustrans in this case) which is independent of the local authority.

- Residents taking ownership of how their streetscape should function has a very wide variety of valuable and significant benefits – but the residents will need support and nurturing to be effective.

- This project has demonstrated that with a good working structure, a community can be involved in all stages of planning a re-design of the public realm, ensuring that the new space reflects their needs and desires for their communal space. The many innovative design details, including new types of drainage systems, artworks, trees and other planting being placed within the street, provide good examples of how streets can be made multi-functional and attractive living spaces.

- The project has allowed for a very important collection of data about the built environment and its effect on levels of physical activity. It will contribute to the growing evidence about the impact of urban design and transport planning to a population's health. We recommend that research specialists should be involved very early in project planning – these could be in various sectors, including public health and physical activity, climate change and emissions reduction, road safety, and social and community areas.

- The health sector is not directly involved in the project. It would be desirable, though in the UK difficult, to get funding from public health budgets for projects of this type.

- Specific efforts/initiatives to involve young people are rewarded with an intensified feeling of 'ownership' by the community.

- Regular steering group meetings with all stakeholders are needed to share information and update on progress.

- Community involvement events need to be carried out in streets/local area and at convenient times to ensure high rates of participation. These events may also need incentives (such as street parties) to attract greater participation.

Key experiences with regards to the planning and executing of the evaluation:

- Research teams and funding bodies must be prepared to adapt to set-backs in original plans due to circumstances beyond their control (e.g. time-scales and even physical/design modifications).

- The wider geographical area needs to be considered, for example in terms of: access to public and active transport links (for walking and cycling), proximity to key destinations and the availability/nature of important amenities such as food shops, purpose-built exercise facilities. Measuring such parameters would be recommended when possible. Such features

(which themselves might or might not be subject to urban modification) are likely to have continuing bearing on residents' health and sense of well-being.

- The research team should be prepared to acknowledge the implications of a large number of partners involved in a project of this type. Examples include but are not limited to: time required for effective communication; the effect of the actual process on residents and other stakeholders; partners' differing agendas, evaluation tools, expectations for outcomes and accountabilities.

- Residents may not only need support and nurturing for the intervention itself to be effective, but may need time-intensive encouragement from the research team to participate in evaluation. This team should be prepared to be transparent with its objectives/requests and provide feedback to the community.

- It is important to bear in mind that in the case of such urban interventions, positive outcomes may not be of a nature that were expected, or measured, and will vary between different (potential) users. Processes of change might also occur among residents. Therefore the difficulty, in public health terms, is that it is not possible to make sweeping generalisations about the value of such an intervention in any one respect, or for any one sub-group of the local population.

- Early involvement of public health researchers should be replicated, as additional evaluations of home zones (and other environmental interventions) are required to build on the scant evidence base and work towards future recommendations around residential interventions for public health benefit.

Transferability of the intervention

Many parts of this intervention are relevant elsewhere. Other home zones have been developed across the UK and, indeed, certain other countries, particularly in northern Europe, are more advanced than the UK in the development of home zones and similar residential improvements. The multi-sectoral approach to this project and high commitment to partnership-working could be repeated elsewhere. Early involvement of public health researchers can and should be replicated with sufficient foresight and funding opportunities.

Sustainability of the intervention

The physical changes are permanent and some (e.g. planting) will continue to mature over time. New residents who arrive in this residential area should benefit from the improvements.

Wider implications for the original, local population are unclear given that the modified components (home zone and cycle-walkway) are just two pieces of a jigsaw of wider, urban regeneration and given the context of potential demographic shifts. Although the intervention is likely to be sustainable, without the opportunity to return to the neighbourhood to conduct further research, it is difficult to confirm the sustainability of the intervention over time.

The high capital and revenue costs associated with implementing a full retro-fit home zone (i.e. transforming existing, already inhabited streets) mean that it will be difficult to fund replicating such interventions in more areas which could benefit from such action. For this reason, Sustrans is piloting a new, much lower cost approach, under the name "DIY Streets" (DIY is British shorthand for Do It Yourself). This may allow much wider replication of the principal social, environmental and health gains aimed for in this project.

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Spen Valley Greenway, United Kingdom

Country: United Kingdom - England

Timeframe of implementation: 2000-2002

Population level

Local level

Setting

Urban fringe and connecting town and village centres in north Kirklees district via the Spen Valley communities of: Thornhill Lees, Dewsbury Moor, Heckmondwike, Liversedge, Cleckheaton, Oakenshaw.

The approximate population of the electoral wards through which the route passes includes 60 000 inhabitants (some 17% of the total Kirklees population).

Target groups

- Residents in the Spen Valley communities: Dewsbury Moor, Heckmondwike, Liversedge, Cleckheaton, Oakenshaw (for local journeys).
- Some cycle commuter use for longer journeys
- Visitors from wider West Yorkshire area

The route is used by an active cross-section of the whole population: children (journeys to school), adults, older people, people with mobility difficulties.

Objectives

Objectives of the Spen Valley Greenway intervention were to:

- Regenerate the Spen Valley.
- Provide a sustainable transport corridor for walking, cycling and horse-riding with good links to local highway network and urban/ residential areas.
- Provide a green corridor - linear park - connecting urban areas with urban fringe/ countryside.
- Promote active travel and increased levels of walking and cycling for transport and leisure.

Intervention

An 11 km long, 2.5 m wide traffic-free greenway was built on a disused rail corridor connecting the communities Thornhill Lees (canal towpath), Dewsbury Moor to Oakenshaw, near Cleckheaton. The route is landscaped and features a number of unique sculptures, seating, signs and artworks, made by local and national artists. There are many access points to existing residential areas and town/village centres. New access points are negotiated as land alongside the route is redeveloped for housing.

Tree planting has taken place to improve habitats. Tree management has taken place to protect railway bridges for maintenance reasons. Activities have been organized to promote use of the route.

Before

After

Political commitment

Local elected members (Councillors) of the project planning committee who were in opposition at the time of the project implementation were vocal and supportive of investment in the route. A local cycle organization, the Kirklees Cycling Forum and CTC (http://www.ctc.org.uk), were supportive of intervention to protect the rail corridor from detrimental development and to promote the creation of a cycle route. Moreover, a local Spen Valley Member of Parliament, Mr Mike Wood MP, set up a Spen Valley Line Forum to protect the rail corridor for future transport use.

The Spen Valley Greenway project took place in the context of implementing the regional Local Transport Plan (West Yorkshire) and local council priorities, as well as in the context of implementing Sustrans Yorkshire regional/national aims in respect of the National Cycle Network (www.sustrans.org.uk).

Funding

Funding came from central government (Department of Transport) through the Local Transport Plan that is to fund local highway authorities, as well as Yorkshire Forward. The latter is the Regional Development Agency responsible for improving the Yorkshire and Humber economy.

Stakeholders

The Kirklees Metropolitan Council was the leading agency responsible for implementing the Spen Valley Greenway project. As a local authority it involved Highways & Planning Services council officers (planning & design) as well as elected members (securing political support & funding).

The transport sector was represented by Sustrans (the UK's leading sustainable transport charity) which was responsible for land negotiation and the design/ building of the Spen Valley Greenway. The Department of Transport (DfT) was also involved as funding partner for the project.

The health and physical activity promotion sector (e.g. local authority 'Physical Activity Development Team) helped to promote the project. For example, council officers in Leisure Services helped with getting the community engaged and promoting of the Spen Valley Greenway route.

Other partners involved were:
- Local Member of Parliament
- Local elected members (these are local politicians elected by the local community to represent different electoral wards in the district)
- The community including residents in the local area and special interest groups (e.g. horse riders, public rights of way groups, schools).

The artworks programme was funded and coordinated by
- Arts Council England
- Kirklees Metropolitan Council
- Henry Moore Foundation (to advance the education of the public by the promotion of their appreciation of the fine arts and in particular the works of Henry Moore – http://www.henry-moore-fdn.co.uk)
- Sustrans
- Public Arts (a company dedicated to the imaginative understanding and improvement of the public realm – http://www.publicarts.co.uk/intro/intro.asp)

In general, local politicians, an MP (Member of Parliament), and a local cycling organization were particularly proactive in driving the project forward.

Evaluation

The Spen Valley Greenway project was evaluated using the several data such as:

Kirklees Metropolitan Council Scrutiny Panel:
Assessment via interview/evidence of partners, community and user's views of the project and lessons learned.

Sustrans Users Surveys (2001 & 2004):
Number of users, mode of travel, trip origin and destination, opinion of route, manual count data during the survey periods

Automatic cycle counters:
Number of cyclists using route at three locations (data from 2005 onwards)

Evaluation findings revealed that overall the Spen Valley Greenway was well received by the local community and very popular. Findings from the Sustrans National User Surveys (2001 & 2004) showed that the number of local people who cycle and walk to school, work and shops increased. There was also an increase in leisure-time cycling and walking. Among 2069 users recorded via survey, 57% were cyclists and 41% pedestrians.

Moreover, 246 interviews conducted in Spen Valley as part of the Sustrans National User Survey showed that

- 28% of cyclists claimed that they were new to cycling or starting to cycle again.
- 62% of users classified themselves as experienced cyclists.
- 38% of all trips were for a particular purpose, 62% for recreation.
- 79% of route users said that the route helped them to take regular exercise.
- 25% of users said that they could have used a car to make their journey but chose not to.
- the most commonly cited influence on users' choice of route was safety (40%).

The Scrutiny Panel showed that the Spen Valley Greenway provided a safe route to schools in the area, reduced child accident statistics, provided a wildlife corridor through the Spen Valley, and increased the sense of community 'cohesion' and well-being in the communities.

Heckmondwile Grammar School uses the path for cross-country runs, PALS (fitness club for inactive adults prescribed activity for health benefit) for open air cycle and walking sessions. The Cleckheaton Medical Centre "prescribes" gentle exercise on the Greenway. A local hospice support group organizes an annual sponsored jog, walk and bike ride event. The local CTC (Cyclists Touring Club, but an organization with a much wider remit in current times) group/council organized bike rides.

Success factors and challenges

Key factors supporting successful implementation of the Spen Valley Greenway intervention were:

- Wide cross section of support,
- Availability of land and securing of planning permission,
- Partnership with Sustrans,
- An existing national framework of support for cycling at the time (i.e. the National Cycling Strategy via Department for Transport),
- Availability of funding as well as a ring-fenced maintenance budget.

Challenges faced during the implementation of the project were:

- Public expectation,
- Incomplete consideration given to horse rider's needs,
- With hindsight, a broader more holistic view of the project could have been taken to secure better improvements in terms of habitat and biodiversity of corridor vegetation.
- Constraint on funding for additional amenity features.

Key experiences

- Early consultation with the local community was an important factor that contributed to the project success.
- Good support from Kirklees Metropolitan Council and local councillors.
- Good collaboration between Sustrans and Kirklees MC which has set the framework for future joint working
- Some conflicts between different user groups (e.g. dog walkers, walkers and cyclists sharing the space – desegregated use)
- Lessons learned about specific surfacing requirements of the path for horse riders

Transferability of the intervention

The 'model' of the Spen Valley Greenway has already been adopted for the development of other greenway routes on disused rail corridors and canal/river corridors in the UK. However, other greenway routes are not quite as straightforward to implement as the Spen Valley Greenway due to complexities of land ownership and character/topography of other rail corridors. Many aspects of the Spen Valley Greenway project though can be used to form a model for future cycle paths, such as strong community and local member involvement.

Sustainability of the intervention

The project has proved to be sustainable in the first four years following completion of construction. The Spen Valley Greenway route and the parties involved have 'evolved' to meet new opportunities and demands. There is ongoing maintenance of the Spen Valley Greenway by Sustrans Warden and voluntary rangers.

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Winsford BMX Track and Skate Park Cheshire, United Kingdom

Country:	United Kingdom
Timeframe of implementation:	2001 – 2003 fund-raising and build Ongoing – utilisation and engagement

Population level

The Winsford BMX Track and Skate Park project was a local community project but also received sub-regional interest.

Setting

The project was implemented in the Mount Pleasant Estate in Winsford, Cheshire, United Kingdom. Cheshire is a suburb within a small market town.

Target groups

The project was targeted to children and adolescents.

Objectives

The key objectives of the Winsford BMX Track and Skate Park project were to

- understand the needs and aspirations of the local community,
- establish a collaborative and enabling partnership,
- develop a clear vision for the green space,
- develop political support and links,
- encourage young people to become actively involved in the regeneration and improvement of their local area,
- establish long-term management, viability and sustainability arrangements,
- be innovative, incorporating lifelong learning,
- provide imaginative provision of play space for different user groups.

Intervention

Groundwork began by developing a collaborative partnership of key groups and agencies in the area, including local councilors. This group carried out a scoping exercise which identified both suitable sites and potential methods of involving young people.

Young people were targeted through their schools, but crucially, also by directly approaching them in meeting areas, such as near the local shops.

Plans of the estate were discussed with young people and informal visits to various areas of green space were held to explore the potential (and the pitfalls) of each site. This work was done through a collaboration between Groundwork community staff, landscape designers, teachers, youth workers, and leisure service officers.

It soon became apparent that local young people wanted something more adventurous than a standard play area. A ‘Design Group’ of local young people was set up which examined the issues. They argued for a skate/BMX area, as the majority of young people in the area possessed either bikes, skateboards, in-line skates or scooters, but lacked a place to use them. The young

people petitioned the local authority for such a facility, but the Leisure Services Department, while expressing support, lacked the budget for such a major scheme.

A site was identified and initial discussions with Vale Royal Borough Council, the landowners, were promising. Coincidentally, the site bordered Woodford Lodge High School, which became excited about the young people's ideas. The school hoped to become a specialist school for sports and needed additional sports facilities.

Two consultation sessions were held in the town centre, attracting more ideas and more young people for the Design Group. The group, now 30-strong, were taken to visit a similar facility in the neighbouring town of Crewe. They had the chance to try out the track and to discuss the implications of running a club to manage the site.

Young people then began to work with a landscape architect to plan the layout of the site. Some initial, wilder ideas had to be discounted for health & safety reasons. Consensus emerged around a design which included a large BMX track and a smaller skate park with a teen shelter, plus a club room/storage facility underneath the start ramp, lighting and fencing.

Following a major push for funding by Groundwork and a tender procedure, the work started in Spring 2003. The Borough Council, which saw the project as crucial to the implementation of their play and sports strategies, provided the final £10,000. The result is a BMX track that is suitable for regional race events and a skate park that is also well used.

Completion of the site was only part of the story. It was clear from the start that we needed to make the project sustainable – and that would need strong community input. Work began with local people to set up the Gravel Grippers Club, run by a committee of parents and experienced riders. There are 75 members of the club who have all undertaken training. The club meets three times a week, but the site is used constantly. Some of the parents have now undertaken cycle coaching training and are qualified coaches. They work with skilled BMX riders to teach skills to the club members. Young people, supervised by the club officials, are keeping the track topped up where it is wearing, and looking after the site. The club is now securing its own funding to make minor improvements. A local business sponsored the club and this money was then matched by the charity Sportsmatch. To ensure that no-one is excluded through financial circumstances, the club has bought bikes and safety equipment that can be loaned out.

A regional BMX event was held at the end of September 2003, with others following in 2004. Seven riders qualified for the British Championships in Cheddar (three were in the top ten nationwide) which is a terrific achievement for the young riders and club after only a few months of competing.

According to the local Police Community Action Team, the level of anti-social behaviour on the estate has reduced since the completion of the track. School teachers have also commented on the increased level of attendance by club members and an improved level of attention in the classroom.

Success has brought further rewards. The club was chosen as a pilot for Barclays Spaces for Sport programme and a development plan was produced. It was chosen as a National Demonstration Project for the Office of the Deputy Prime Minister.

Before

After

Political commitment

Local councillors and officials provided political commitment for the implementation of the project.

Funding

Financial support came from a range of organizations within the public, private and third sectors (NGOs):

- Office of the Deputy Prime Minister ODPM,
- United Utilities,
- Waste Recycling Environmental,
- Barclays Bank, Cheshire Constabulary,
- Henkel,
- Sameday Plc,
- Snoozzzeee Dog Plc,
- Vale Royal Borough Council,
- Weaver Vale Housing Trust,
- Winsford Town Council,
- Sportsmatch (charity),
- Local Network Fund.

Stakeholders

Various organizations were involved in the implementation of the Winsford BMX Track and Skate Park project:

- Vale Royal Borough Council,
- Cheshire Constabulary,
- Cheshire County Council,
- British Cycling Federation,
- Office of the Deputy Prime Minister,
- Over Residents Association,
- Weaver Vale Housing Trust,
- Winsford Town Council,
- Woodford Lodge High School.

Groundwork Cheshire was the leading agency responsible for implementing the project. Other driving forces involved in the project were the community itself.

Evaluation

No formal evaluation has been undertaken of the project.

Success factors and challenges

Key factors supporting successful implementation of the project were effective partnership working and community determinations.

Challenges faced during the implementation of the project were to implement the project in spite of initial budget constraints, to get community members fully involved in the implementation and to ensure sustainability of the project.

Key experiences

- A strong partnership/steering group is essential to guide a project over several years.

- Consultation is not a one off event, it is an ongoing activity. If we had progressed initial ideas we would not have achieved our end result.

- Try to involve the wider community, not just the potential users as this can help to resolve any possible misunderstandings that could arise at a later date. It is important to visit other similar projects and learn lessons from them.

- Ensure that there is a suitable contingency fund of about 10% in the contract as there may need to be flexibility once building begins. Do not be scared to think big, but make sure that you are clear with those involved that this may mean that the project will take longer – and do not raise unrealistic expectations! Involve the Royal Society for the prevention of Accidents (ROSPa) at an early stage to ensure that they will be able to approve the project when it is completed. And make sure an experienced rider is involved in the design process and present at the site during construction.

- Once the facility has been built, do not expect it to be static. Over time, some tweaking of the track and equipment may be needed to ensure that it continues to attract people and offer new challenges.

- Sports like this can be expensive for people to take part in. Plan for funding to ensure that equipment is available for local people.

Sustainability of the intervention

The project can be considered as sustainable, it has now secured revenue funding to support activities and maintenance.

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Community Environment Programme East Manchester, United Kingdom

Country: United Kingdom

Timeframe of implementation: Programme began in 1997 and is ongoing

Population level

The Community Environment Programme (CEP) is implemented at the district level, in the neighbourhoods of East Manchester.

Setting

The neighbourhoods of East Manchester have been in steady decline as a result of the collapse of the traditional industrial base. The area suffers from long-term unemployment and a disinclination among residents to move into higher education or training. The housing stock has little demand and apathy has led to fear of crime. It sits to the East of Manchester City Centre in the lea of the large scale regeneration which followed the Manchester Commonwealth Games in 2002.

Target groups

The programme is targeted to the whole Population.

Objectives

- Provide public open space
- Provide recreational facilities
- Reduce fear of crime
- Reduce problems of community safety
- Strengthen links between groups of residents
- Tackle issues such as low skill levels and lack of training opportunities

Intervention

The Community Environment Programme began in East Manchester in 1997 following a detailed consultation process with residents. The consultation process revealed that there is a lack of public open space, fear of crime, problems of community safety, as well as a lack of recreational facilities in the area. It also revealed the need to strengthen the links between groups of residents and to tackle issues such as low skill levels and a lack of training opportunities.

The Community Environment Programme usually funds so called ‘community link officers’ to work within a specific target area, whether this is a cluster of streets or an individual ward or district. The community link officer’s role is to identify the needs of residents and to work closely with individuals and groups in order to deliver a wide range of environmental projects (e.g. recycling initiatives, landscaping work, the creation of parks and play areas, alley-gating schemes).

Work continues after the physical landscape of the community has improved by developing the skills and capacity of people to continue the process of change. The work is always conducted in partnership with other agencies and service providers. The experience has shown that effective regeneration demands a partnership approach that combines the skills and experience of a range of experts including residents, housing associations, the police and local authorities.

The Community Environment Programme is locally responsive and therefore takes a different form in each area. The programme process, however, is always similar including the following key components:

1. Engaging communities and generating ideas

- Organizing participative workshops, residents meetings and drop-in sessions
- Supporting existing fora such as tenants' and residents' associations
- Door to door liaison by Groundwork community link officers
- Establishing links with community leaders and local councilors
- Site visits with residents' groups to demonstrate what can be achieved

2. Planning with the community

- Exploration of the main issues affecting community well-being in the area
- Identification of the needs of the community
- Production of draft action plan
- Consultation over the plan with the residents and key agencies
- Allocation of funding / fundraising
- Determination of roles and responsibilities

3. Action on the ground

- Derelict, neglected and abandoned land brought back into community use
- Housing improvements, including energy efficiency measures and security
- Transformation of alleyways behind rows of terraced houses
- Landscaping to prevent joy riding and crime
- Creation of park areas, play facilities and community gardens
- Street maintenance, litter picking and clean ups
- Community artwork, murals, mosaic and sculpture
- Environmental campaigns, awareness raising and educational work

4. Further support – self-sufficiency

- Training and skills development for community leaders and residents
- Developing ability to maintain momentum and motivate others
- Encourage stewardship and ownership of the regeneration process
- Support residents to take the process forward themselves

An example of the work of the Community Environment Programme is New Century Garden in East Manchester. The work to create the garden has transformed an area of neglect and dereliction that had become a haven for joy riders, fly-tipping and nuisance behaviour into a safe, clean, attractive space for local residents and their children. The garden, surrounded by 36 houses, has acted as a catalyst to revive a sense of community spirit amongst residents, with neighbours now having a common role and purpose to maintain and develop the area. Residents have formed a community group to maintain the site which is now the centre point for community activities and social gatherings.

Political commitment

The Manchester City Council and the Office of the Deputy Prime Minister provided political commitment for the implementation of the Community Environment Programme.

Stakeholders

Governmental and non-governmental organizations such as New Deal for Communities (a government initiative), Countryside Agency (Government Agency), Manchester Housing (Arms Length Housing Management Organization, European Regional Development Fund as well as residents' groups were involved in the implementation of the Community Environment Programme.

The leading agency responsible for programme implementation is Groundwork Manchester Salford and Trafford. The other driving forces were New Deal for Communities, and the residents of the targeted communities.

Funding

Funding came from New Deal for Communities, Countryside Agency, Manchester Housing, ERDF as well as residents' groups.

Evaluation

There is no systematic and formal evaluation of the implementation of CEP (e.g. in terms of physical activity impacts).

However, the perception and experiences of Groundwork staff indicate that as a whole, the Community Environment Programme has had significant positive impacts in East Manchester.

For example, physical impacts include landscape improvements, cleaner, greener streets, new community gardens, vibrant parks and play areas. Social impacts include increased community stability and cohesion, a sense of renewed confidence in the area and a high level of volunteering and participation. Economic impacts include the creation of a more desirable area for business investment, an improved image, support for social enterprise and direct support of local companies through Groundwork's Business Environment Association.

To date, over 2 000 houses in East Manchester have benefited from Groundwork's allegating scheme, conducted as part of CEP. By installing gates at the end of alleyways running behind streets of houses, the projects have helped reduce nuisance behaviour, deter drug users and vandals and residents expressed that they feel safer and more secure since the gates were installed.

Success factors and challenges

Key factors supporting successful implementation of the Community Environment Programme:

- Community involvement
- Availability of revenue funding

Key experiences

- In 2002, Groundwork's Community Environment Programme was awarded a British Urban Regeneration Association Award, a national award that recognizes best practice in regeneration.

- The changes experienced though the programme were described to one judge, by a local resident, as "like winning the pools'. A key experience from the Community Environment Programme is that enabling fractured and damaged communities to be self-sufficient requires revenue streams that fund community workers to work with local people over a number of years.

- The partnership approach has shown to be effective in helping reduce crime, prevent vandalism and helping generate a renewed sense of community spirit.

Sustainability of the intervention

Following the success of the Community Environment Programme in East Manchester, projects are now up and running in other areas of Manchester (in Salford and Trafford) with the support of a team of designated community link officers.

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Annex 3

LIST OF PARTICIPANTS OF THE EXPERT MEETING

WORLD HEALTH ORGANIZATION
REGIONAL OFFICE FOR EUROPE

WELTGESUNDHEITSORGANISATION
REGIONALBÜRO FÜR EUROPA

ORGANISATION MONDIALE DE LA SANTÉ
BUREAU RÈGIONAL DE L'EUROPE

ВСЕМИРНАЯ ОРГАНИЗАЦИЯ ЗДРАВООХРАНЕНИЯ
ЕВРОПЕЙСКОЕ РЕГИОНАЛЬНОЕ БЮРО

EUROPEAN CENTRE FOR ENVIRONMENT AND HEALTH
BONN OFFICE

WHO technical meeting on "Tackling obesity by creating healthy residential environments"

Bonn, Germany, 29-30 November 2006

Temporary advisers

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