

NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE

PUBLIC HEALTH DRAFT GUIDANCE

Promoting physical activity, active play and sport for pre-school and school-age children in family, pre-school, school and community settings

NICE public health guidance **x**

Introduction

The Department of Health (DH) asked the National Institute for Health and Clinical Excellence (NICE or the Institute) to produce public health guidance on physical activity, play and sport for pre-school and school-age children in family, pre-school, school and community settings.

The guidance is for NHS and other professionals who have a direct or indirect role in – and responsibility for – promoting physical activity for children. This includes those with public health as part of their remit working within the NHS, education, local authorities and the wider public, private, voluntary and community sectors. It may also be of interest to parents, grandparents and other carers (including professional carers), children and young people and other members of the public. The recommendations are for children and young people up to the age of 18 years, with a specific focus on those aged 7 and under, girls aged 11 to 18 and their families.

The guidance complements and supports, but does not replace, NICE guidance on obesity, physical activity, physical activity and the environment, depression among children and young people and social and emotional wellbeing in schools (for further details, see section 8).

The Programme Development Group (PDG) has considered both the reviews of the evidence and the economic analysis.

This document sets out the preliminary recommendations developed by the PDG. It does not include all the sections that will form part of the final guidance. The Institute is now inviting comments from stakeholders (listed on the NICE website at: www.nice.org.uk).

Note that this document does not constitute the Institute's formal guidance on promoting physical activity for children. The recommendations made in section 4 are provisional and may change after consultation with stakeholders and fieldwork.

The process the Institute will follow after the consultation period (which includes fieldwork) is summarised below.

- The PDG will meet again to consider the consultation comments, the fieldwork reports and the stakeholder evidence.
- After that meeting, the PDG will produce a second draft of the guidance.
- The draft guidance goes to the NICE Guidance Executive for final sign-off.

For further details, see 'The public health guidance development process: an overview for stakeholders including public health practitioners, policy makers and the public' (this document is available on the Institute's website at: www.nice.org.uk/phprocess).

The key dates are:

Closing date for comments: 15 September 2008.

Next PDG meeting: 8 and 9 October 2008.

Details of membership of the PDG are given in appendix A and key supporting documents used in the preparation of this document are listed in appendix E.

This guidance was developed using the NICE public health programme process.

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1 Key priorities

This section will be completed in the final document.

2 Public health need and practice

Children's participation in physical activity is important for their healthy growth and development. It can reduce the risk of chronic conditions (for example, obesity) and improve their general health and wellbeing. Current guidelines recommend that children should do a minimum of 60 minutes of at least moderate-intensity physical activity each day (DH 2004).

The best way to encourage children to be physically active may differ according to their age, developmental stage and gender. For example, improving children's physical skills and general ability to participate may make physical activity more enjoyable. It may also help increase their activity levels throughout childhood and into adulthood.

Physical inactivity in England is estimated to cost £8.2 billion a year. This includes both the direct costs of treating major, lifestyle-related diseases and the indirect costs of sickness absence (DH 2004). A sedentary lifestyle is also estimated to cause 54,000 premature deaths a year (Department for Culture, Media and Sport 2002). These costs are predicted to rise.

Children and young people's activity levels

Objectively measured physical activity data collected between 2003 and 2005 suggests that a large majority of children aged 11 are not active enough. Only 2.5% of these children (boys 5.1%, girls 0.4%) did more than 60 minutes of moderate to vigorous physical activity daily (the internationally recognised recommendation for children). They were most active in summer and least active in winter (Riddoch et al. 2007). Girls of all ages, but particularly those aged 11 to 15, are less likely than boys to meet the recommendation. The average time girls spend participating in physical activity declines steadily with age (DH 2003).

The number of children walking to school has fallen significantly during the last decade. In 2006, 52% of children aged 5–10 and 41% of those aged 11–16 walked to school. Only 3% of children aged 5–16 cycled to school (Department for Transport 2008).

The 2006/07 'School sport survey' (Department for Education and Skills 2007) found that 86% of pupils surveyed participated in at least 2 hours of 'high quality' physical education (PE) and school sport in a typical week, compared with 62% in 2003/04. (Seventy per cent of them achieved this through curriculum-based activities – up from 44% in 2003/04.)

National policy

Many national policies are relevant to children's physical activity. Important initiatives and targets include:

- 'Choosing activity: a physical activity action plan' (DH 2005). This cross-government plan aims to promote physical activity for all, in accordance with the Chief Medical Officer's report (DH 2004). It encourages physical activity in early years establishments, schools and further and higher education, and aims to extend the use of education facilities as a community resource for sport and physical activity (including out-of-hours). It refers to: travel to school, the National Healthy Schools Programme, school sport, the 'Physical education, school sport and club links (PESSCL) strategy', building community capacity for clubs, coaches and volunteers in community sport, and outdoor play. It is linked to a number of public service agreement (PSA) targets, two of which are relevant:
 - PSA 12 Reducing the rate of increase in obesity among children under 11 as a first step towards a long-term national ambition, by 2020, to reduce the proportion of overweight and obese children to 2000 levels in the context of tackling obesity across the population (HM Treasury 2008a).
 - PSA 22 In addition to at least 2 hours per week of high quality PE and sport in school for all aged 5–16, all children and young people aged 5–19 will be offered opportunities to

- ‘Healthy weight. Healthy lives. A cross-government strategy for England’ (DH 2008a) supports the obesity PSA target. It aims to create a healthy society by bringing together all sectors to promote healthy eating and to help children build physical activity into their daily lives.
- The ‘Child health promotion programme’ (DH 2008b) highlights the importance of improving the health and wellbeing of children, as part of an integrated approach to supporting children and families.
- The National Healthy Schools Programme, school travel, support for cycling, the ‘PE and sport strategy for young people (PESSYP)’ (Department for Culture Media and Sport 2008a) and ‘Health challenge England’ (DH 2006) offer a coordinated ‘whole school’ approach to ensuring the components of good health are a core part of children’s experience in schools.
- ‘Building brighter futures: next steps for the children’s workforce’ (Department for Children, Schools and Families 2008) sets out how the government is further improving the skills and capacity of people who work with children. The aim is to deliver the high-quality, personalised and integrated services detailed in the ‘Children’s plan’ (Department for Children, Schools and Families 2007).
- ‘Every child matters: change for children’ (Department for Education and Skills 2004) focuses on the wellbeing of children and young people from birth to 19. The aim is for every child to have the support they need to be healthy, stay safe, enjoy and achieve, make a positive contribution and achieve economic wellbeing. ‘Time for play’ (Department for Culture, Media and Sport 2006) builds on this. ‘Getting serious about play’ (Department for Culture, Media and Sport 2004) describes cross-government activity to

promote play, work to develop a regional infrastructure for play and local service delivery.

- ‘Playing to win: a new era for sport’ (Department for Culture Media and Sport 2008a) and ‘Before, during and after: making the most of the London 2012 games’ (Department for Culture Media and Sport 2008b). These outline plans to improve everyone’s quality of life through sport. ‘Sport England strategy 2008–2011’ (Sport England 2008) aims to address the fundamental challenges facing sport, particularly community sport, in England. The aim is to improve sporting success in all its forms in England.

Active travel

National policies on active travel and children focus predominantly on school journeys. One aim is to return levels of walking, cycling and bus use to that of the mid-1980s by 2010 (School Travel Advisory Group 2000). Recently, the emphasis has shifted from safe routes to schools to school travel plans (STPs). A joint Department for Education and Skills and Department for Transport target is for all schools to have an approved STP by March 2010 (Department for Education and Skills 2003).

However, the distance pupils travel to school has increased since the 1988 Education Reform Act and a high court judgement (*Regina v Greenwich* 1989) related to the act (Department for Transport 2008). This will have reduced opportunities for walking and cycling to school. (The act established grant-maintained schools and endorsed parental choice. The high court judgement ruled that it was unlawful for a local authority to view potential pupils living some distance away from a school less favourably than those living nearby.)

Non-government initiatives

Non-government initiatives to encourage children and young people to be physically active are also common in England. Some of the organisations working in this area are:

- The Children's Play Council which runs Play England, a 5-year project aiming to provide free, inclusive, local play provision and play spaces. It also offers a 'Neighbourhood play toolkit CD-ROM' and its home zones initiative aims to make streets more attractive to pedestrians and cyclists by introducing traffic calming, parking areas, benches and play areas.
- Youth Sport Trust which runs physical activity programmes such as 'Start to play' and the TOP series of linked and progressive schemes for children and young people aged 18 months to 18 years. It includes resource cards, child-friendly equipment and quality training and support for teachers and deliverers.
- The British Heart Foundation, which runs initiatives and provides resources. These include: the 'Healthy schools physical activity toolkit' which is linked to the National Healthy Schools Programme; 'Get moving, get active participation award', a foundation key stage 1 participation award, developed with the Youth Sport Trust; and the 'Childs play' early years booklet (offering parents advice on physical activity and healthy eating).

While the examples above are by no means exhaustive they demonstrate the current plethora of policies, initiatives and resources. However, many of them focus on sport and sporting opportunities; only a minority appear to promote lifetime physical activity or focus on lifestyle and unstructured activities (Cale and Harris 2006).

3 Considerations

The PDG took account of a number of factors and issues in making the recommendations.

Value of physical activity

- 3.1 Physical activity is important for children and young people's physical, social and psychological development.
- 3.2 The PDG recognises and supports the Chief Medical Officer's recommendation for children and young people (60 minutes moderate-to-vigorous daily physical activity [(MVPA)] as a minimum requirement. Recent evidence (one paper, in particular) has recommended 120 minutes per day for children aged 9 and 90 minutes per day for young people aged 15.
- 3.3 All children and young people should have the opportunity to be involved in physical activity and should be encouraged and supported to participate. Provision and support should be available irrespective of disability, religion, ethnicity, social, economic and other circumstances.
- 3.4 The PDG believes that children and young people will only be motivated to increase and sustain their physical activity levels if they enjoy being physically active – and are confident in their own ability to participate.
- 3.5 When encouraging younger children to be physically active the focus should be on fun, enjoyment and active participation, rather than on the need to understand rules, play to fixed formats or master complex skills.
- 3.6 The PDG recognised that the recommendations are more likely to be implemented if they support current policies that advocate physical activity.

Children and young people's needs

- 3.7 Children and young people need opportunities (time, space, facilities, equipment and license) to be sufficiently physically active. They can be physically active through play and other spontaneous activities, as well as by taking part in structured or organised programmes.
- 3.8 Children and young people need to take risks and challenge themselves when involved in physically active play, sports and other activities, so they can learn their own boundaries. It was not within the PDG's remit to consider what might constitute an acceptable level of risk for children and young people when undertaking physical activity in different settings.
- 3.9 The PDG recognised that activities need to be tailored to children and young people's developmental age. Activities also need to be sensitive to culture and gender issues and take individual needs and preferences into account, while encouraging them to explore a variety of options.

Factors that encourage or hinder physical activity

- 3.10 Parents, carers and other family members have a crucial role in encouraging young children to be physically active and in developing their motor skills. They can do this by providing opportunities for physically active play, playing active games with them and providing practical support (such as help to set up equipment and providing transport). Generally showing an interest and acting as positive role models is also important.
- 3.11 Helping children and young people to be involved in the design of activities or play spaces is an important way of encouraging them to be more physically active.
- 3.12 Peer pressure is an important influence and can serve to

encourage or discourage physical activity.

- 3.13 Children and young people's opportunities to be physically active can be affected by both environmental and social factors. Perceptions about the weather can also affect whether or not they participate in physical activity.
- 3.14 Contemporary society is generally perceived as risky. Media reporting and a private and public culture which emphasises health and safety, blame and rights have made risk aversion a dominant social value. Many forms of physical activity and play (and the environments where they take place) have inherent risks, some of which can be minimised through the use of safety equipment. Parents' and service providers' fears can prevent children from being physically active; however these may not necessarily correspond to reality. The fear of litigation should an accident occur may mean children and young people are prevented from being physically active. Paradoxically, in the long run, this can put children at greater risk from the conditions associated with lack of activity – such as obesity, heart disease and cancer. The PDG encourages service providers to be compliant with legislation. However, it believes an overly protective and risk-averse approach must be balanced against the physical and psychological benefits associated with physical activity. It also needs to be balanced against the health risks associated with a sedentary lifestyle.
- 3.15 The interests of others in the community need to be taken into account when promoting children's outdoor play, particularly when promoting informal and unsupervised activity in residential areas.
- 3.16 Children and young people who are hard to reach need special consideration. They include:
- Those who are 'not in education, employment or training' (NEET). PDG experience shows that physical activity has been

used to get some of these young people back into education, training or employment. Physical activity programmes may also provide a positive diversion for children and young people who are at risk of offending.

- Looked after children and young people, many of whom move between formal children's homes, foster carers or their own family home. This lack of continuity in their home life reduces their opportunities to access leisure facilities or participate in team sports on a regular basis. In addition, as social groups are hard to maintain this may limit peer interaction and play.
- Children of asylum seekers and travellers, many of whom have limited access to regular leisure, sport and play activities due to their transient lifestyle.
- Young carers – children and young people who are providing care for a family member. The 2001 census identified 175,000 – and many more go unreported. Their responsibilities in the home limit the time they have for socialising with peers and getting involved in play or other types of physical activity.

3.17 The transition between education and employment is a time when young people may have less access to physical activity opportunities.

Limitations

3.18 Many successful interventions involve volunteers (either parents or people from the local community). This raises issues about recruitment, training, continuity of service and sustainability.

3.19 Some interventions may result in children and young people getting involved in a new physical activity at the cost of another one. As a result, they may not increase their overall physical activity level. (For example, a child may decide to participate in a new after-

school physical activity session, but it may mean abandoning another activity later in the evening.) In addition, some of the interventions considered might inadvertently prompt some people to stop using existing physical activity programmes and/or facilities.

- 3.20 For various reasons, it is often difficult and expensive to undertake research with children and young people. For example, it can be difficult to recruit them – due to ethical and access issues – and it can be difficult to measure the factors that influence how physically active they are. The PDG noted that much of the evidence is of low quality. It also noted that measuring the physical activity levels of children (especially very young children) and young people can be problematic.
- 3.21 The PDG recognised that practitioners' opinions about what children and young people want may differ from the reality. It also recognised that it is difficult for practitioners to keep up-to-date with the latest activities that children and young people are interested in.

4 Recommendations

When writing the recommendations, the PDG (see appendix A) considered the evidence of effectiveness and cost effectiveness. Note: this document does not constitute the Institute's formal guidance on this programme. The recommendations are preliminary and may change after consultation.

The evidence statements underpinning the recommendations are listed in appendix C. The evidence reviews, supporting evidence statements and economic analysis are available on the Institute's website at www.nice.org.uk/guidance/index.jsp?action=byID&o=11672

The recommendations below refer to opportunities for moderate-to-vigorous-intensity physical activity. Children and young people should undertake this intensity of activity for at least 60 minutes over the course of a day. This can be accumulated from short, 10-minute (minimum) bouts. It should involve a variety of activities as different types of activity confer different benefits.

Moderate-intensity activity increases breathing and heart rates to a level where the pulse can be felt and the person feels warmer. It might be accompanied by sweating on hot or humid days or when indoors. Vigorous activity results in being out of breath or sweating.

Opportunities to be physically active include everything from competitive sport and formal exercise to active play and any interest that is physically demanding (such as dancing or swimming), as well as the activities involved in daily life (such as walking or cycling).

National policy makers and planners

Recommendation 1

Who is the target population?

Children and young people aged 18 and under, their families and carers.

Who should take action?

The Department for Culture, Media and Sport, the Department of Health, the Department for Children, Schools and Families, the Department for Communities and Local Government, the Department for Transport, the Department for Environment, Food and Rural Affairs, Sport England.

What action should they take?

- Develop a long-term (minimum 5 years) national campaign to promote physical activity among children and young people. The campaign should:
 - be aligned with and support other national health campaigns and strategies such as those for reducing obesity and increasing play and sports participation
 - use formative research to determine the best media vehicles and the most effective messages and language for different populations (for example, families, parents and carers, and children of different ages or facing different circumstances).
- Ensure the campaign is consistent and sustained. It should convey that physical activity:
 - is fun and enjoyable, makes you feel good and can be sociable (that is, it can be undertaken with existing friends or can help develop new ones)
 - can involve a wide variety of formal and informal activities, for example, play, dance, swimming, gym, sport (including street sport and games) and active travel (a mode of transport involving physical activity, such as walking or cycling)

- can (and should) become a regular part of daily life and that small lifestyle changes can be worthwhile (for example, walking to school or the park, using the stairs instead of lifts, helping with the housework and spending less time watching TV)
 - helps develop children’s motor skills
 - can be maintained by trying new and challenging activities to keep children and young people interested and motivated
 - is something that adults, especially parents and carers, should incorporate into their lives to set an example.
- Cascade the campaign’s message down to regional and local areas where examples of regional and local physical activity opportunities should be promoted. Develop resources for regional and local dissemination of the campaign (for example, promotional materials and support for those delivering it). (For more on training see recommendation 8.)
 - Use process and outcome measures to ensure local and regional campaigns are delivered correctly and effectively. For recommendations on the principles of evaluation, see ‘Behaviour change at population, community and individual levels’ (NICE public health guidance 6).

Local policy makers and planners

Recommendation 2

Who is the target population?

Children and young people aged 18 and under, their families and carers.

Who should take action?

Directors of children’s services, chairs of children’s trusts and chairs of local strategic partnerships.

What action should they take?

- Ensure children and young people's plans, sustainable community plans and strategies and local development frameworks explicitly address the need for children and young people to be physically active.
- Ensure there is a coordinated local strategy to increase physical activity among children and young people, their families and carers. The strategy should help achieve local area agreement targets and should ensure:
 - there are safe, local indoor and outdoor opportunities for physical activity
 - individuals responsible for increasing physical activity levels are aware of national and local government strategies as well as local plans for increasing physical activity
 - partnership working within local physical activity networks is developed and supported to establish and deliver multi-component interventions involving schools, families and communities. (Partners may include: schools, colleges, out-of-school¹ and play services, youth services, further education, community clubs and groups and private-sector providers)
 - local factors that help children and young people to be (or which prevent them from being) physically active are identified and acted upon
 - local transport and school travel plans are coordinated so that all local journeys can be carried out using a form of travel involving physical activity.
- Ensure physical activity initiatives for children and young people are regularly evaluated. Evaluations should:
 - record any changes in physical activity, physical skills and health outcomes, such as body mass index (BMI)
 - monitor progress towards local area agreement targets.

¹ Out-of-school services are defined as those providing activities that take place outside the formal school day. They could involve using school facilities during the evening, weekends and school holidays or providing activities as part of extended school services.

- Identify a senior council member to be a champion for children and young people's physical activity. They will:
 - promote their cause across council portfolios
 - ensure physical activity is a key priority when planning local authority programmes
 - liaise with council members who have lead responsibility for relevant departments to promote partnership working (for example, transport, leisure and health teams)
 - explain to the public the local authority's role in promoting physical activity.

Recommendation 3

Who is the target population?

Children and young people aged 18 and under, their families and carers.

Who should take action?

- All local authority departments and other local strategic partnership agencies responsible for facilities and services that provide opportunities for children and young people to be physically active.
- Policy makers and planners working in the public, voluntary, community and private sectors.

What action should they take?

- Identify groups of local children and young people who are likely to be doing less than one hour of moderate-to-vigorous physical activity a day. Use the best available evidence, including local knowledge, to achieve this. Use the resulting information to inform planning.
- Regularly consult with different groups of children and young people and their families, especially those who are likely to be less physically active, to understand the local factors that help children and young people to be (or which prevent them from being) physically active.

- Use information gathered from local consultation to increase opportunities for children and young people to be physically active. (For example, by feeding into local plans on transport, open spaces and the provision of sport, dance and play facilities).

Recommendation 4

Who is the target population?

Children and young people aged 18 and under, their families and carers.

Who should take action?

- Directors of planning and regeneration.
- Planning and regeneration service managers, project managers and those involved in developing the 'Unitary development plan' (UDP) or other strategic planning documents.
- Directors of leisure and cultural services.
- School governors, office managers and other decision-makers involved with buildings and outdoor spaces within the public, voluntary, community and private sectors.

What action should they take?

Liaise with local strategic partnerships to ensure:

- Physical activity facilities are suitable for children and young people with different needs and their families, particularly those from low socioeconomic groups, some minority ethnic groups and those who are disabled. (For more on local strategic partnerships see recommendation 3.)
- Children and young people are provided with safe spaces and facilities (both indoors and outdoors) where they can be physically active. These could be provided in the public and private sectors (for example, in schools, youth clubs, on local business premises and at private leisure facilities).

Local authorities should coordinate availability of these spaces and facilities.

- School facilities are available to children and young people before, during and after the school day, at weekends and during school holidays. These facilities should also be available to public, voluntary and private-sector groups and organisations offering physical activity programmes.
- The use of non-traditional settings for physical activity is encouraged, for example, office car parks outside office hours.
- Town planners make safe provision for children, young people and their families to be physically active in an urban setting. Provision should encourage new activities which are appealing to children and young people (for example, in-line skating). Town planners should also ensure open spaces and outdoor facilities make use of the outdoor environment to encourage physical activity.
- Spaces and facilities used for physical activity meet or exceed recommended safety standards for design, installation and maintenance. For example, outdoor playgrounds should have areas of shade from the sun and sheltered areas where children can play to reduce the impact of adverse weather.

For further recommendations on the environment, see 'Promoting and creating built or natural environments that encourage and support physical activity' (NICE public health guidance 8).

Recommendation 5

Who is the target population?

Children and young people aged 18 and under, their families and carers.

Who should take action?

Local transport bodies (for example Transport for London), transport planners, road safety officers and school travel plan advisers.

What action should they take?

- Liaise with the local strategic partnership to ensure local transport and school travel plans are fully aligned with other local authority plans which may impact on children and young people's physical activity. This includes local area agreements.
- Ensure local transport plans are developed with local authority departments and other agencies that provide spaces and facilities for children and young people to be physically active.
- Ensure local transport plans make specific reference to children and young people. They should aim to increase the numbers who regularly walk, cycle and use other modes of travel involving physical activity.
- Work with schools to develop, implement and promote school travel plans. This may, for example, include mapping safe routes to school and organising walk- and bike-to-school days, walking buses and cycle training.
- Organise training courses for school travel plan advisers.
- Identify any aspect of transport policies which discourages children and young people from using active travel (travel involving physical activity, such as walking or cycling). For example, policies that aim to keep traffic moving may make it difficult to cross the road. Consider how these policies can be improved to encourage active travel.

Local organisations**Recommendation 6*****Who is the target population?***

Children and young people aged 18 and under, their families and carers.

Who should take action?

Public, voluntary, community and private-sector managers and decision-makers responsible for – or able to influence – opportunities for children and young people to be physically active.

What action should they take?

- Identify local factors that may affect whether or not children and young people are physically active.
- Find out what type of physical activities children and young people enjoy, based on research or local consultation. In response, plan physical activities that children and young people want to participate in (for example, some children might prefer non-competitive or single-gender activities).
- Remove locally identified barriers to participation, such as lack of privacy in changing facilities, inadequate lighting and poorly maintained facilities. Any dress policy should be practical, affordable and acceptable to participants without compromising their safety or restricting participation.
- Provide regular, local and well-publicised physical activity programmes in safe and challenging environments (both indoors and outdoors). They should be run by people with the relevant training or experience.

Recommendation 7***Who is the target population?***

People involved in running physical activity sessions.

Who should take action?

Employers or supervisors of people who run physical activity sessions.

What action should they take?

- Ensure informal and formal physical activity sessions for children and young people (including play) are led by staff or volunteers who have achieved the relevant sector standards or qualifications for working with

children. (For example, they should meet the criteria in relation to child protection and health and safety.)

- Ensure staff and volunteers have the skills (including interpersonal skills) to design, plan and deliver play and physical activity sessions that meet children and young people's specific needs and circumstances. Sessions should be inspiring and enjoyable and should encourage personal development.
- Use community networks and partnerships to encourage, develop and support local communities and volunteers involved in providing physical activities for children and young people. For recommendations on the principles of networking and partnership working, see 'Community engagement to improve health' (NICE public health guidance 9).

Recommendation 8

Who is the target population?

People involved in running physical activity sessions.

Who should take action?

Employers or supervisors of people who run physical activity sessions.

What action should they take?

- Establish a programme of continuous professional development (CPD) for people involved in organising and running physical activity programmes. It should ensure they can:
 - give children and young people information and advice on physical activity, taking into account their developmental age
 - give children and young people confidence in their own abilities and motivate them to be physically active (including encouraging them to set goals, where appropriate)
 - understand the practical issues and problems that may discourage families or groups of young people from getting

involved (for example, time constraints, accessibility and the cultural appropriateness of activities)

- develop and foster partnership working and know how to get the local community involved.

- Train people to deliver physical activity CPD programmes.

Recommendation 9

Who is the target population?

Children and young people aged 4 to 18 who attend school or other education institutions.

Who should take action?

- Public, voluntary, community and private-sector organisations involved in designing physical activity projects and programmes.
- School governors and head teachers.

What action should they take?

- Identify education institutions willing to deliver multi-component physical activity programmes involving school, family and community-based activities. Identify community members, groups and organisations, and private sector organisations willing to contribute and encourage the families of children and young people to become actively involved.
- Develop multi-component physical activity programmes. These should include:
 - education and counselling to increase awareness of the benefits of physical activity and give children and young people the confidence and motivation to get involved
 - policy and environmental changes, such as creating a more supportive environment and new opportunities for physical activity during breaks and after school

- family components, such as homework activities which children and parents do together, education on creating a supportive home environment (for example, by providing transport to locations where children can be active or doing an activity with their child) and school-based family activity days
- community components, such as raising awareness of community-based opportunities for physical activity.

Recommendation 10

Who is the target population?

Children aged up to 11.

Who should take action?

Public, voluntary, community and private-sector managers and decision-makers responsible for – or able to influence – opportunities for children to be physically active including:

- Early years providers and carers of young children including nursery and playgroup (crèche) providers.
- School governors, head teachers and teachers.

What action should they take?

- Ensure opportunities, facilities and equipment are available to encourage children to develop motor skills, such as running, skipping, hopping and climbing or throwing, catching and kicking a ball. For children under 5, activities should be based on the early years foundation stage principles. Older children should be introduced to more complex skills by qualified individuals in a variety of settings, based on the primary school national curriculum for physical education.
- Ensure children have the opportunity to explore a range of physical activities to help them identify those they can enjoy by themselves and those they can do with friends and family. Provide daily opportunities for

- Ensure opportunities are available at weekends and after school. Activities should be led by appropriately trained and qualified staff (paid or voluntary) and take place in schools and other community settings.

Recommendation 11

Who is the target population?

Children and young people aged 18 and under who travel to school or to a pre-school or early years facility, or to out-of-school activities within the local community.

Who should take action?

School governors and head teachers and those involved in governing or leading pre-school and early years education.

What action should they take?

- Encourage a culture of active travel (travel involving physical activity, such as walking or cycling).
- Encourage children and young people, especially those who live within a 1-mile radius of the destination to use active travel.
- Work with local authorities to map safe routes to school and to local community play and leisure facilities, using input from pupils, parents and carers, and in consultation with local communities.
- Develop a school travel plan in line with existing guidance². It should be integrated with the travel plans of other local schools, so that children are

² Teachernet: www.teachernet.gov.uk/wholeschool/sd/managers/travel/STAtoolkit/stp/

encouraged to choose the active travel option throughout their school career.

- Involve children and young people, parents and carers, the local community and external agencies in implementing the school travel plan. Use a mix of measures to promote it (for example, walking buses, walk-and bike-to-school days). Work with the local authority school travel plan adviser to recruit volunteers on a long-term basis to help implement it.
- Set performance targets for school travel plans which are audited annually and which form part of delivery plans for local strategic partnerships. Remedial action should be taken when agreed targets are not reached.

Local practitioners

Recommendation 12

Who is the target population?

Children aged up to 11.

Who should take action?

- Early years providers such as playgroup (crèche) leaders and child minders.
- Teachers and school support staff.
- Local deliverers of physical activity opportunities in the voluntary, community and private sectors.
- Parents and carers.

What action should they take?

- Provide a range of indoor and outdoor physical activities for children on a daily basis. Activities should be tailored according to developmental age

and should be inclusive, progressive and enjoyable. They should develop children's motor skills (from crawling, running, skipping, hopping, climbing or throwing, catching and kicking a ball to more advanced activities such as cycling, playing football and dancing). Give guidance and support to make these both enjoyable and developmental.

- Provide opportunities for physical activity at intervals throughout the day in pre-school establishments; during playtimes and lunch breaks at school; as part of extra-curricular, after-school club and extended school provision; and during leisure time (including weekends and holidays) in wider community settings and the private sector.
- Provide children with equipment and access to environments that stimulate their need to explore and which safely challenge them (such as adventure playgrounds, parks, woodland or common land).
- Help children identify which activities they can enjoy by themselves and with their friends.

Recommendation 13

Who is the target population?

Girls and young women aged 11–18.

Who should take action?

Practitioners responsible for physical activity opportunities in the public, voluntary, community and private sectors.

What action should they take?

- Consult with girls and young women to find out what type of physical activities they prefer. Provide a range of options in response. This may include formal and informal events and non-competitive activities such as dance, aerobics and the gym. It may also include single and mixed-gender group activities.

- Offer school-based interventions outside physical education lessons to encourage physical activity. This should include advice on self-monitoring techniques, stage-matched feedback and counselling. It should also include teacher-led extra-curricula physical activities.
- Address any psychological, social and environmental barriers to physical activity. For example, provide opportunities in easily accessible community settings with appropriate changing facilities offering privacy. Any dress policy should be practical, affordable and acceptable to participants without compromising their safety or restricting participation.

Recommendation 14

Who is the target population?

Girls and young women aged 11–18.

Who should take action?

Practitioners who lead physical activities, including youth leaders, teachers, coaches and volunteers.

What action should they take?

Ensure all physical activity opportunities emphasise participation, enjoyment and personal development. Support participants of all abilities in a non-judgemental way which is sensitive to cultural and religious issues. Encourage those who initially choose not to participate in physical activities to watch. Help them move gradually from observation to full participation.

Recommendation 15

Who is the target population?

Children and young people aged 18 and under, their families and carers.

Who should take action?

Professionals and practitioners who have an opportunity to provide parents, carers and their children with advice on physical activity.

What action should they take?

- Ensure parents and carers are aware of government advice that children should undertake a minimum of 60 minutes moderate-to-vigorous physical activity a day.
- Provide information and advice on the benefits of physical activity, emphasising how enjoyable it is. Provide examples of local opportunities.
- Encourage parents and carers to get involved in physical activities with their children. This may involve anything from providing help with travel or acting as a referee to active participation.
- Act as a role model by incorporating physical activity into daily life. For example, opt for active travel (travel involving physical activity such as walking or cycling), use the stairs and regularly participate in recreational activities or sport.

Recommendation 16***Who is the target population?***

Children and young people aged 18 and under, their families and carers.

Who should take action?

Groups and individuals who have regular contact with children and their parents including: local authority personnel, physical activity professionals, health practitioners and volunteers and staff from community organisations.

What action should they take?

Establish active travel (travel involving physical activity, such as walking or cycling) as a life-long habit, by:

- Promoting it as a family activity and raising awareness of how it can help children and young people achieve the recommended daily amount of daily physical activity.

- Developing parents' and carers' awareness of its wider benefits. For example, by detailing how active forms of travel can help improve children's motor skills, social wellbeing, self-confidence and independence. It's also worth pointing out that it can help children to explore, become familiar and at ease with, and use the environment in ways which increase their physical activity.
- Encouraging parents and carers to walk with young children for some part of local journeys on most days of the week.
- Encouraging (and helping) parents and carers to allow their children to gradually make more journeys independently using an active form of travel.

5 Implementation

NICE guidance can help:

- NHS organisations meet DH standards for public health as set out in the seventh domain of 'Standards for better health' (updated in 2006). Performance against these standards is assessed by the Healthcare Commission, and forms part of the annual health check score awarded to local healthcare organisations.
- NHS organisations, social care and children's services meet the requirements of the DH's 'Operating framework for 2008/09' and 'Operational plans 2008/09–2010/11'.
- NHS organisations, social care and children's services meet the requirements of the Department of Communities and Local Government's 'The new performance framework for local authorities and local authority partnerships'.
- National and local organisations within the public sector meet government indicators and targets to improve health and reduce health inequalities.
- Local authorities fulfil their remit to promote the economic, social and environmental wellbeing of communities.
- Local NHS organisations, local authorities and other local public sector partners benefit from any identified cost savings, disinvestment opportunities or opportunities for re-directing resources.
- Provide a focus for children's trusts, health and wellbeing partnerships and other multi-sector partnerships working on health within a local strategic partnership.
- Support schools in meeting their duty to promote wellbeing and in aiming for healthy school status.

NICE will develop tools to help organisations implement this guidance. Details of the tools will be available on our website after the guidance has issued (www.nice.org.uk/PHxxx).

6 Recommendations for research

This section will be completed in the final guidance. More detail on the evidence gaps identified during the development of this guidance is provided in appendix D.

7 Updating the recommendations

This section will be completed in the final guidance.

8 Related NICE guidance

Promoting and creating built or natural environments that encourage and support physical activity. NICE public health guidance 8 (2008). Available from: www.nice.org.uk/PH008

Promoting children's social and emotional wellbeing in primary education. NICE public health guidance 12 (2008). Available from: www.nice.org.uk/PH012

Workplace health promotion: how to encourage employees to be physically active (2008). NICE public health guidance 13. Available from www.nice.org.uk/PH013

Behaviour change at population, community and individual levels. NICE public health guidance 6 (2007). Available from www.nice.org.uk/PH006

Four commonly used methods to increase physical activity: brief interventions in primary care, exercise referral schemes, pedometers and community-based exercise programmes for walking and cycling. NICE public health guidance 2 (2006). Available from: www.nice.org.uk/PHI002

Obesity: guidance on the prevention, identification, assessment and management of overweight and obesity in adults and children. NICE clinical guideline 43 (2006). Available from: www.nice.org.uk/CG043

Depression in children and young people: identification and management in primary, community and secondary care. NICE clinical guideline 28 (2005). Available from: www.nice.org.uk/CG028

9 Glossary

Access

The ability to use a facility, for instance due to cost, mobility issues, suitability of environment, distance to destination. Examples of facilities include playgrounds, parks or open spaces and leisure centres.

Active play

The Children's Play Council defines play as: '...freely chosen, personally directed, intrinsically motivated behaviour that actively engages the child...' (National Playing Fields Association 2000). Active play involves physical activity.

Curriculum

Lessons delivered by teachers as part of the core school day, such as physical education (PE), personal health and social education (PSHE) and science. Anything else that takes place in a school but outside lessons is extra-curricular. (For example, lunch time sessions, peer education, school policy development, health promotion and other 'co-curricular' activities delivered during or after school hours.)

Motor skills

A motor skill requires use of the skeletal muscles in a goal-directed manner. Motor skills are learnt and refined throughout life. Gross motor skills include: rolling over, sitting up, crawling, walking, running and jumping. Fine motor skills include the ability to manipulate small objects, transfer objects from hand to hand and hand-eye coordination.

Pedometer

A portable electronic device, usually worn on a belt, that counts the steps a person makes.

School travel plan

A written document detailing a package of measures to improve safety and reduce car use, backed by a partnership involving the school, education and

local authority transport officers, the police and the health authority. It is based on consultation with teachers, parents, pupils and governors and other local people. It must include: information about the school, a description and analysis of journeys made and the associated problems, a survey of pupils' current and preferred mode of travel, consultation findings, clearly defined targets and objectives, details of proposed measures and a timetable for implementation, clearly defined responsibilities and proposals for monitoring and review.

Sedentary lifestyle

The Health Survey for England (2005) defines children as sedentary if they either do no physical activity at all or less than 30 minutes a day of moderate intensity activity.

Sport

"Sport" means all forms of physical activity which, through casual or organised participation, aim at expressing or improving physical fitness and mental well-being, forming social relationships or obtaining results in competition at all levels' (Revised European sports charter 2001).

www.sportdevelopment.org.uk/European_sports_charter_revised_.pdf

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Appendix A: membership of the Programme Development Group, the NICE Project Team and external contractors

The Programme Development Group

PDG membership is multidisciplinary. It comprises researchers, practitioners, stakeholder representatives and members of the public as follows:

Gordon Andrews Physical Activity Strategic Lead, Sandwell Primary Care Trust (PCT)

Vicki Birchwood Director of Sport, Salford City Academy, Manchester

Barry Causer Active Travel Service Manager, Sutton and Merton PCT (on secondment from London Borough of Southwark, where he is Sport and Physical Activity Manager)

Issy Cole-Hamilton Policy and Research Manager, Play England at the National Children's Bureau, London

Ashley Cooper Reader in Exercise and Health, Department of Exercise, Nutrition and Health Sciences within the Centre for Sport, Exercise and Health, University of Bristol

Peter Cooper Children's Work Director, YMCA Fairthorne Group, Southampton

Dr Lindsey Dugdill Reader in Exercise and Health and Associate Dean (research) Faculty of Health and Social Care, University of Salford

Martin Hagger Reader in Social Health and Psychology, School of Psychology, University of Nottingham

John Hutton Professor of Health Economics, York Health Economics Consortium and the Department of Health Sciences, University of York

Professor Christopher Laws Visiting Professor of Education, University of Worcester (and Former Head of School of Physical Education University of Chichester)

Patricia Maude Tutor, Homerton College, University of Cambridge

Suzanne Priest Dance Adviser and Advanced Skills Teacher in Dance, National Dance Teachers Association

John Stevens Chief Executive Officer, Active Gloucestershire, University of Gloucestershire

Gareth Stratton (Chair) Professor of Paediatric Exercise Science, Research Institute for Sports and Exercise Sciences, Liverpool John Moores University

Paul Trueman Director, York Health Economics Consortium, University of York

Malcolm Tungatt Policy Manager, Policy and Improvement Team, Sport England

Kim Twine Community Member

Dr Esther van Sluijs Investigator Scientist, Prevention Group, MRC Epidemiology Unit, Cambridge

Sarah Vaughan-Roberts Community Member

Jonathan Williams Chief Executive Officer and Company Exercise Scientist, SHOKK Limited, Manchester

Cooptees

Catherine Rawas former Communications Manager, Walk21, Gloucestershire

NICE Project Team

Mike Kelly

CPHE Director

Simon Ellis

Associate Director

Hilary Chatterton

Lead Analyst

Anthony Threlfall

Analyst

Hugo Crombie

Analyst

Adrienne Cullum

Analyst

Susan Murray

Analyst

Bhash Naidoo

Technical Adviser/Health Economics Adviser.

External contractors

External reviewers: reviews

Review 1: 'Descriptive epidemiology' was carried out by the NICE Public Health Collaborating Centre for Physical Activity. The principal authors were: Stuart Biddle and Nick Cavill.

Review 2: 'Correlates of physical activity in children: a review of quantitative systematic reviews' was carried out by the NICE Public Health Collaborating Centre for Physical Activity. The principal authors were: Stuart Biddle, Andy Atkin and Natalie Pearson.

Review 3: 'The views of children on the barriers and facilitators to participation in physical activity: a review of qualitative studies' was carried out by the NICE Public Health Collaborating Centre for Physical Activity. The principal authors were: Charlie Foster, Gill Cowburn, Steve Allender and Nicola Pearce Smith.

Review 4: 'Intervention review: under eights' was carried out by the NICE Public Health Collaborating Centre for Physical Activity. The principal authors were: Trish Gorely, Andy Atkins and Charlie Foster.

Review 5: 'Intervention review: children and active travel' was carried out by the NICE Public Health Collaborating Centre for Physical Activity. The principal authors were: Adrian Davis, Ashur Kaur, Nick Cavill and Charlie Foster with assistance from the SURE Information Centre, University of Cardiff.

Review 6: 'Intervention review: adolescent girls' was carried out by the NICE Public Health Collaborating Centre for Physical Activity. The principal authors were: Stuart Biddle, Andrew Atkin, Trish Gorley, Nick Cavill and Charlie Foster.

Review 7: 'Intervention review: family and community' was carried out by the NICE Public Health Collaborating Centre for Physical Activity. The principal authors were: Trish Gorley, Stuart Biddle, Andrew Atkin, Nick Cavill and Charlie Foster.

Review 8: 'Review of learning from practice: children and active play' was carried out by the NICE Public Health Collaborating Centre for Physical Activity. The principal authors were: Nick Cavill and Charlie Foster.

External reviewers: economic appraisal

Review of economic evaluations: 'A rapid review of economic literature related to the promotion of physical activity, play and sport for pre-school and school age children in family, pre-school, school and community settings' was carried out by the Health Economics Research Centre, Oxford. The principal authors were: James Buchanan, Jane Wolstenholme and Charlie Foster.

Cost effectiveness analysis: 'A cost-effectiveness scenario analysis of four interventions to increase child and adolescent physical activity: the case of walking buses, free swimming, dance classes and community sports' was carried out by the Health Economics Group, School of Medicine, Health Policy

and Practice University of East Anglia. The principal authors were: Richard Fordham and Garry Barton.

Appendix B: summary of the methods used to develop this guidance

Introduction

The reports of the reviews and economic appraisal include full details of the methods used to select the evidence (including search strategies), assess its quality and summarise it. The minutes of the PDG meetings provide further detail about the Group's interpretation of the evidence and development of the recommendations.

All supporting documents are listed in appendix E and are available from the NICE website at: www.nice.org.uk/guidance/index.jsp?action=byID&o=11672

The guidance development process

The stages of the guidance development process are outlined in the box below.

1. Draft scope
2. Stakeholder meeting
3. Stakeholder comments
4. Final scope and responses published on website
5. Reviews and cost-effectiveness modelling
6. Synopsis report of the evidence (executive summaries and evidence tables) circulated to stakeholders for comment
7. Comments and additional material submitted by stakeholders
8. Review of additional material submitted by stakeholders (screened against inclusion criteria used in reviews)
9. Synopsis, full reviews, supplementary reviews and economic modelling submitted to the PDG
10. The PDG produces draft recommendations
11. Draft recommendations published on website for comment by stakeholders and for field testing
12. The PDG amends recommendations
13. Responses to comments published on website
14. Final guidance published on website

Key questions

The key questions were established as part of the scope. They formed the starting point for the reviews of evidence and facilitated the development of recommendations by the PDG. The overarching questions were:

1. Which strategies, policies, campaigns, interventions and approaches are effective and cost effective in helping children of different ages (with low levels of physical activity) to become more physically active?
2. What are the barriers and facilitators to children's participation in physical activity?
3. Which physical activity strategies, policies, campaigns, interventions and approaches are effective and cost effective in reducing health inequalities among pre-school and school-age children?

These questions were refined further in relation to the topic of each review (see reviews for further details).

Reviewing the evidence

A total of 8 reviews were conducted.

Identifying the evidence

Searches were conducted for studies published from January 1990 to April 2007 (except where stated).

The following databases were searched for reviews 2, 4, 5, 6, and 7.

Additional searches for these reviews and details for the other reviews are listed separately.

- Applied Social Sciences Index and Abstracts
- ArticleFirst
- Cambridge Scientific Abstract
- CINAHL
- Cochrane Library
- CSA Environmental Sciences

- EMBASE
- ERIC
- Geobase
- Global Health
- ISI Social Science Citation Index
- MEDLINE
- PubMed
- PsycINFO
- Science Citation Index
- SIGLE
- Sociological Abstracts
- SPORTDiscus
- TRIS online
- Web of Science.

Review 1: 'Descriptive epidemiology'

The following databases were searched from 2001 for longitudinal or cohort studies:

- MEDLINE
- Metalib (including ArticleFirst, Physical Education Index, PSYCinfo, SPORTDiscus, Web of Science, Zetoc)
- PubMed.

Web searches were also conducted: a key source was a briefing paper on obesity produced by the NHS.

Review 2: 'Correlates of physical activity in children: a review of quantitative systematic reviews'

In addition to searching the main databases from 2000 to April 2007, manual searches were conducted of the following key peer-reviewed journals:

- 'International journal of behavioural nutrition and physical activity'
- 'Journal of physical activity & health'

- 'Obesity reviews'
- 'Pediatric exercise science'
- 'Preventive medicine'
- 'Sports medicine'.

Primary research articles, reviews and book chapters, as well as research team members' files were also searched. In addition, the websites of four UK and US organisations involved in commissioning, undertaking or cataloguing research on physical activity and young people were searched for 'grey' literature. These were:

- Play England: www.playengland.org.uk/Page.asp
- Sustrans: www.sustrans.org.uk/
- Active Living Research (US): www.activelivingresearch.org
- Institute of Education, University of London: <http://eppi.ioe.ac.uk/cms/>

Review 3: 'The views of children on the barriers and facilitators to participation in physical activity: a review of qualitative studies'

The following databases were searched to identify non-intervention qualitative studies published since 1990:

- CINAHL
- CSA Environmental Sciences
- EMBASE
- Environmental Sciences and Pollution Management
- ERIC
- Index to Thesis
- PsycINFO
- Science Citation Index and SSCI
- SIGLE (ends 2005)
- SPORTDiscus
- TRIS online.

In addition, the websites of four UK and US organisations involved in commissioning, undertaking or cataloguing research on physical activity and young people were searched for 'grey' literature. These were:

- Play England: www.playengland.org.uk/Page.asp
- Sustrans: www.sustrans.org.uk/
- Active Living Research (US): www.activelivingresearch.org
- Institute of Education, University of London: <http://eppi.ioe.ac.uk/cms/>

Reviews 4, 5, 6 and 7: 'Under eights', 'Children and active travel', 'Adolescent girls', and 'Family and community'

In addition to the main database search, the following were also searched:

- Environline
- EPPI Centre Databases
- HMIC
- NRR
- TRANSPORT
- The 'Journal of physical activity and health'.

Review 8: 'Review of learning from practice: children and active play'

Two PDG members helped to identify a list of relevant references, based on an iterative search of material in the National Play Library. This was supplemented by web searches and re-interrogation of the search results from the other reviews. References were screened for relevance by two reviewers.

Selection criteria

Inclusion and exclusion criteria for each review varied and details can be found at www.nice.org.uk/guidance/index.jsp?action=byID&o=11672.

However, in general studies were included as follows.

- Review 1: Studies conducted in England or the UK (as long as they included England) that questioned children and young people on physical activity in childhood and adulthood.

- Review 2: Studies classified as review papers and using systematic methodologies, if they looked at the association between quantitatively measured variables and children or adolescents' (<19 years old) physical activity.
- Review 3: Studies which explored children's, adolescents' (<18 years old) or carers' experiences of sport, play and active travel. Methods and results had to be clearly reported and the study had to be relevant to the UK.
- Reviews 4, 5, 6 and 7: Intervention studies on children under eight, active travel, adolescent girls, and family and communities, if they reported on physical activity or physical skills. See the reviews for further details.
- Review 8: Material directly applicable to the UK. It was not limited by quality or study design, but needed to illustrate or describe the opinions and experiences of children, parents and practitioners about how to stimulate – or help stimulate – active play.

Studies were excluded if:

- they focused on treating obesity
- they were from less economically developed countries
- they were studies about ethnic groups that do not have large populations in England
- the intervention involved the school curriculum/physical education
- the study involved a change to the built or natural environment.

Quality appraisal

For reviews 3–7, included papers were assessed for methodological rigour and quality using the NICE methodology checklist, as set out in the NICE technical manual 'Methods for development of NICE public health guidance' (see appendix E). Each study was described by study type and graded (++, +, -) to reflect the risk of potential bias arising from its design and execution.

Study type

- Meta-analyses, systematic reviews of randomised controlled trials (RCTs) or RCTs (including cluster RCTs).
- Systematic reviews of, or individual, non-randomised controlled trials, case-control studies, cohort studies, controlled before-and-after (CBA) studies, interrupted time series (ITS) studies, correlation studies.
- Non-analytical studies (for example, case reports, case series).
- Expert opinion, formal consensus.

Study quality

- ++ All or most of the criteria have been fulfilled. Where they have not been fulfilled the conclusions are thought very unlikely to alter.
- + Some criteria have been fulfilled. Those criteria that have not been fulfilled or not adequately described are thought unlikely to alter the conclusions.
- Few or no criteria fulfilled. The conclusions of the study are thought likely or very likely to alter.

The studies were also assessed for their applicability to the UK.

Summarising the evidence and making evidence statements

The review data was summarised in evidence tables (see full reviews).

The findings from the included papers in each review were synthesised and used as the basis for a number of evidence statements relating to each review question. The evidence statements reflect the strength (quantity, type and quality) of evidence and its applicability to the populations and settings in the scope.

Economic analysis

The economic appraisal consisted of a review of economic evaluations and a cost-effectiveness analysis.

Review of economic evaluations: 'A rapid review of economic literature related to the promotion of physical activity, play and sport for pre-school and school age children in family, pre-school, school and community settings'

The following databases were searched for economic literature that had not been identified through the search of the effectiveness reviews:

- EconLIT
- Health Economic Evaluation Database (HEED)
- NHS Economic Evaluation Database (NHS EED).

Relevant websites were searched (for example, Sport England www.sportengland.org and Department for Transport www.dft.gov.uk). Other sources included papers identified from the personal libraries or collections of members of the health economics team.

Studies were included if they were:

- based in economically developed countries and considered the promotion of physical activity, play and sport for children
- economic evaluations or contained cost, resource use or outcomes data which could be used to inform the economic modelling.

Cost-effectiveness analysis: 'A cost-effectiveness scenario analysis of four interventions to increase child and adolescent physical activity: the case of walking buses, free swimming, dance classes and community sports'

An economic model was constructed to incorporate data from the reviews of effectiveness (reviews 4,5,6,7) and cost effectiveness.

Both reports are available on the NICE website at:

www.nice.org.uk/guidance/index.jsp?action=byID&o=11672

Fieldwork

This section will be completed in the final document.

How the PDG formulated the recommendations

At its meetings in 2007/2008, the PDG considered the evidence to determine:

- whether there was sufficient evidence (in terms of quantity, quality and applicability) to form a judgement
- whether, on balance, the evidence demonstrates that the intervention is effective or ineffective, or whether it is equivocal
- where there is an effect, the typical size of effect.

The PDG developed draft recommendations through informal consensus, based on the following criteria:

- Strength (quality and quantity) of evidence of effectiveness and its applicability to the populations/settings referred to in the scope.
- Effect size and potential impact on population health and/or reducing inequalities in health.
- Cost effectiveness (for the NHS and other public sector organisations).
- Balance of risks and benefits.
- Ease of implementation and the anticipated extent of change in practice that would be required.

The PDG also considered whether a recommendation should only be implemented as part of a research programme where evidence was lacking.

Where possible, recommendations were linked to an evidence statement(s) (see appendix C for details). Where a recommendation was inferred from the evidence, this was indicated by the reference 'IDE' (inference derived from the evidence).

Appendix C: the evidence

This appendix sets out the evidence statements taken from eight reviews and links them to the relevant recommendations (see appendix B for the key to study types and quality assessments). The evidence statements are presented here without references – these can be found in the full review (see appendix E for details). It also sets out a brief summary of findings from the economic appraisal.

The eight reviews are:

- Review 1: 'Descriptive epidemiology'
- Review 2: 'Correlates of physical activity in children: a review of quantitative systematic reviews'
- Review 3: 'The views of children on the barriers and facilitators to participation in physical activity: a review of qualitative studies'
- Review 4: 'Intervention review: under eights'
- Review 5: 'Intervention review: children and active travel'
- Review 6: 'Intervention review: adolescent girls'
- Review 7: 'Intervention review: family and community'
- Review 8: 'Review of learning from practice: children and active play'.

Evidence statement number 2.4 indicates that the linked statement is numbered 4 in review 2 'Correlates of physical activity in children: a review of quantitative systematic reviews'. **Evidence statement 4.1** indicates that the linked statement is numbered 1 in review 4 'Intervention review: under eights'.

The reviews and the economic appraisal are available on the NICE website (www.nice.org.uk/guidance/index.jsp?action=byID&o=11672). Where a recommendation is not directly taken from the evidence statements, but is

inferred from the evidence, this is indicated by **IDE** (inference derived from the evidence).

Recommendation 1: evidence statements 2.4, 3.1, 3.2, 3.3, 3.4, 7.1b, 7.6

Recommendation 2: evidence statements 3.1, 3.2, 7.5

Recommendation 3: evidence statements 3.1, 3.4

Recommendation 4: evidence statements 2.5, 8.1

Recommendation 5: evidence statements 5.1, 5.2, 5.3

Recommendation 6: evidence statements 3.1, 3.2, 3.4

Recommendation 7: evidence statement 3.2

Recommendation 8: evidence statements 3.1, 8.1

Recommendation 9: evidence statement 7.5

Recommendation 10: evidence statements 2.4, 3.2, 4.3, 8.4

Recommendation 11: evidence statements 3.3, 5.1, 5.2, 5.3, 5.4

Recommendation 12: evidence statements 3.2, 4.3

Recommendation 13: evidence statement 3.1

Recommendation 14: evidence statements 3.1, 6.1

Recommendation 15: evidence statements 2.4, 3.2, 7.1a, 7.5, 8.5

Recommendation 16: evidence statements 3.3, 5.1, 5.2, 5.3, 5.4

Evidence statements

Evidence statement 2.4

There is evidence from four systematic reviews of observational studies that: there is a large positive association between parental and social support and physical activity in young people.

Evidence statement 2.5

There is evidence from four systematic reviews of observational studies that there is a:

- small-to-moderate positive association between access to facilities and participation in physical activity in young people
- moderate negative association between distance from home to school and physical activity in young people
- moderate-to-strong positive association between time spent outside and physical activity in young people
- small negative association between local crime and physical activity in young people.

Evidence statement 3.1

There is evidence from 15 UK qualitative studies of adolescent girls (reported in 16 papers) (two [++]; six [+] and eight [-]) that the main barriers to being physically active were:

- social pressure to conform, (for example, wanting to fit in)
- negative experience of the school environment (for example, inappropriate school PE kit and discomfort about sharing showers, changing rooms)
- negative experiences of sports facilities (for example, public spaces such as gyms or exercise classes were intimidating to teenage girls)
- having to perform in public (for example, being forced to perform a skill in front of peers)
- fear of forced competition (one study [++]reported that creating a supportive environment for the delivery of a curricula focused on

participation rather than competition and empowering students led to non-active student becoming more active)

- fear of sexual or racial harassment (for example, Asian girls described needing escorting by family member to places to participate in sports).

The main facilitators to being physically active were:

- social and family influences (for example, social sanctioning of activities by peers provided opportunities to gain social standing and was likely to encourage continued or increased participation; having active siblings and supportive parents)
- enjoyment (for example, enjoyment and fun during sport and physical activity; enjoyment might outweigh the impact of negative peer pressure not to participate)
- socialisation (for example, sport provides the opportunity to socialise with friends and extend friendship networks beyond school)
- intrinsic and extrinsic rewards (for example, wanting to participate in sport as a means to achieve a socially desirable body type; receiving praise and encouragement from PE teachers helped with self confidence and a positive self identity).

Evidence statement 3.2

There is evidence from five UK qualitative studies of children aged 8 and under (three [+] and two [-]) that: there were far fewer barriers to physical activity and sport compared to other age groups. Barriers were:

- dislike of a focus on team sports (for example, team sport focus in primary schools)
- gender and cultural stereotyping about appropriateness of some sports for particular genders by parents and peers for example, parent viewing boys more active than girls; some sports were more 'appropriate' for boys to play than girls; boys not allowing girls to play 'boys games')
- costs of participation in organised sports (for example, cost in terms of time and money in participating)

- dislike of physical activities becoming less fun and more technical and performance-orientated (for example, girls stopped participating in ballet as it became more technical and less fun-orientated).

The main facilitators for children aged 8 and under were:

- enjoyment (for example, creative and fun activities; participating in their favourite sports or activities; older children involving younger children)
- parental and peer support (for example, physical activity was healthy; girls and boys enjoyed playing sports more if they had started at a younger age)
- participation in age appropriate activities (for example, fun-based dance activities at younger ages; parent seeing a progression from fun to more structured activity as children became older).

Evidence statement 3.3

There is evidence from three UK qualitative studies of children and active travel that the main barriers to active travel were:

- children and parents' fear of traffic (for example, children feeling unsafe when playing and walking outside, particularly after school)
- parental restrictions on independent movement (for example, parental restrictions on a child's range [distance], plus place and destinations)
- school influence over cycling policy and storage facilities (for example, absence of any school provision of facilities reflecting a lack of support for cycling)
- limited play destinations locally (for example, too far to travel to independently; access dangers due to traffic; play equipment unsuitable)
- adult disapproval of children playing outside (for example, children told off for cycling or playing in streets by adults).

Only one study reported any facilitators for walking and cycling. These included:

- providing personal freedom (for example, reported that walking and cycling increased their personal freedom and independence)

- enjoyment and fun with friends (for example, older children enjoyed walking to school because they could mix with their friends)
- the opportunity to explore local surroundings (for example, gave them the chance to explore local neighbourhoods with their friends and/or alone).

Evidence statement 3.4

There is evidence from two UK studies and two international qualitative studies (both Australian), of families and community that barriers to physical activity and sport were related to personal safety of children while playing outside unsupervised. Common issues were:

- perceived stranger danger (for example, both parents and children independently reported fear of strangers)
- risk of personal accidents (for example, both parents and children independently reported risk of accidents or getting hurt)
- intimidation from older children (for example, both parents and children independently reported the risk of intimidation or bullying by older children; fear of rival gangs for different areas)
- poor quality of places to play (for example, presence of drug taking equipment (like syringes) in play areas; poorly maintained toilets, shaded areas and lighting).

Facilitators were that children:

- valued opportunities for independent outdoor play (for example, the chance to play away from adult supervision with friends; parents preferring these places for independent play to be courtyards or cul-de-sacs rather than through roads)
- preferred activities that emphasised fun, play and enjoyment rather than skills practice (for example, older children attending athletics club liked playing with friends).

Evidence statement 4.3

There is evidence from one cluster randomised controlled trial in the UK (+), one controlled non-randomised trial in Greece (+) and one controlled before-

and-after trial in the USA (-) that supervised physical activity interventions conducted in the pre-school setting can be effective in improving core physical skills such as: running, galloping, hopping, sliding, leaping, skipping and general motor agility.

Evidence statement 5.1

There is evidence from five UK studies (all uncontrolled before-and-after studies [+]) that cycling promotion projects, targeting primary and secondary school children can lead to large self-reported increases in cycling both at 9–11 months and over 20–23 months. Characteristics of successful interventions included the involvement of external agencies to facilitate schools to promote and maintain cycling, with the support of parents and the local community.

There is evidence from two studies (uncontrolled before-and-after studies [+]), where cycling infrastructure was commonly part of the local transport infrastructure or children were encouraged to cycle to curriculum-related events or sports fixtures, that self-reported levels of walking declined over 20 and 23 months, implying that some of the increase in cycling may have been offset by a decrease in walking. The evidence is applicable to the UK.

Evidence statement 5.2

There is evidence from one UK study (randomised controlled trial [++]) to suggest that the introduction of school travel plans and direct support from a school travel plan adviser at primary schools did not lead to increases in self-reported levels of walking and cycling at 12 months.

There is evidence from one US and one UK study (uncontrolled before-and-after-study [+]) to suggest that a mix of promotional measures including curriculum, parental and community promotions (for example, mapping safe routes to school, walk and bike to school days) can increase self-reported walking and cycling at 24 months. In the UK study, this activity was in support of a travel plan. The evidence is applicable to the UK.

Evidence statement 5.3

There is evidence from three UK studies (uncontrolled before-and-after studies [+]) to suggest that walking buses (volunteer-led walking groups supported by parents and teachers plus the involvement of the local highways or transport authority) led to increases in self-reported walking among 5–11 year olds, and reduced car use for children's' journeys to and from school at 10 weeks and 14 to 30 months.

There is evidence from one study (uncontrolled before-and-after study [-]) to suggest that the provision of a walking bus may in itself not be sufficient to stem a more general decline in walking to and from school. Retaining volunteers to act as coordinators for these schemes appears to be a key factor in the sustainability of walking buses.

Currently walking buses are found to be commonly delivered in the UK, however evidence for their applicability remains uncertain (as they may be applicable only to the specific populations or settings included in the studies).

Evidence statement 5.4

There is evidence from one UK study (controlled before-and-after study [+]), and two UK (uncontrolled before-and-after studies [+]) and one Australian studies (uncontrolled before-and-after study [+])to suggest that walking promotion schemes, involving promotional materials, incentives and rewards (such as travel diaries for children and parents and provision of 'park and walk' parking areas close to school and restriction of parking outside of schools), can lead to increases in self-reported walking to school among 4 to 11 year olds, and reduced car use for children's' journeys to and from school at 4 to 10 weeks and 41 to 48 months.

There is evidence from one UK study (controlled before-and-after study [+]) to suggest that walking campaign packs alone, including promotion materials for children and parents, did not lead to increases in walking among 4 to 11 year olds at 4 weeks.

There is evidence from two UK and one Australia study (uncontrolled before-and-after study [+]) to suggest that targeting children and parents who live a short distance to school (1 mile or less) may support interventions to encourage increase walking levels for the school journey.

The evidence mainly comes from UK studies and so is directly applicable only to populations or settings included in the studies (primary school settings).

The success of broader application is uncertain.

Evidence statement 6.1

There is evidence from three cluster randomised controlled trials (one each in Australia [+], France [+], and Ireland [+]), and one controlled non-randomised trial in the USA (-), that school-based interventions outside of physical education lessons, targeting the single behaviour of physical activity, can lead to moderate-to-large increases in physical activity in adolescent girls for up to 6 months. One randomised controlled trial (++) and one cluster randomised controlled trial (+) (both from the USA), failed to show an effect.

Characteristics of successful interventions were not consistent across studies, although three of the four successful trials targeted girls only. Successful interventions included self-monitoring techniques, stage-matched counselling, teacher-led extra-curricula physical activity, and multi-level programming targeting psychological, social and environmental correlates.

The evidence is drawn from non-UK studies and therefore the applicability to the UK is limited.

Evidence statement 7.1a

There is evidence from two randomised controlled trials in the USA (one [++] and one [+]) that family-based physical activity interventions targeting overweight/obese children and/or those at risk for overweight/obesity, can lead to increases in physical activity in young people. However, two randomised controlled trials in the USA (both [+]) failed to show an effect in the same target group. Characteristics of successful interventions included being located in the home and therefore not involving attendance at external

sites and focused on small, specific lifestyle changes (2000 more steps per day and a single dietary target). In contrast, unsuccessful interventions required regular attendance at sites external to the home for education and/or physical activity sessions, broader physical activity and dietary behaviour change, and were with 8–9 year old African-American girls.

Evidence statement 7.1b

There is evidence from one randomised controlled trial in the USA (+), one randomised non-controlled trial in the USA (+), one controlled non-randomised trial (+) and one uncontrolled before-and-after study (-) that family-based interventions, targeting physical activity, can lead to increases in physical activity in young people. One randomised controlled trial in the USA (++) and one uncontrolled before-and-after study in the USA (-) failed to show an effect. One randomised controlled trial in the USA (-) showed a negative effect. Successful interventions were located mostly in the home and predominantly involved information packs. Two of the successful interventions involved either mothers and daughters or grandmothers, mothers, and daughters exercising together. Unsuccessful interventions all involved regular attendance at physical activity and education sessions outside of the home. Other differences between successful and unsuccessful interventions were not consistent.

Evidence statement 7.5

There is evidence from two cluster randomised controlled trials in Belgium and France (both [+]) and three controlled non-randomised trials in the Netherlands, Greece and the USA (one [+] and two [-]) that interventions involving both the school and family and/or community agencies lead to positive changes in physical activity in boys and girls aged 13 or under. These positive outcomes may include an actual increase in physical activity or less of a decline in physical activity relative to controls. Successful interventions had multiple components. At the school level this included computer-tailored advice, changes to the school environment, classroom sessions, physical activity sessions, and physical education. Family components included facilitating social support for physical activity, education on creating a

supportive home environment, homework activities involving parents, and community sport information. One cluster randomised controlled trial in the USA (+) and one uncontrolled before-and-after study in the USA (-) failed to show an effect. The characteristics of these unsuccessful interventions were not consistently different from those of successful interventions.

Evidence statement 7.6

There is evidence from one controlled non-randomised trial in the USA (+) that social marketing interventions can increase levels of free-time physical activity in children and adolescents (9–15 year olds). The social marketing campaign employed engaging messages (primarily via TV advertisements) and promoted opportunities to incorporate physical activity into daily lives. The sustained nature of the campaign (2 years) was considered important to its success. Behavioural changes were seen in the activities targeted by the campaign (for example, free-time activities) and there were no effects on participation in organised sport.

Evidence statement 8.1

There is strong support for the principle of ensuring that children in the foundation stage are given the opportunity for regular outdoor play as part of the school day. Outdoor play should provide opportunities for movement and challenge, and opportunities to play safely with natural elements.

Children's play in outdoor space can be optimised through a number of practical measures such as: seeing the indoor and outdoor spaces as one environment; providing materials specifically for physically active play; making links to the curriculum; provide for diverse active activities; planning to take account of issues such as weather, light, wind direction.

The indoor environment can also be optimised for active play, through providing sufficient space; allowing freedom to move from one area to another; providing good opportunities for energetic physical movement; dividing space into active and quiet zones.

Adults can help to facilitate active play through: creating the right context for play in which children feel secure and still have the necessary freedom and autonomy to explore through free play; observing play and understanding children's interests, in order to guide the provision of resources and environments for play; interacting appropriately and intervening only when necessary; creating the right environment for play including materials and resources for play, as well as the actual place to play.

Practitioners may limit the amount of outdoor play offered to children due to a number of assumptions: that the outside is dangerous; that higher adult/child ratios are needed outside; that educators are merely supervisors outdoors, and that no learning happens outside; that the weather is a barrier; and that being outside is somehow less healthy. All of these assumptions can be tackled to increase active play outdoors.

There appears to be a strong consensus among practitioners that there should be much more out of hours use of school grounds.

For older children, play facilities are most valued when they are close at hand. If a facility is more than a few hundred metres away, regular use declines dramatically.

Evidence statement 8.4

It is well acknowledged that physical education contributes to the development of core skills. However, there appears to be much less consensus on the role of play in developing core skills.

Core skills can be developed through natural active play, especially when the play is determined by the children themselves.

The role of the play practitioner may be less about planning complex programmes to focus on core skill development, but instead facilitating active play.

Evidence statement 8.5

There is often reluctance by parents and professional carers to also go outside and supervise children playing outdoors in poor weather.

It appears that practitioners are put off by the weather more than children.

There are many examples of ways that this has been tackled, through encouraging children to spend time outside independently or under supervision in all weathers; encouraging parents and carers to allow their children to be outside; and encouraging nursery and teaching staff to spend time outside with children as part of their formal and informal activities.

There is a great deal of experience of a positive approach to bad weather, much of which has been incorporated into the UK Forest Schools movement, building on its origins in Sweden.

Cost-effectiveness evidence

For this guidance the economic appraisal consisted of a review of economic evaluations and a cost-effectiveness analysis.

- 'A rapid review of economic literature related to the promotion of physical activity, play and sport for pre-school and school age children in family, pre-school, school and community settings'.
- 'A cost-effectiveness scenario analysis of four interventions to increase child and adolescent physical activity: the case of walking buses, free swimming, dance classes and community sports'.

Review of economic evaluations

Overall, the rapid review found that there was very limited economic evidence with respect to the promotion of physical activity, play and sport in the four core areas identified. Only two economic evaluations were appraised on the strength of their evidence, both were from the USA and considered interventions to modify the behaviour of obese children, while one study also considered the behaviour of their obese parents. However, these studies were

considered not to be relevant to the development of the guidance due their targeting of only obese children.

Cost-effectiveness analysis

A case study or scenario analysis approach was taken to model four different physical activity programmes and consider the cost effectiveness of each as far as was practical with the available data. The programmes considered were:

- walking buses
- free swimming
- dance classes
- community sports.

The analysis sought to estimate the additional minutes of physical exercise derived from the interventions, and these minutes of exercise per year were used to derive the short-term quality of life improvements for children.

However, there was uncertainty associated with the cost-effectiveness results as, due to the limitations of the evidence, it was necessary to make a number of unverified assumptions within the analyses. The results were also shown to be sensitive to changes in these assumptions.

Only walking buses were estimated to be cost effective. This was assuming a cost-effectiveness threshold of £20,000 per QALY and because of their relatively low cost and that children benefited by being engaged in the activity on a regular basis over time. However, due to the number of assumptions made producing the cost-effectiveness estimates, the PDG was cautious in drawing conclusions.

Appendix D: gaps in the evidence

The PDG identified a number of gaps in the evidence related to the programmes under examination, based on an assessment of the evidence in the various reviews. These gaps are set out below.

1. The qualitative literature mainly focuses on school and sport. There is little evidence on formal or informal activities outside school such as yoga, dance, aerobics and play, or activities in social settings. Provision of non-competitive recreational physical activities has rarely been compared with more traditional school sporting activities (in or outside normal school hours). Comparisons between recreational physical activities organised with groups of friends – or with groups of a similar ability – are also lacking.
2. There is limited evidence about what prevents children and young people from being physically active – or what encourages them. Lack of detail in the descriptions of the interventions means it is unclear whether the barriers or facilitators identified in the qualitative literature were addressed by the interventions examined.
3. There is little evidence about what encourages families to be physically active (either together or split into adult–child groups). There is also little evidence about how families manage competing priorities when planning such activities.
4. Little is known about children and young people's views of active travel and how to promote it to them. The exception relates to journeys to and from school. (Active travel is a mode of transport involving physical activity, such as walking and cycling.)
5. There is little evidence on how to sustain active travel initiatives. For example, little is known about how best to recruit and retain walking bus leaders and local champions, or how effective it is to use pedometers to promote walking among children and young people. In addition, the

effect of the environment on uptake (that is, urban versus rural settings and flat versus hilly terrain) has not been properly considered.

6. The intervention literature has methodological limitations. Descriptions of the interventions and evaluation methods used are limited (which may, to some extent, reflect publishing restrictions). In addition, the quality of implementation is rarely assessed and few studies have long-term follow-up. Often studies do not take potential mediator variables into account and do not use objective measures of overall physical activity when measuring effectiveness.
7. Much of the evidence comes from urban settings and its relevance to children from rural areas needs to be considered.
8. No studies were identified that measured the effectiveness of using rewards to increase participation in – and enjoyment of – organised physical activity.
9. No studies were found which evaluated UK-based, multi-component interventions.
10. Evidence is scarce on how to encourage particular groups of children and young people who are less likely to be physically active. These groups include those with disabilities or with special educational needs, those from certain minority ethnic groups and from traveller and refugee communities.
11. There is a lack of evidence on the effectiveness of private or community-based physical activity provision.
12. There is little evidence of what works to encourage young children to be physically active. For example, the mediating role of parents and practitioners has not been explored and the evidence about whether or not play initiatives encourage pre-school children to be active is contradictory.

13. There is virtually no evidence on the cost-effectiveness of interventions to increase children and young people's physical activity levels. Many studies use weak measurements of effectiveness (as noted above). As a result, the opportunities to use modelling methods to estimate cost-effectiveness were limited.
14. Very few longitudinal studies track the relationship between physical activity and health outcomes. Likewise, there is a dearth of interventions that have been well-evaluated over the longer term.

Appendix E: supporting documents

Supporting documents are available from the NICE website (www.nice.org.uk/guidance/index.jsp?action=byID&o=11672). These include the following.

- Reviews:
 - Review 1: 'Descriptive epidemiology'
 - Review 2: 'Correlates of physical activity in children: a review of quantitative systematic reviews'
 - Review 3: 'The views of children on the barriers and facilitators to participation in physical activity: a review of qualitative studies'
 - Review 4: 'Intervention review: under eights'
 - Review 5: 'Intervention review: children and active travel'
 - Review 6: 'Intervention review: adolescent girls'
 - Review 7: 'Intervention review: family and community'
 - Review 8: 'Review of learning from practice: children and active play'.
- Economic analysis:
 - Review of economic evaluations: 'A rapid review of economic literature related to the promotion of physical activity, play and sport for pre-school and school age children in family, pre-school, school and community settings'
 - Cost-effectiveness analysis: 'A cost effectiveness scenario analysis of four interventions to increase child and adolescent physical activity: the case of walking buses, free swimming, dance classes and community sports'.

For information on how NICE public health guidance is developed, see:

- 'Methods for development of NICE public health guidance' available from: www.nice.org.uk/phmethods

- 'The public health guidance development process: an overview for stakeholders including public health practitioners, policy makers and the public' available from: www.nice.org.uk/phprocess