NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE

PUBLIC HEALTH DRAFT GUIDANCE

Type 2 diabetes: preventing pre-diabetes among adults in high-risk groups

Introduction

The Department of Health (DH) asked the National Institute for Health and Clinical Excellence (NICE) to produce public health guidance on the prevention of type 2 diabetes mellitus among high-risk groups.

The referral was divided into two separate pieces of guidance. The first (this guidance) addresses the prevention of raised or impaired **glucose** levels among communities at greatest risk of developing type 2 **diabetes**. The second publication will focus on preventing the development of type 2 diabetes in individuals with raised or impaired glucose levels. It will define the processes for identifying and monitoring those at high risk and how to provide them with effective one-to-one interventions and other support.

For the purposes of this guidance, the term ‘pre-diabetes’ is used to refer to raised (but not diabetic) levels of blood glucose. Although there is a lack of consensus in the scientific literature about the usefulness of this term, it is frequently used to communicate with patients and the public.

Pre-diabetes and **type 2 diabetes** are points along a continuum of blood glucose levels which may be assessed in a variety of ways. The factors that determine risk are the same for both – and they can both be prevented using the same types of intervention.

Groups at greater risk of developing diabetes include people of South Asian, African-Caribbean, black African and Chinese descent and those from a lower socioeconomic background.

The guidance is for commissioners, managers and practitioners with public health as part of their remit working within the NHS, local authorities, the

national and local public health service and the wider public, private, voluntary and **community** sectors.

It is particularly aimed at: directors of public health, public health commissioners and all those working in national and local public health services. This includes: GPs, practice nurses, dietitians, public health nutritionists, those involved in delivering **physical activity** interventions, community engagement teams and community leaders. It may also be of interest to members of the public.

The guidance complements, but does not replace, NICE guidance on: behaviour change, cardiovascular disease, community engagement, diabetes in pregnancy, management of type 2 diabetes, maternal and child nutrition, obesity, physical activity and weight management before, during and after pregnancy (for further details, see section 7).

The Programme Development Group (PDG) has considered the evidence reviews, evidence of cost effectiveness, commissioned reports and expert testimony.

This document sets out the Group's preliminary recommendations. It does not include all sections that will appear in the final guidance. NICE is now inviting comments from stakeholders (listed on our website at: www.nice.org.uk).

Note that this document does not constitute NICE's formal guidance on type 2 diabetes: preventing pre-diabetes among adults in high-risk groups. The recommendations made in section 1 are provisional and may change after consultation with stakeholders and fieldwork.

The stages NICE will follow after consultation (including fieldwork) are summarised below.

- The Group will meet again to consider the comments, reports and any additional evidence that has been submitted.
- After that meeting, the Group will produce a second draft of the guidance.

- The draft guidance will be signed off by the NICE Guidance Executive.

For further details, see 'The NICE public health guidance development process: An overview for stakeholders including public health practitioners, policy makers and the public (second edition, 2009)' (this document is available at www.nice.org.uk/phprocess).

The key dates are:
Closing date for comments: 19 January 2011
Next PDG meeting: 8 February 2011

Members of the PDG are listed in appendix A and supporting documents used to prepare this document are listed in appendix E.

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

Contents

1 Recommendations

When writing the recommendations, the Programme Development Group (PDG) (see appendix A) considered the evidence reviews, evidence of cost effectiveness, commissioned reports and expert testimony. Note: this document does not constitute NICE'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 PDG considers that the recommended measures are cost effective.

For the gaps in research, see appendix D.

The evidence reviews, supporting evidence statements and economic modelling report are available at http://guidance.nice.org.uk/PHG/Wave19/6

Definitions

Pre-diabetes

For the purposes of this guidance, the term **pre-diabetes** is used to refer to raised (but not diabetic) blood glucose levels (also known as non-diabetic hyperglycaemia). People with pre-diabetes are at increased risk of progression to type 2 diabetes. They are also at increased risk of a range of other conditions including cardiovascular disease. Raised (but not diabetic) blood glucose can be identified in fasting samples, or those taken 2 hours after a standard glucose test. The World Health Organization[1] defines it in two ways, as follows:

- Impaired fasting glucose (IFG) – a fasting plasma glucose of greater than or equal to 6.1 and less than 7.0 mmol per litre.

[1] World Health Organization (2006) Definition and diagnosis of diabetes mellitus and intermediate hyperglycaemia: report of a WHO/IDF consultation [online]. Available from www.who.int/diabetes/publications/Definition%20and%20diagnosis%20of%20diabetes_new.pdf

- Impaired glucose tolerance (IGT) – a fasting plasma glucose of less than 7 millimoles (mmol) and a plasma glucose of greater than or equal to 7.8 and less than 11.1 mmol per litre 2 hours after ingestion of a 75 g oral glucose load (the **oral glucose tolerance test**).

In 2009, an international expert committee[2] suggested that a level of 6.0–6.5% glycated haemoglobin (HbA_{1c}) could be a suitable pre-diabetic indicator. The committee comprised representatives of the American Diabetes Association, European Association for the Study of Diabetes and the International Diabetes Federation. In 2011, the World Health Organization is expected to revise its diagnostic criteria in line with this – and the expert committee's other recommendations on diabetes.

Obesity

The following table defines a healthy weight, what it means to be overweight and different degrees of obesity[3].

Classification	BMI (kg/m^2)
Healthy weight	18.5–24.9
Overweight	25–29.9
Obesity I	30–34.9
Obesity II	35–39.9
Obesity III	40 or more

Obesity is the single greatest risk factor for pre-diabetes and type 2 diabetes. In addition, having a large waist circumference increases the risk of developing diabetes:

- Men are at high risk if they have a waist circumference of 94–102 cm (37–40 inches). They are at very high risk if it is more than102 cm.

- Women are at high risk if they have a waist circumference of 80–88 cm (31.5–35 inches). They are at very high risk if it is more than 88 cm.

[2] The International Expert Committee (2009) International expert committee report on the role of the A1C assay in the diagnosis of diabetes. Diabetes Care 32 (7): 1327–34.
[3] This is an extract from 'Obesity' (2006) NICE clinical guideline 43.

NICE's obesity guidance notes that the above classification may not apply to some population groups, such as Asians and older people. For example, Asian adults with a BMI lower than the overweight classification may be at greater risk of developing conditions and diseases associated with being overweight or obese. While older people with a BMI higher than the overweight classification may be at less risk. Clinical judgement is needed when considering the risks for these groups, even for people not classified as being overweight or obese.

Types of intervention

This guidance recommends local interventions to identify need and develop and provide programmes for communities at increased risk, as part of an overall prevention strategy. It also recommends national initiatives to address the adverse environmental factors driving the increasing prevalence of type 2 diabetes.

The second piece of guidance, 'Preventing the progression of pre-diabetes to type 2 diabetes in adults', will focus on preventing the development of type 2 diabetes in individuals with raised or impaired glucose levels. It will define the processes for identifying and monitoring those at high risk and how to provide them with effective one-to-one interventions and other support.

Guiding principles

Pre-diabetes and type 2 diabetes share the same risk factors (the main one being obesity). These risk factors are also common to other chronic diseases including cardiovascular disease and some cancers. This means that recommendations made in previously published NICE guidance can also help prevent type 2 diabetes. Specifically, the following published statements underpin many of the recommendations in this guidance.

Supporting behaviour change[4]

Changing people's health-related behaviour involves:

[4] This is an edited extract from 'Behaviour change' (2007) NICE public health guidance 6 which should be read in conjunction with these recommendations.

- Helping them to understand the short, medium and longer-term consequences of health-related behaviour.

- Helping them to feel positive about the benefits and value of health-enhancing behaviours and changing their behaviours.

- Recognising how people's social contexts and relationships may affect their behaviour.

- Helping people plan changes in terms of easy sustainable steps over time.

- Identifying and planning for situations that might undermine the changes people are trying to make and plan explicit 'if–then' coping strategies to prevent relapse.

Achieving and maintaining a healthy weight

People who are overweight or obese are more likely to achieve and maintain a healthy weight if they lose it gradually by eating healthily and being physically active[5]: They should:

- base meals on starchy foods such as potatoes, bread, rice and pasta, choosing wholegrain where possible
- eat fibre-rich foods such as oats, beans, peas, lentils, grains, seeds, fruit, vegetables, wholegrain bread and brown rice and pasta
- eat at least five portions of a variety of fruit and vegetables each day, in place of foods higher in fat and calories
- adopt a low-fat diet
- avoid increasing fat or calorie intake
- consume as little as possible of fried food; drinks and confectionery high in added sugars (such as cakes, pastries and 'fizzy' drinks); alcoholic drinks high in calories; and other food high in fat and sugar (such as some take-away and fast foods)

[5] The first nine criteria in this list are an edited extract from a recommendation in 'Obesity' (2006). NICE clinical guideline 43. The last criterion is an edited extract from a recommendation in 'Physical activity in the workplace' (2008). NICE public health guidance 13.

- watch the portion size of meals and snacks, and how often they are eating
- eat breakfast
- make activities such as walking, cycling, swimming, aerobics and gardening a routine part of life and build other activity into the daily routine – for example, by taking the stairs instead of the lift or taking a walk at lunchtime
- minimise sedentary activities, such as sitting for long periods watching television, at a computer or playing video games
- use physically active forms of travel such as walking, cycling and rollerblading.

Effective weight-loss programmes[6]

Effective weight-loss programmes should:

- address the reasons why someone might find it difficult to lose weight
- be tailored to individual needs and choices
- be sensitive to the person's weight concerns
- be based on a balanced, healthy diet
- encourage regular physical activity
- expect people to lose no more than 0.5–1 kg (1–2 lb) a week
- identify and address barriers to change.

Physical activity

The national recommendations are:

- To achieve general health benefits: accumulate at least 30 minutes of at least moderate-intensity physical activity on 5 or more days of the week[7].

- To lose weight: most people may need to do 45–60 minutes of moderate-intensity activity a day, particularly if they do not reduce their energy intake.

[6] This is an edited extract from a recommendation that appears in 'Obesity' (2006). NICE clinical guideline 43.
[7] DH (2004) At least five a week: evidence on the impact of physical activity and its relationship to health. London: The Stationery Office.

- People who have been obese and have lost weight may need to do 60–90 minutes of activity a day to avoid regaining weight[6].

Cultural appropriateness

Culturally appropriate interventions take account of the community's cultural or religious beliefs and linguistic and literacy skills[8] by:

- Using community resources to improve awareness of, and increase accessibility to, interventions. For example, they involve community organisations and leaders early on in the development stage, use media, plan events or make use of festivals specific to black and ethnic minority groups.

- Understanding the target community and the messages that resonate with them.

- Identifying and addressing barriers to access and participation, for example, by keeping costs low to ensure affordability, and by taking account of different working patterns and education levels.

- Developing communication strategies which are sensitive to language use and information requirements. For example, they involve staff who can speak the languages used by the community. In addition, they may provide information in different languages and for varying levels of literacy (for example, by using colour-coded visual aids and the spoken rather than the written word).

- Taking account of cultural or religious values, for example, the need for separate physical activity sessions for men and women, or in relation to body image, or beliefs and practices about hospitality and food. They also take account of religious and cultural practices that may mean certain times of the year, days of the week, settings, or timings are not suitable for

[8] Netto G, Bhopal R, Lederle N et al. (2010) How can health promotion interventions be adapted for minority ethnic communities? Five principles for guiding the development of behavioural interventions. Health Promotion International 25 (2): 248–57.
Hawthorne K, Robles Y, Cannings-John R et al. (2010) Culturally appropriate health education for type 2 diabetes in ethnic minority groups: a systematic and narrative review of randomised controlled trials. Diabetic Medicine 27: 613–23.

community events or interventions. In addition, they provide opportunities to discuss how interventions would work in the context of people's lives.

- Considering how closely aligned people are to their ethnic group or religion and whether they are exposed to influences from both the mainstream and their community in relation to diet and physical activity.

Whose health will benefit?

- Adults (aged 18 and over) from low-income groups.
- Adults from black and minority ethnic groups.

Recommendation 1 Local joint strategic needs assessments

Who should take action?

Commissioners and providers working in national and local public health services, in partnership with local health commissioners, including GP consortia.

What action should they take?

- Use local, regional and national tools[9] and data from public health reports, the census, indices of deprivation and other sources of high quality data[10] to:
  - identify local communities at high risk of developing diabetes
  - assess their knowledge, awareness, attitudes and beliefs about the risk factors and their specific cultural, linguistic and literacy needs
  - identify what interventions are already being implemented locally and assess their effectiveness
  - make recommendations for future investment and disinvestment.

[9] For example, 'Guidance on joint strategic needs assessment' available online at the Department of Health website: www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_081267.pdf

[10] For example, The Active People Survey available online at the Sport England website www.sportengland.org/research/active_people_survey.aspx

- Work with local organisations, including the voluntary sector, to gather the views of these communities[11] and ensure they are closely involved in the planning, design, management and delivery of health promotion activities.

- Identify local resources and existing community groups that could help promote healthy eating, physical activity and weight management to these communities.

- Identify successful local interventions and note any gaps in service provision.

Recommendation 2 Developing a local strategy to prevent diabetes

Who should take action?

Commissioners and providers working in national and local public health services, in partnership with local health commissioners, including GP consortia.

What action should they take?

- Based on the joint strategic needs assessment, develop an overall strategy aimed at preventing diabetes. This should:
    - create local environments that encourage people to adopt a healthier diet and be more physically active
    - target specific at-risk communities
    - provide interventions for individuals who are deemed at particular risk (based on clear criteria about the level of absolute risk which would trigger this provision). (Please see 'Preventing the progression of pre-diabetes to type 2 diabetes in adults' for more on this.)

- Closely link the strategy to local activities and programmes to prevent other chronic diseases (including cardiovascular disease), improve physical activity levels and improve people's diets.

[11] This recommendation should be read in conjunction with 'Community engagement' (2008). NICE public health guidance 9.

Recommendation 3 Conveying messages about lifestyle and the risk of diabetes

Who should take action?

Commissioners and providers working in national and local public health services, in partnership with:

- the NHS: local health commissioners and key staff within GP consortia (for example, GPs, practice and community nurses, dietitians, public health nutritionists and those working in ante and postnatal services); community pharmacists; and doctors and nurses working in acute and emergency care
- local authorities: education providers and managers of leisure services
- voluntary sector: community leaders, voluntary workers and those working for charities and non-profit organisations
- those working in the commercial sector.

What action should they take?

- Work with practitioners, role models and peers from the local community to develop consistent, clear and culturally appropriate messages on how to prevent diabetes and giving details of the support services available.

- Ensure information is presented in a format that meets the community's religious, cultural, age, gender, linguistic and literacy needs. Address issues such as stigma and fatalism regarding the development of diabetes and the assumption that weight gain is inevitable in mid and later-life.

- When the opportunity arises, disseminate these messages and information to black and minority ethnic groups and lower socioeconomic communities. Use local newspapers, television and radio channels targeted at specific black and minority ethnic communities. Also make use of local shops and businesses, community workers and groups, educational institutions, workplaces, places of worship and local medical establishments, for example, hospitals.

- Offer communities support to improve their diet and physical activity levels.

- Ensure people at high risk of diabetes know how to access appropriate services.

- Consider running mass-media campaigns to raise awareness of the lifestyle changes that can help reduce the risk of diabetes (where possible and appropriate, utilise established national campaigns). These should highlight the need to reduce the amount of time spent being sedentary and highlight the importance of being physically active and adopting a healthy diet. Messages should aim to increase awareness of what constitutes an effective level of physical activity. They should also increase awareness of the calorie content of standard-portion sizes of energy-dense foods and drinks (such as confectionery, fast foods and sweetened drinks).

- Communication specialists should monitor media and other campaigns promoting the prevention of diabetes. This includes campaigns that generally promote a healthier lifestyle. They should establish relationships with broadcast and Internet-based mass and specialist media to ensure accurate information is communicated on the risks and how to prevent diabetes.

Recommendation 4 Targeting interventions at communities at risk of diabetes

Who should take action?

Commissioners and providers working in national and local public health services, in partnership with:

- the NHS: local health commissioners and key staff within GP consortia (for example, GPs, practice and community nurses, dietitians, public health nutritionists and those working in ante and postnatal services); community pharmacists; doctors and nurses working in acute and emergency care; and occupational therapists

- local authorities: including commissioners and managers, education providers and managers of leisure services, planning departments and public transport providers

- voluntary organisations, community leaders and trained lay workers.

What action should they take?

- Work in partnership to develop physical activity, dietary and weight management interventions that are culturally appropriate for black and minority ethnic groups and lower socioeconomic communities. Identify any skills gaps and train or recruit staff to fill the gaps.

- Identify and address barriers to participation. This includes developing communication strategies which are sensitive to language use and information requirements.

- Use community resources to improve awareness of the key messages and to increase accessibility to the interventions. For example, involve community organisations and leaders at the development stage, use the media, plan events or attend festivals specifically aimed at black and minority ethnic groups. Also involve existing community groups or clubs, such as mother and toddler groups and local football clubs.

- Recruit lay workers from black and minority ethnic groups and from low-income communities to deliver interventions to prevent diabetes among these communities.

- Where necessary, train lay workers in how to plan, design and deliver community-based health promotion activities. Training should be focused, structured and based on proven training models and evaluation techniques. It should give participants the chance to practice their new skills out in the community. It should also encourage them to pass on the knowledge they have learnt to their peers.

- Lay workers and health professionals should identify '**community champions**' for example, religious and community leaders. They should encourage these champions to promote healthy eating and physical activity and, in particular, to participate in interventions to prevent diabetes.

- Encourage lay workers to recruit other members of their community[12].

- Ensure lay workers work as part of a wider team led by health professionals. They should be involved in the planning, design and delivery of credible and culturally appropriate messages[13]. This includes helping people to develop the practical skills they need to adopt a healthier lifestyle for example, by running cookery classes or physical activity sessions. Management and supervision of these activities should be provided by the health professionals leading these teams.

- Commission culturally appropriate weight management programmes either from the NHS or commercial providers. These should be provided in areas where populations at high risk of diabetes live and should be located in community settings (for example, mosques and social clubs).

- Ensure systems or initiatives used to assess individual-level risk in high-risk communities are culturally appropriate.

- Ensure identification and assessment systems or initiatives are linked to effective services and interventions for individuals deemed to be at high risk.

Recommendation 5 Creating local environments that support healthy food choices

Who should take action?

Commissioners and providers working in national and local public health services, in partnership with:

- the NHS: including public health nutritionists, dietitians, commissioners and procurement teams

[12] This is an edited extract from a recommendation that appears in 'Community engagement' (2008). NICE public health guidance 9.
[13] This is an edited extract from a recommendation that appears in 'Community engagement' (2008). NICE public health guidance 9.

- local authorities: including commissioners and managers, education providers and managers of leisure services, planning departments and public transport providers
- voluntary organisations and community leaders.

What action should they take?

- Increase people's awareness of their eligibility for benefits and wider schemes that will supplement the family's food budget and improve their eating patterns. This includes free school meals, free school fruit and Healthy Start food vouchers. Also consider providing information on how to produce healthier meals and snacks on a budget.

- Work with local food retailers, caterers and workplaces to encourage local provision of affordable fruit and vegetables and other food and drinks that can contribute to a healthy, balanced diet.

- Ensure interventions such as cookery classes are provided at times to suit those with children (or provide a crèche). They should also take place in acceptable and accessible venues such as within children's centres.

- Local planning departments should strive to increase the opportunities available for local people to adopt a healthy, balanced diet by ensuring:
  - large and medium-sized food retail developments are readily accessible locally, either on foot or via public transport
  - planning policies restrict permission for less healthy food outlets in specific areas, for example, near to schools
  - planning policies take into account the needs of, and barriers faced by, particular subgroups[14].

- Local authorities and the NHS should encourage local retailers that serve low-income communities to use subsidies (such as voucher schemes) and incentives (such as promotional offers) to promote healthier food and drink options. The aim should be to make the healthier choice the easiest and

[14] This is an edited extract from a recommendation that appears in 'Prevention of cardiovascular disease' (2010). NICE public health guidance 25.

relatively cheaper choice. The retailers targeted may include street markets and small independent shops.

- Local authorities and the NHS should set an example as employers, by developing policies to prevent obesity, in line with existing NICE guidance and (in England) the local obesity strategy. For example, they should always promote healthier food and drink choices in restaurants, hospitality suites, vending machines and shops for staff and clients. (This could be achieved by using posters, pricing and positioning of products.)

Recommendation 6 Creating local environments that support physical activity

Who should take action?

Commissioners and providers working in national and local public health services, in partnership with:

- local authorities: including local planning departments
- the NHS: including commissioning and procurement teams.

What action should they take?

- Local public health services should assess the type of physical activity opportunities needed locally and at what times and where. They should consider social norms, family practices and any fears people may have about the safety of areas where activities are sited (this includes fears about how safe it is to travel there and back).

- Local public health services should map local physical activity opportunities against local needs and address any gaps in provision.

- Local authorities should ensure council-run leisure services are affordable and acceptable to those at high risk of developing diabetes. This includes providing affordable childcare facilities and public transport links. It also includes ensuring the environment is culturally acceptable. For example, local authorities should consider the appropriateness of any videos and music played. They should also consider providing single-sex facilities,

exercise classes, swimming sessions and walking groups – for both men and women.

- Local planning departments should ensure:
  - planning policies provide for physical activity in safe locations that are accessible locally either on foot or via public transport
  - the local infrastructure encourages people to be physically active as part of their daily routine (for example, by allowing them to walk to the shops and work)
  - the internal infrastructure of buildings encourages physical activity, for example, by encouraging people to take the stairs rather than the lift[15].

- Local authorities and the NHS should develop 'active travel' plans for their staff and visitors to encourage them to opt for healthier modes of transport to and from their premises. Walking and cycling can be encouraged by providing showers and secure cycle parking. Signposting and improved decor could encourage them to use the stairs rather than the lift when at work. In addition, people could be encouraged to be active in lunch breaks and at other times, through organised walks and subsidies for local leisure facilities[16].

- Local public health services should provide information on local, affordable, practical and culturally acceptable opportunities to be more active. If cultural issues affect people's ability to participate, they should work with them to identify activities which may be acceptable. (This may include, for example, single-gender swimming or exercise classes and Asian dance classes.)

[15] This is an edited extract from a recommendation that appears in 'Physical activity and the environment' (2008). NICE public health guidance 8.
[16] This is an extract from a recommendation that appears in 'Obesity' (2006). NICE clinical guideline 43 and a recommendation that appears in 'Promoting physical activity in the workplace' (2008). NICE public health guidance 13.

- Local public health services should work with local employers to implement, and increase employee's awareness of their eligibility for, 'salary sacrifice'[17] and other schemes that promote physical activity in the workplace.

Recommendation 7 Training health professionals

Who should take action?

- Commissioners and providers working in national and local public health services, in partnership with:

    - the NHS: local health commissioners and key staff within GP consortia (for example, GPs, practice and community nurses, dietitians, public health nutritionists and those working in ante and post-natal services); community pharmacists; and doctors and nurses working in acute and emergency care

    - royal colleges and professional associations, further and higher education training boards, and other organisations responsible for setting competencies and developing continuing professional development programmes for health professionals

    - local authorities: including education providers and managers of leisure services

    - voluntary organisations: including community leaders and voluntary workers

    - those working in the commercial sector.

[17] Salary sacrifice occurs when an employee agrees to give up part of their salary for an agreed period (in the case of the Cycle to Work scheme this is usually 12 months) in exchange for some kind of non-cash benefit, such as the loan of a bicycle and safety equipment.

What action should they take?

- Ensure all health professionals are trained to identify people from communities at increased risk of developing diabetes. They should also be trained to understand the cultural, religious and economic influences on these communities. Ensure they are given time and support to develop and maintain these skills.

- Monitor health professionals' knowledge and awareness using, for example, personal development plans and annual reviews.

- Ensure curricula and continuing professional development programmes for health professionals incorporate the knowledge and skills needed to ensure health promotion interventions are culturally sensitive.

- Ensure medical undergraduate training covers nutrition, physical activity and weight management in relation to the prevention of type 2 diabetes.

- Ensure training is focused, structured and based on proven models and evaluation techniques. It should offer opportunities to practice the new skills out in the community. It should also help health professionals to spread their knowledge among colleagues.

Recommendation 8 National-level action to promote an environment that supports a healthy diet

Who should take action?

Commissioners and providers of national and local public health services in the public and private sector.

What action could they take?

Identify and work with a range of commercial partners to promote the provision of healthier food choices. For example:

- Work with food manufacturers to change the composition of prepared foods where needed. This could include reducing the calorie, fat and salt content through product reformulation.

- Work with caterers to help them provide healthier food and drink choices as the default option.

- Work with food retailers to develop pricing structures that favour healthier food and drink choices and to ensure there is a broad range of portion sizes on sale, particularly for energy-dense foods and drinks. The aim is to allow greater consumer choice.

- Work with food manufacturers, caterers and retailers to provide clear, non-ambiguous and consistent nutrition information. This includes prominent displays of calorie content on the front of packaging and the use of clear signage for unpackaged foods.

- Support the development of home cooking resources which give information on the nutritional content of foods prepared at home and offer practical advice on preparing healthier meals. (Resources might include websites offering recipe suggestions.)

Recommendation 9 National-level action to promote an environment that supports physical activity

Who should take action?

- National and local public health services, including data collection services.

- Organisations with a remit for increasing physical activity levels or helping to reduce levels of obesity.

What action could they take?

- Ensure the benefits of physical activity – and what constitutes an effective level of physical activity – are made clear to encourage people to be more physically active.

- Support a shift in the population towards being more physically active by encouraging even small changes.

- Monitor the population's overall physical activity levels to determine the success of national-level interventions.

- Assess the health impact of all initiatives and interventions to encourage physical activity.

- Establish national and local systems to ensure action to encourage physical activity is linked to transport policy, the design of new buildings and the wider built environment.

2 Public health need and practice

Overview

On average, 100,000 people in the UK are diagnosed with type 2 diabetes every year, but in 2009 this figure reached 150,000[18]. Many more are unaware that they have the condition (Diabetes UK 2006). It can lead to long-term complications including eye problems, kidney disease, foot ulcers and cardiovascular disease. On average at age 55, the life expectancy of people with type 2 diabetes is 5 to 7 years less than for the general population (DH 2006).

Between 10% and 20% of people with pre-diabetes will go on to develop type 2 diabetes over a period of 3–6 years (Forouhi et al. 2007). Higher estimates are seen in clinical trial settings. However, this is due to the fact that higher risk participants are recruited to these trials and are frequently retested, which has the effect of increasing the apparent incidence. People with pre-diabetes are also at higher risk of developing cardiovascular disease compared to people with normal glucose tolerance (Waugh et al. 2007).

In addition to the personal cost to individuals, families and communities, diabetes is estimated to account for at least 5% of UK healthcare expenditure. For example, up to 10% of hospital budgets are spent on the condition – it is estimated that drug costs alone for people with type 2 diabetes account for about 7% of the total NHS drugs budget (Waugh et al. 2007).

[18] www.diabetes.org.uk/About_us/News_Landing_Page/Number-diagnosed-with-diabetes-rises

In 2007, 60% of primary care trusts (PCTs) reported that programmes were in place to raise public awareness of the risk factors for diabetes – and 37% were raising awareness of its signs and symptoms. However, only 42% had assessed the needs of their population in relation to diabetes – and less than 40% had developed a diabetes strategy (Innove 2008).

Type 2 diabetes risk factors

People from certain communities are particularly at risk. This includes people of South Asian, African-Caribbean, black African and Chinese descent and those from lower socioeconomic groups.

General risk factors for type 2 diabetes include: obesity (a **body mass index** [BMI] of 30 kg/m^2 or more), a large waist circumference (more than 80 cm or 31.5 inches in women and 94 cm or 37 inches in men), a sedentary lifestyle, a family history of type 2 diabetes, a history of gestational diabetes in women, and being older than 40 (or older than 25 for some black and minority ethnic groups). The more risk factors someone has, the more likely they are to develop diabetes (Harding et al. 2006).

Vulnerable groups

In England, type 2 diabetes is 40% more common among those who are in social class V (people who are most socioeconomically deprived) compared with those in social class I (The NHS Information Centre 2010). In addition, people in social class V are three and a half times more likely than those in social class I to be ill as a result of diabetic complications (DH 2002).

People in social class V are more likely to be obese than those in higher social classes. In 2004, 18% of men in social class I were obese compared to 28% in social class V. Similarly, 10% of women in social class I were obese compared with 25% of women in social class V (Foresight 2007).

There is also a clear link between physical activity and income level. For example, those on the lowest income are less likely to undertake more than 30 minutes of at least moderate-intensity activity a week compared with higher income groups (The NHS Information Centre 2008b).

The ‘Low income diet and nutrition survey’ found that, overall, people on lower incomes ate similar types and quantities of food as the general population. However, they were less likely to eat wholemeal bread, wholegrain and high fibre breakfast cereals and vegetables. They were also more likely to drink non-diet soft drinks and eat more processed meats, whole milk and sugar (Nelson et al. 2007).

South Asian people living in the UK are up to six times more likely to have type 2 diabetes than the white population (DH 2001). They are also likely to develop it 10 years earlier (Nicholl et al. 1986). People of African and African-Caribbean descent are three times more likely to have type 2 diabetes than the white population. It is also more common among Chinese and other non-white groups (DH 2001).

The higher risk facing South Asian people in the UK is due to the fact that even those with a BMI in the ’healthy‘ range (that is, 18.5–24.9 kg/m^2) may accumulate significantly more ‘metabolically active’ fat in the abdomen and around the waist. Metabolically active fat is closely associated with **insulin** resistance, pre-diabetes and type 2 diabetes (McKeigue et al. 1991; 1992; 1993; Banerji et al. 1999).

There is evidence that some black and minority ethnic groups are particularly sedentary (The NHS Information Centre 2006). Participation in physical activity of at least moderate-intensity for 30 continuous minutes is lower among minority ethnic groups than among the general population. Black Caribbean men are the only exception (The NHS Information Centre 2006).

There is overlap between the two high-risk groups, that is, those who are disadvantaged and some black and minority ethnic communities, as some of the latter are more likely to live in areas of social and economic deprivation (Barakat et al. 2001).

Tackling barriers to change

People from lower socioeconomic groups and those from black and minority ethnic communities may face economic, social and cultural barriers which

prevent them from being physically active and managing their weight. These include, for example, lack of funds for a healthy diet or a lack of awareness and opportunity to take part in physical activities or weight management programmes that are culturally acceptable.

3 Considerations

The Programme Development Group (PDG) took account of a number of factors and issues when developing the recommendations.

Pre-diabetes

3.1 This guidance addresses the prevention of 'pre-diabetes', a stage in the development of type 2 diabetes which starts with normal glucose metabolism. 'Pre-diabetes' is a widely recognised term that is often used by health professionals to communicate with patients and the public. However, there is a lack of consensus in the scientific literature – and between health professionals – about its usefulness. Categorising someone as having pre-diabetes is also problematic because glucose levels assessed through fasting glucose levels or glucose tolerance tests can vary in the short term. This means that people can move 'in' and 'out' of the pre-diabetes range over relatively short periods of time. The level of glycated haemoglobin (HbA_{1c}) may be a more appropriate indicator of pre-diabetes or type 2 diabetes as it is more stable over time.

3.2 The PDG was mindful that how someone responds to being labelled a 'pre-diabetic' may impact on the progress of their condition (Peel et al. 2004). Sometimes, being given a diagnosis or 'label' of an illness (even though pre-diabetes is technically a pre-disease state) may make someone more likely to comply with health promotion advice and change their behaviour. On the other hand, it may make them feel stigmatised and may even lead them to adopt a fatalistic attitude to their health. By the same token, people who are told that their blood glucose levels are normal may be falsely reassured that they are not at risk of developing type 2 diabetes. As a result, they may not adopt behaviours which will help prevent its development.

Individual versus population approaches

3.3 The PDG considered three different types of approach to preventing diabetes. These were:

- Individual: focusing on people identified as being at high risk of diabetes.
- High-risk population: identifying and targeting communities of people at high risk of diabetes.
- Total population: no assessment of risk or targeting of interventions.

3.4 The PDG noted that people from lower socioeconomic groups and from some black and minority ethnic communities are at higher risk of diabetes than the general population. This is due to a set of shared characteristics and behaviours or 'determinants'. Examples include: a higher than average level of obesity, a higher than average number of people on a poor diet, or lower than average levels of physical activity. These groups and communities would collectively benefit from interventions that target the 'shared' risk factors. In addition, more people within these groups and communities (compared with the general population) would benefit from an assessment of their individual risk – and individual interventions to alleviate that risk.

3.5 This guidance aims to reduce the risk of diabetes among adults most likely to develop it. Obesity is the single biggest risk factor for type 2 diabetes. Since recent estimates (for example, the Foresight report [2007]) suggest that more than half of adults may be obese by 2050, the PDG noted that some of the recommendations would also have a beneficial effect on the general population.

3.6 The national NHS Health Check programme identifies and treats individuals at high risk of developing vascular-related diseases including diabetes. The PDG noted that not all those who are

identified as being at risk will choose to change their behaviour or act on the advice. NICE guidance to prevent the progression from pre-diabetes to type 2 diabetes (see section 7) will aim to provide commissioners and practitioners with advice on how they can support people identified as being at high risk through this or other initiatives.

3.7 The PDG was mindful that actions to improve the health of the population overall may widen health inequalities between different groups. For example, people from higher socioeconomic groups may be more ready (or able) to change their behaviour than those on a lower income. Therefore, to address health inequalities, it may be necessary to specifically target higher risk groups – even if this is not the most cost-effective option.

3.8 Addressing the needs of high-risk communities involves working beyond geographical boundaries. A community is not necessarily a group of people living within a specific geographic location. It might, for example, involve people with shared values or a shared interest. In addition, although people may recognise themselves (and be recognised within a group) as belonging to that group or community, it may not be immediately obvious to 'outsiders'. This can make it difficult to identify and target some of those who may need help to prevent diabetes. This includes people who are homeless and those who have a disability or a long-term mental health problem. People who are unofficial migrants are another example.

3.9 Case studies of ongoing work in the UK, backed up by expert testimony, demonstrated the importance of taking the target group's needs into account from the start. This includes ensuring that any cultural sensitivities are acknowledged.

Evidence

3.10 Trials have shown (Gillies et al. 2007) that behavioural interventions help reduce the likelihood of diabetes developing among people with pre-diabetes. For example, the Finnish diabetes prevention study

(Tuomilehto et al. 2001) showed that the risk of these individuals developing type 2 diabetes is reduced if they achieve one or more of the following:

- reduce their weight by more than 5%
- keep their fat intake below 30% of energy intake
- keep their saturated-fat intake below 10% of energy intake
- eat 15 g/1000 kcal of fibre or more
- are physically active for at least 4 hours per week.

In addition, a recent population-based study (Simmons et al. 2006) found an inverse relationship between the number of these goals achieved and the risk of type 2 diabetes developing among the general population. Therefore, the PDG felt that interventions promoting these goals could significantly lower the risk of people from lower socioeconomic communities and from black and minority ethnic groups developing pre-diabetes and type 2 diabetes.

3.11 The systematic reviews considered did not identify any evidence directly related to the prevention of pre-diabetes among black and minority ethnic or lower socioeconomic groups in the UK. They did find evidence on the effectiveness of interventions to address a high body mass index (BMI), high waist measurement, sedentary lifestyle or poor diet among high-risk groups. Even so, relevant UK-based intervention studies were scarce. Similarly, the evidence on behaviour change among minority ethnic communities was very limited. The data available tended to be based on self-reported measures related to participants' perceptions of the barriers and facilitators to behaviour change. It was not clear whether or not addressing the stated barriers and introducing facilitators would actually result in positive change.

3.12 There was no evidence of effectiveness on UK interventions aiming to raise health professionals' awareness of pre-diabetes or to help them identify groups at risk. Evidence on the effectiveness of

interventions delivered by health professionals and lay workers (such as health trainers) was also lacking.

3.13 The potential effect of any intervention may vary according to the risk someone faces of developing pre-diabetes. However, evidence was not available to assess this theory in practice.

3.14 While demonstrating promising results, most of the UK-based community projects considered by the PDG had limited reach. The group felt that they were neither large nor sustainable enough and that they would benefit from being based on established community networks. Staff training for such interventions was another issue.

3.15 The PDG developed recommendations through inductive and deductive reasoning, based on the evidence presented in the systematic reviews, expert testimony and its members' knowledge, understanding and experience of the topic area. Due to the scarcity of evidence available, the PDG also drew on existing NICE guidance on: behaviour change, community engagement, obesity, physical activity and cardiovascular disease (see section 7).

3.16 The economic analysis for this work is based on a range of assumptions. The observed effect sizes for individuals, while important, are small and the confidence intervals are large. Most of the interventions considered are estimated to be cost effective (and usually very cost effective). (This assumes that the estimated effect sizes have been used to make the calculation.) The PDG recognised that the bulk of these effects were generally observed only after a number of years.

Existing NICE guidance

3.17 The PDG recognised that a number of existing activities and programmes aim to help people change their behaviour to prevent a range of diseases and conditions. It acknowledged that these activities and programmes could also help prevent diabetes and that

many have been the focus of earlier NICE guidance (see section 7). Similarly, the recommendations outlined in this guidance may have an impact on a range of other health conditions (including for example, cardiovascular disease, some common cancers, respiratory diseases and mental wellbeing).

3.18 There are many reasons why people who are disadvantaged can find it more difficult than others to change their behaviour (Swann et al. 2009). The recommendations in this guidance draw on NICE's public health guidance 6 'Behaviour change' (2007) in an attempt to address this inequality. The aim is to create a local environment which encourages people in disadvantaged groups to make change.

3.19 The PDG noted the recommendations made in NICE clinical guideline 43 'Obesity' (2006). These focus on a range of effective, community-based programmes and stress the importance of ensuring interventions are tailored, long term and address both diet and physical activity. The guideline also outlines strategies for improving diet and increasing physical activity to help prevent obesity and minimise excess weight gain.

3.20 The PDG discussed the links between sedentary behaviour and diabetes – and the need to encourage people to be more physically active. It was aware of evidence to suggest that the higher prevalence of diabetes among black and minority ethnic groups may be more attributable to a sedentary lifestyle than to diet. NICE has published a range of guidance to help the whole population be physically active (see section 7). The recommendations in this guidance attempt to address specific barriers to physical activity which might face populations at high risk of developing diabetes. However, more research is needed into how to increase physical activity levels among these groups.

3.21 The PDG recognised that the success of interventions can depend on identifying local 'key players' and 'champions' and it looked to

recommendations made in NICE public health guidance 9 ‘Community engagement’ (2008). It noted that, although some community leaders may be able to promote or help deliver diabetes prevention programmes, not all of them will be willing or able to do so – nor would it always be appropriate.

Issues outside the scope

3.22 The PDG acknowledged the need to consider risk factors and vulnerability at all stages of the life course. In particular, it recognised that maternal and early infant nutrition may be important in the prevention of non-communicable diseases such as diabetes. Interventions aimed at children are also likely to be crucial in reducing the prevalence of type 2 diabetes in the longer term. For example, preventing gestational diabetes and delaying the onset of type 2 diabetes until after childbearing age would reduce the risk of a child getting type 2 diabetes later in life. These issues were beyond the remit of this guidance. However, they are addressed in other NICE guidance (see section 7).

3.23 The upper age cut-off point for this guidance (74 years) reflects the age limit of the national NHS Health Check programme. This programme assesses the risk of heart disease, stroke, kidney disease and diabetes among all adults aged 40–74. It aims to help them reduce or manage their risk by giving them individually tailored advice. (One-to-one advice and other interventions for those aged 18 and above will be addressed in 'Preventing the progression of pre-diabetes to type 2 diabetes in adults'.)

3.24 The PDG did not consider evidence on how specific nutrients or types of diet may reduce the risk of pre-diabetes, as this falls under the remit of the Scientific Advisory Committee on Nutrition (SACN). As such, it was outside the scope of this guidance. However, the Group supports existing recommendations on healthy eating, as advocated in the 'Eat well' plate (Food Standards Agency 2007).

3.25 The PDG was aware of a range of factors that need to be tackled at national and international level to help high-risk groups adopt behaviours that minimise the risk of diabetes. This includes issues that could be tackled by the food industry, such as the fat content of foods, food labelling, advertising and costs. It also includes issues in relation to the built environment, such as the impact of planning decisions on physical activity levels. The PDG wholeheartedly

supported existing NICE recommendations which aim to tackle these issues. It was also mindful that disadvantaged groups may be disproportionately affected and that, as such, any solutions should consider the potential impact on these groups.

This section will be completed in the final document.

4 Implementation

NICE guidance can help:

- NHS organisations, social care and children's services meet the requirements of the DH's revised 'Operating framework for 2010/11'.
- National and local organisations improve quality and health outcomes and reduce health inequalities.
- Local authorities fulfil their remit to promote the wellbeing of communities.
- Local NHS organisations, local authorities and other local partners benefit from any identified cost savings, disinvestment opportunities or opportunities for re-directing resources.
- Provide a focus for multi-sector partnerships for health, such as the integration of health and social care and health improvement.

NICE will develop tools to help organisations put this guidance into practice. Details will be available on our website after the guidance has been issued (www.nice.org.uk/guidance/PHG/Wave19/6

5 Recommendations for research

The Programme Development Group (PDG) recommends that the following research questions should be addressed. It notes that ‘effectiveness’ in this context relates not only to the size of the effect, but also to cost effectiveness and duration of effect. It also takes into account any harmful/negative side effects.

1. How effective and cost effective are interventions which use either a 'total population' or 'high-risk population' approach to preventing diabetes among people from black and minority ethnic or lower socioeconomic groups?

2. What are the most effective and cost effective ways of developing, implementing and assessing tailored and culturally appropriate interventions to prevent diabetes among people at high risk? This includes people from a range of black and minority ethnic groups and those from lower socioeconomic communities.

3. Which participatory approaches are most effective and cost effective when developing the awareness, knowledge, understanding and skills of healthcare professionals and others responsible for people at high risk of developing pre-diabetes?

4. How do socioeconomic, environmental, biological and psychosocial factors determine diet and physical activity behaviours and how do they contribute to differences in the risk of developing diabetes?

5. How do financial factors (including incentives, pricing and taxation of food and incentives, and pricing for physical activity opportunities) affect food and physical activity choices?

More detail on the gaps in the evidence identified during development of this guidance is provided in appendix D.

6 Updating the recommendations

This section will be completed in the final document.

7 Related NICE guidance

Published

Weight management before, during and after pregnancy. NICE public health guidance 27 (2010). Available from www.nice.org.uk/guidance/PH27

Prevention of cardiovascular disease. NICE public health guidance 25 (2010). Available from www.nice.org.uk/guidance/PH25

Type 2 diabetes – newer agents. NICE clinical guideline 87 (2009). Available from www.nice.org.uk/guidance/CG87

Autologous pancreatic islet cell transplantation for improved glycaemic control after pancreatectomy. NICE interventional procedure guidance 274 (2008). Available from www.nice.org.uk/guidance/IPG274

Diabetes: insulin pump therapy. NICE technology appraisal guidance 151 (2008). Available from www.nice.org.uk/guidance/TA151

Type 2 diabetes: the management of type 2 diabetes (update). NICE clinical guideline 66 (2008). Available from www.nice.org.uk/guidance/CG66

Diabetes in pregnancy. NICE clinical guideline 63 (2008). Available from www.nice.org.uk/guidance/CG63

Maternal and child nutrition. NICE public health guidance 11 (2008). Available from www.nice.org.uk/guidance/PH11

Physical activity and the environment. NICE public health guidance 8 (2008). Available from www.nice.org.uk/guidance/PH8

Behaviour change. NICE public health guidance 6 (2007). Available from www.nice.org.uk/guidance/PH6

Diabetes (type 1 and 2) – inhaled insulin. NICE technology appraisal guidance 113 (2006). Available from www.nice.org.uk/guidance/TA113

Obesity. NICE clinical guideline 43 (2006). Available from www.nice.org.uk/guidance/CG43

Type 1 diabetes. NICE clinical guideline 15 (2004). Available from www.nice.org.uk/guidance/CG15

Type 2 diabetes: footcare. NICE clinical guideline 10 (2004). Available from www.nice.org.uk/guidance/CG10

Allogeneic pancreatic islet cell transplantation for type 1 diabetes mellitus. NICE interventional procedure guidance 257 (2003). Available from www.nice.org.uk/guidance/IPG257

Diabetes (type 1 and 2) – patient education models. NICE technology appraisal guidance 60 (2003). Available from www.nice.org.uk/guidance/TA60

Diabetes (type 1 and 2) – long acting insulin analogues. NICE technology appraisal guidance 53 (2002). Available from www.nice.org.uk/guidance/TA53

Under development

Preventing the progression of pre-diabetes to type 2 diabetes in adults. NICE public health guidance (publication expected May 2012).

8 Glossary

Body mass index

Body mass index (BMI) is commonly used to measure whether or not adults are a healthy weight or underweight, overweight or obese. It is defined as the weight in kilograms divided by the square of the height in metres (kg/m^2).

Community

A group of people who have common characteristics. Communities can be defined by location, race, ethnicity, age, occupation, a shared interest (such as using the same service), a shared belief (such as religion or faith) or other common bonds. A community can also be defined as a group of individuals living within the same geographical location (such as a hostel, a street, a ward, town or region).

Community champions

Community champions are inspirational figures, community entrepreneurs, mentors or leaders who 'champion' the priorities and needs of their communities and help them build on their existing skills. They drive forward

community activities and pass on their expertise to others. They also provide support, for example, through mentoring, helping people to get appropriate training and by helping to manage small projects.

Diabetes

Diabetes is caused when there is too much glucose in the blood and the body cannot use it as 'fuel' because the pancreas does not produce any or sufficient insulin to help it to enter the body's cells. Alternatively, the problems may be caused because the insulin produced may not work properly (insulin resistance'). Also see 'glucose' and 'insulin'.

Glucose

Glucose comes from digesting carbohydrate and is also produced by the liver. Carbohydrate comes from many different kinds of food and drink, including starchy foods such as bread, potatoes and chapatis; fruit; some dairy products; sugar and other sweet foods. (Diabetes UK 2010)

Insulin

Insulin is the hormone produced by the pancreas that allows glucose to enter the body's cells, where it is used as fuel for energy. It is vital for life. (Diabetes UK 2010)

Oral glucose tolerance test

An oral glucose tolerance test involves measuring the glucose level after fasting, and then 2 hours after drinking a standard 75 g glucose drink. Fasting is defined as no calorie intake for at least 8 hours. More than one test on separate days is required for diagnosis in the absence of hyperglycaemic symptoms.

Physical activity

The full range of human movement, from competitive sport and exercise to active hobbies and walking, cycling and the other physical activities involved in daily living.

Type 2 diabetes

Type 2 diabetes (non-insulin dependent diabetes) results from reduced tissue sensitivity to insulin (insulin resistance) and/or reduced insulin production.

9 References

Banerji MA, Faridi N, Atluri R et al. (1999) Body composition, visceral fat leptin and insulin resistance in Asian Indian men. Journal of Clinical Endocrinology and Metabolism 84: 137–44

Barakat K, Stevenson S, Wilkinson P et al. (2001) Socio-economic differentials in recurrent ischaemia and mortality after acute myocardial infarction. Heart 85: 390–4

Department of Health (2001) Modern standards and service models – diabetes: national service framework standards. London: Department of Health

Department of Health (2002) National service framework for diabetes: standards – supplementary information. Health inequalities in diabetes. London: Department of Health

Department of Health (2006) Turning the corner: improving diabetes care. London: Department of Health

Diabetes UK (2006) Diabetes and the disadvantaged: reducing health inequalities in the UK. A report by the All Party Parliamentary Group for Diabetes and Diabetes UK [online]. Available from www.diabetes.org.uk/Documents/Reports/Diabetes_disadvantaged_Nov2006.pdf

Diabetes UK (2010) Guide to diabetes: what is diabetes? [online]. Available from www.diabetes.org.uk/Guide-to-diabetes/Introduction-to-diabetes/What_is_diabetes/

Food Standards Agency (2007) Eatwell plate [online]. Available from www.eatwell.gov.uk/healthydiet/eatwellplate/

Foresight (2007) Tackling obesities: future choices – project report. London: Government Office for Science

Forouhi NG, Luan J, Hennings S et al. (2007) Incidence of type 2 diabetes in England and its association with baseline impaired fasting glucose: The Ely study 1990–2000. Diabetic Medicine 24: 200–7

Gillies CL, Abrams KR, Lambert PC et al. (2007) Pharmacological and lifestyle interventions to prevent or delay type 2 diabetes in people with impaired glucose tolerance: systematic review and meta-analysis. BMJ 334: 299–307

Goodyear LJ, Khan BB (1998) Exercise, glucose transport, and insulin sensitivity. Annual Review of Medicine 49: 235–61

Harding A, Griffin SJ, Wareham NJ (2006) Population impact of strategies for identifying groups at high risk of type 2 diabetes. Preventative Medicine 42 (5): 364–8

Hawthorne K, Robles Y, Cannings-John R et al. (2010) Culturally appropriate health education for type 2 diabetes in ethnic minority groups: a systematic and narrative review of randomised controlled trials. Diabetic Medicine 27: 613–23

Innove (2008) Delivering performance improvement. Findings from DiabetesE third national report [online]. Available from www.diabetes.nhs.uk/news-folder/DiabetesE%20Third%20National%20Report%20Abridged%20Version%20FINAL%20(Feb%202008).pdf

Khan BB, Flier JS (2000) Obesity and insulin resistance. The Journal of Clinical Investigation 106: 473–81

McKeigue PM, Shah B, Marmot MG (1991) Relation of central obesity and insulin resistance with high diabetes prevalence and cardiovascular risk in South Asians. Lancet 337: 382–6

McKeigue PM, Pierpont T, Ferne JM et al. (1992) Relationship of glucose intolerance and body fat pattern in South Asians and Europeans. Diabetologia 35: 785–91

McKeigue PM, Ferne JE, Pierpont T et al. (1993) Association of early onset coronary heart disease in South Asian men with glucose intolerance and hyperinsulinaemia. Circulation 87: 152–61

Nelson M, Erens B, Bates B et al. (2007) Low income diet and nutrition survey. London: The Stationery Office

Nicholl CG, Levy JC, Mohan V et al. (1986) Asian diabetes in Britain: a clinical profile. Diabetic Medicine 3: 257–60

Peel E, Parry O, Douglas M et al. (2004) Diagnosis of type 2 diabetes: a qualitative analysis of patients' emotional reactions and views about information provision. Patient Education and Counselling 53 (3): 269–75

Simmons RK, Harding AH, Jakes RW et al. (2006) How much might achievement of diabetes prevention behaviour goals reduce the incidence of diabetes if implemented at the population level? Diabetologia 49 (5): 905–11

South Asian Health Foundation (2004) The epidemic of coronary heart disease in South Asians. Birmingham: South Asian Health Foundation

Swann C, Owen L, Carmona C et al. (2009) A nudge in the right direction: developing guidance on changing behaviour. In Killoran A, Kelly MP (editors). Evidence-based public health: effectiveness and efficiency. Oxford: Oxford University Press

The NHS Information Centre (2006) Health survey for England 2004. Volume 1: the health of minority ethnic groups. Leeds: The NHS Information Centre

The NHS Information Centre (2008a). Health survey for England 2006. Volume 1: cardiovascular risk factors in adults. Leeds: The NHS Information Centre

The NHS Information Centre (2008b) Health survey for England 2006: Cardiovascular disease and risk factors: summary of the key findings. Leeds: The NHS Information Centre

The NHS Information Centre (2009) The Health survey for England 2008. Volume 1: physical activity and fitness. Leeds: The NHS Information Centre

The NHS Information Centre (2010) National diabetes audit: executive summary 2008–2009 [online]. Available from www.ic.nhs.uk/nda

Tuomilehto J, Lindstrom J, Eriksson JG et al. (2001) Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. New England Journal of Medicine 344: 1343–50

Waugh N, Scotland G, McNamee P et al. (2007) Screening for type 2 diabetes literature review and economic modelling. Health technology assessment 11: 17 [online]. Available from www.ncbi.nlm.nih.gov/pubmed/17462167

World Health Organization (2010) Cancer: diet and physical activity's impact [online]. Available from www.who.int/dietphysicalactivity/publications/facts/cancer/en/

Appendix A Membership of the Programme Development Group (PDG), the NICE project team and external contractors

Programme Development Group

PDG membership is multidisciplinary. The Group comprises public health practitioners, clinicians, local authority officers, teachers, social care professionals, academics, technical experts and representatives of the public as follows.

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Palida Teelucknavan Coordinator

Sue Jelley Senior Editor

Alison Lake Editor

External contractors

Evidence reviews

Review 1: 'Prevention of type 2 diabetes: interventions to reduce risk factors for pre-diabetes among UK adults from a lower socioeconomic group' was carried out by the School of Health and Related Research (ScHARR) Public Health Collaborating Centre. The principal authors were: Maxine Johnson, Emma Everson-Hock, Roy Jones, Helen Buckley Woods, Sue Baxter, Elizabeth Goyder, Jim Chilcott and Nick Payne.

Review 2: 'Prevention of type 2 diabetes: interventions to reduce risk factors for pre-diabetes among UK adults from black and minority ethnic groups' was carried out by ScHARR Public Health Collaborating Centre. The principal authors were: Maxine Johnson, Emma Everson-Hock, Roy Jones, Helen Buckley Woods, Sue Baxter, Elizabeth Goyder, Jim Chilcott and Nick Payne.

Review 3: 'Prevention of type 2 diabetes: interventions to raise awareness in health professionals and assist identification of high-risk groups' was carried out by ScHARR Public Health Collaborating Centre. The principal authors were: Maxine Johnson, Emma Everson-Hock, Roy Jones, Helen Buckley Woods, Suzy Paisley, Elizabeth Goyder, Jim Chilcott and Nick Payne.

Review 4: 'Interventions for the prevention of pre-diabetes in high-risk groups: examples of current practice in relation to the UK evidence base' was carried out by ScHARR Public Health Collaborating Centre. The principal authors were: Roy Jones, Maxine Johnson, Emma Everson-Hock, Helen Buckley Woods, Liddy Goyder, Jim Chilcott and Nick Payne.

Review 5: 'Review of review-level evidence to inform the development of NICE public health guidance for the prevention of pre-diabetes among adults in high-risk groups' was carried out by Matrix Evidence. The principal authors were: Alison Martin, Theo Lorenc, Alison O’Mara, Will Parry, Joe Savage and Chris Barclay.

Review 6: 'Identification of effective community projects focused on addressing risk factors for the development of pre-diabetes in adults from black and minority ethnic groups and lower socio-economic groups' was carried out by David Leah Associates Ltd. The principal author was Mary Ryan.

Cost effectiveness

The review of economic evaluations and economic modelling 'Prevention of type 2 diabetes: preventing pre-diabetes among adults in high-risk groups. Report on cost-effectiveness evidence and methods for economic modelling' was carried out by ScHARR Public Health Collaborating Centre. The principal authors were: Mike Gillett, Alan Brennan, Laurence Blake, Nick Payne, Liddy Goyder, Helen Buckley Woods, Emma Everson-Hock, Maxine Johnson, Jim Chilcott and Monica Hernandez.

Expert testimony

Expert paper 1: 'Type 2 diabetes and pre-diabetes: diagnosis and definition' by Nick Wareham, Medical Research Council Epidemiology Unit.

Expert paper 2: 'Illness labelling and illness experience' by Mike Kelly, NICE.

Expert paper 3: 'Socio-economic status and risk factors for type 2 diabetes' by Nigel Unwin, Newcastle University.

Expert paper 4: 'Expert advice, dietary surveys and nutrition research' by Alison Tedstone, Food Standards Agency.

Expert paper 5: 'CPD and training, enabling professionals to practice effectively and confidently' by Sabina Syed, PDG Community Member.

Expert paper 6: 'BME groups, diet and risk of type 2 diabetes' by Nita Forouhi, Medical Research Council Epidemiology Unit.

Expert paper 7: 'Developing population level guidance – CVD, the Foresight report' by Klim McPherson, New College Oxford.

Expert paper 8: 'Tackling obesity' by Susan Jebb, Medical Research Council Human Nutrition Research.

Expert paper 9: 'Low income groups and behaviour change interventions' by Susan Michie, University College London.

Expert paper 10: 'Adapting health promotion interventions for BME communities' by Gina Netto, Herriot Watt University.

Expert paper 11: 'Health policy and health' by Mark Exworthy, Royal Holloway, University of London.

Expert paper 12: ‘Ismaili Nutrition Centre’ by Azmina Govindji and Aleem Sachedina, Aga Khan Health Board.

Expert paper 13: ‘Environment and physical activity’ by Steve Cummins, Queen Mary, University of London.

Expert paper 14: ‘Nutritional food labelling: current thinking and practice’ by Tim Marsh, National Heart Forum.

Expert paper 15: ‘Fiscal policy instruments to improve diet’ by Marc Suhrcke, University of East Anglia.

Appendix B Summary of the methods used to develop this guidance

Introduction

The reviews, primary research, commissioned reports and economic modelling report include full details of the methods used to select the evidence (including search strategies), assess its quality and summarise it.

The minutes of the Programme Development Group (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 at http://guidance.nice.org.uk/PHG/Wave19/6

Guidance development

The stages involved in developing public health programme guidance are outlined in the box below.

1. Draft scope released for consultation

2. Stakeholder meeting about the draft scope

3. Stakeholder comments used to revise the scope

4. Final scope and responses to comments published on website

5. Evidence reviews and economic modelling undertaken and submitted to PDG

6. PDG produces draft recommendations

7. Draft guidance (and evidence) released for consultation and for field testing

8. PDG amends recommendations

9. Final guidance published on website

10. Responses to comments 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 were used by the PDG to help develop the recommendations.

The overarching question was:

How effective and cost effective are interventions to improve the modifiable risk factors associated with pre-diabetes among black and minority ethnic groups and among lower socioeconomic groups?

The subsidiary questions were:

1. What are the most effective and cost-effective methods of raising health professionals' awareness of the groups at high risk of pre-diabetes?

2. What are the most effective and cost-effective methods of identifying communities, groups and individuals at high risk of pre-diabetes?

3. What are the most effective and cost-effective population-level interventions to prevent pre-diabetes?

4. What are the most effective and cost effective-ways of raising awareness of how to prevent pre-diabetes among high-risk groups?

5. What are the most effective and cost-effective ways of ensuring interventions are culturally sensitive and appropriate for use with communities at high risk of pre-diabetes?

6. What factors might discourage individuals, groups and communities at high risk of pre-diabetes from getting involved with preventive interventions? How might these barriers be addressed?

7. What are the most effective and cost-effective methods of helping people at high risk of pre-diabetes to improve their diet, be more physically active and manage their weight?

These questions were made more specific for each of the reviews (see reviews for further details).

Reviewing the evidence

Effectiveness reviews

Four reviews of effectiveness were conducted (reviews 1, 2, 3 and 5).

Identifying the evidence

The databases searched for each review varied and details can be found within each review (see http://guidance.nice.org.uk/PHG/Wave19/6). However, the general approach is outlined below.

The following databases were searched for reviews 1, 2 and 3 (from 1990 onwards):

- British Nursing Index
- Cumulative Index to Nursing and Allied Health Literature (CINAHL)
- Cochrane Library
- EMBASE
- Evidence for Policy and Practice Information and Co-ordinating Centre Databases (EPPI Centre Databases)
- MEDLINE
- PsycINFO
- Science Citation Index
- Social Science Citation Index.

Additional searches of the grey literature were carried out and the following websites were also searched:

- Association of Public Health Observatories (www.apho.org.uk)
- Diabetes UK (www.diabetes.org.uk)
- Joseph Rowntree Foundation (www.jrf.org.uk)
- National Library for Public Health (www.library.nhs.uk/publichealth)
- NHS Evidence (www.evidence.nhs.uk)

The following databases were searched for review 5 (from 1999 onwards):

- Applied Social Sciences Index and Abstracts (ASSIA)
- Cochrane Database of Systematic Reviews
- Cumulative Index to Nursing and Allied Health Literature (CINAHL)
- Database of Abstracts of Reviews of Effectiveness (DARE)
- Database of Promoting Health Effectiveness Reviews (DoPHER)
- Education Resources Information Centre (ERIC)
- EMBASE
- Health Management Information Consortium (HMIC)
- HTA database (in the Cochrane Library)
- MEDLINE
- PsycINFO
- Social Policy and Practice.

Other reviews

Two separate sets of research were conducted to identify and describe community-level interventions to prevent diabetes (reviews 4 and 6).

Identifying the evidence

Review 4 studied the search results from reviews 1–3. It also assessed grey literature identified via Google, the Internet search engine and via selected primary care trust (PCT) websites.

Review 6 involved searching the Internet and other networks used by managers and commissioners of community-level interventions to prevent diabetes. In addition, a referral questionnaire was sent to individuals or groups identified during the searches.

Selection criteria

Inclusion and exclusion criteria for each review varied. Details can be found within each review (see http://guidance.nice.org.uk/PHG/Wave19/6). However, in general, the following applied.

Effectiveness reviews 1–3

Studies were included in reviews 1–3 if they were published since 1990 and:

- covered people at high risk of pre-diabetes
- included interventions to prevent pre-diabetes
- Included interventions to help professionals support people at high risk of developing pre-diabetes
- were conducted in the UK.

Studies were excluded if they focused on:

- people diagnosed with pre-diabetes (impaired fasting glucose/impaired glucose tolerance) or diabetes
- pregnant women, people younger than 18 or older than 74
- people taking medication that increases the risk of developing type 2 diabetes
- population-level screening
- diagnostic testing (such as clinical tests to identify pre-diabetes)
- diabetes risk assessment tools using, for example, body mass index (BMI) and waist circumference.

Effectiveness review 5

Studies were included in review 5 if they were reviews published in 1999 or later and covered:

- black and minority ethnic populations and groups from a low socioeconomic background in the UK, any other EU country, the USA, Canada, Australia or New Zealand
- a ‘general’ population (but only if the ethnicity and socioeconomic status of those included in the primary studies was systematically presented)
- people clinically diagnosed with pre-diabetes or obesity
- interventions in a range of settings to prevent pre-diabetes or type 2 diabetes (or relevant risk factors), including those aimed at reducing or preventing obesity, promoting physical activity or reducing calorie intake

- the measurement of any relevant outcome such as physical activity or dietary behaviour.

Studies were excluded if they:

- focused on those aged 0–17 years
- focused on minority ethnic groups not relevant to the UK (for example, American Indians or Australian Aboriginals)
- covered people who were clinically diagnosed with type 2 diabetes
- primarily focused on pharmacological, surgical or individual interventions (such as counselling)
- did not aim to change any of the key risk factors for pre-diabetes and type 2 diabetes
- were delivered in healthcare settings
- were not published in English.

Reviews 4 and 6

Broadly, interventions were included in review 4 if they:

- covered activities to improve diet, increase physical activity levels or raise awareness of the risk factors for pre-diabetes
- targeted adults from low socioeconomic backgrounds or from black and minority ethnic groups in the UK.

Quality appraisal

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

Study quality

++ All or most of the checklist criteria have been fulfilled. Where they have not been fulfilled, the conclusions are very unlikely to alter.

+ Some of the checklist criteria have been fulfilled. Those criteria that have not been fulfilled or not adequately described are unlikely to alter the conclusions.

– Few or no checklist criteria have been fulfilled. The conclusions of the study are likely or very likely to alter.

The evidence was also assessed for its applicability to the areas (populations, settings, interventions) covered by the scope of the guidance. Each evidence statement concludes with a statement of applicability (directly applicable, partially applicable, not applicable).

Summarising the evidence and making evidence statements

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

The findings from the reviews and expert reports were synthesised and used as the basis for a number of evidence statements relating to each key question. The evidence statements were prepared by the external contractors and public health collaborating centres (see appendix A). The statements reflect their judgement of the strength (quality, quantity and consistency) of evidence and its applicability to the populations and settings in the scope.

Cost effectiveness

There was a review of economic evaluations and an economic modelling exercise.

Review of economic evaluations

Studies were identified through the effectiveness review search strategies. The following databases were searched:

- EconLit
- NHS Economic Evaluation Database
- Public Health Interventions Cost Effectiveness Database (PHICED) (obesity and physical activity).

Previous NICE guidance on obesity and physical activity was also reviewed, as was the FORESIGHT modelling work. In addition, citation searching and reference tracking was also undertaken. The database searches followed the same inclusion and exclusion criteria as were used in the associated mapping review.

Economic modelling

A number of assumptions were made which could underestimate or overestimate the cost effectiveness of the interventions (see review modelling report for further details).

An economic model was constructed to incorporate data from the reviews of effectiveness and cost effectiveness. The results are reported in: 'Prevention of type 2 diabetes: preventing pre-diabetes among adults in high-risk groups. Report on cost-effectiveness evidence and methods for economic modelling'. It is available on NICE's website at: http://guidance.nice.org.uk/PHG/Wave19/6

Fieldwork

This section will be completed in the final document.

How the PDG formulated the recommendations

At its meetings during December 2009 to February 2011, the Programme Development Group (PDG) considered the evidence, expert reports and cost effectiveness to determine:

- whether there was sufficient evidence (in terms of strength and applicability) to form a judgement
- where relevant, whether (on balance) the evidence demonstrates that the intervention or programme/activity can be effective or is inconclusive
- where relevant, the typical size of effect (where there is one)
- whether the evidence is applicable to the target groups and context covered by the guidance.

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

- Strength (type, quality, quantity and consistency) of the evidence.
- The applicability of the evidence to the populations/settings referred to in the scope.
- Effect size and potential impact on the target population's health.
- Impact on inequalities in health between different groups of the population.
- Equality and diversity legislation.
- Ethical issues and social value judgements.
- Cost effectiveness (for the NHS and other public sector organisations).
- Balance of harms and benefits.
- Ease of implementation and any anticipated changes in practice.

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 lists the evidence statements from six reviews provided by the public health collaborating centre (see appendix A) and links them to the relevant recommendations. (See appendix B for the key to 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 lists eight expert papers and their links to the recommendations and sets out a brief summary of findings from the economic analysis.

The six reviews of effectiveness are:

- Review 1: ‘Prevention of type 2 diabetes: interventions to reduce risk factors for pre-diabetes among UK adults from a lower socioeconomic group’
- Review 2: ‘Prevention of type 2 diabetes: interventions to reduce risk factors for pre-diabetes among UK adults from black and minority ethnic groups’
- Review 3: ‘Prevention of type 2 diabetes: interventions to raise awareness in health professionals and assist identification of high-risk groups’
- Review 4: ‘Interventions for the prevention of pre-diabetes in high-risk groups: examples of current practice in relation to the UK evidence base’
- Review 5: ‘Review of review-level evidence to inform the development of NICE public health guidance for the prevention of pre-diabetes among adults in high-risk groups’
- Review 6: ‘Identification of effective community projects focused on addressing risk factors for the development of pre-diabetes in adults from black and minority ethnic groups and lower socio-economic groups’.

Evidence statement number 1.1a indicates that the linked statement is numbered **1a** in review **1**. **Evidence statement number 3.1** indicates that the

linked statement is numbered **1** in review **3**. **EP1** indicates that expert paper **1** is linked to the recommendation.

The reviews, expert reports and economic analysis are available at http://guidance.nice.org.uk/PHG/Wave19/6 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).

Where the Programme Development Group (PDG) has considered other evidence, it is linked to the appropriate recommendation below. It is also listed in the additional evidence section of this appendix.

Recommendation 1: evidence statements 1.21a, 1.21b, 1.29, 2.5; EP9, EP10, EP13

Recommendation 2: evidence statements 1.21b, 1.29, 2.7b, 3.2, 3.6, 3.8; EP13

Recommendation 3: evidence statements 1.21a, 1.21d, 1.25, 2.4, 2.5, 2.6, 2.7a, 2.7b, 2.7c, 2.10, 3.7, 3.8; EP6, EP8, EP9, EP10

Recommendation 4: evidence statements 1.5, 1.21a, 1.21b, 1.21c, 1.22, 2.3, 2.9a, 3.6, 3.7, 3.8; EP8, EP9, EP10; additional evidence NICE (2006); IDE

Recommendation 5: evidence statements 1.5, 1.7, 1.21b, 1.22, 1.28, 1.29, 2.8; EP8, EP10, EP15; additional evidence NICE (2006); IDE

Recommendation 6: evidence statements 1.21b, 1.21d, 1.27, 1.28, 1.29, 2.3, 2.4, 2.8, 2.9b EP8, EP15; additional evidence NICE (2006)

Recommendation 7: evidence statements 3.2, 3.3, 3.4; EP5

Recommendation 8: evidence statements 1.21b; EP7, EP8, EP11, EP12, EP14, EP15; IDE

Recommendation 9: evidence statements 1.27, 2.5, 2.7b, 2.9b; EP13

Evidence statements

Please note that the wording of some evidence statements has been altered slightly from those in the evidence review(s) to make them more consistent with each other and NICE's standard house style.

Evidence statement 1.5

Evidence of mixed effectiveness was found in relation to nutrition knowledge. One poor quality case series (-) found that a 10-week programme focused on translating dietary recommendations into practice, including guided hands-on food preparation, led to an increase in nutrition knowledge in two of the four intervention groups studied. No significant increase in nutrition knowledge was found in the other two groups.

Evidence statement 1.7

Evidence of mixed effectiveness was found in relation to fruit and vegetable intake. One reasonable quality prospective cohort study (+) found an overall increase in overall average fruit and vegetable consumption in both the community where a new food hypermarket had opened and the comparison community with no new hypermarket over 12 months. There was however no significant change in either groups in average fruit consumption, and an increase in only the comparison community in vegetable consumption. One poor quality case series (-) examining the impact of the introduction of a new large-scale food retail outlet over a 1-year period found an increase in fruit and vegetable consumption among those who switched to the new store, but not among those who did not. Among both switchers and non-switchers, those with low pre-intervention levels significantly increased their fruit and vegetable consumption.

Evidence statement 1.21a

There is evidence that information is more accessible and interventions more acceptable where key workers possess the appropriate knowledge, skills and personal attributes, such as empathy and trustworthiness.

One (+) evaluation found that trained lay workers were able to access and raise awareness in hard-to-reach groups through their knowledge of the community in which they were working, and their personal communication skills. Attributes of workers were found to be influential in three (all [+]) evaluations on the success of interventions. Other (four [+]) evaluations found that the skills of an intervention adviser facilitated the feeling of empowerment among participants, and that skills were learned through engaging the interest of the participants. As well as disseminating information in a meaningful way.

Evidence statement 1.21b

Three (all [+]) evaluations of included intervention studies found evidence that acceptability is increased when practical demonstrations make abstract concepts and scientific language more meaningful, and when progressive small steps are taken in terms of behaviour change.

Two (both [+]) evaluations reported suggestions made by participants that might increase acceptability. These were: the development of women-only classes and more activities at weekends to fit in with other commitments; free sessions, free childcare (especially in school holidays), free food, individual and group tailored recipes and useful enjoyable activities.

In one (+) evaluation there was evidence that male-only classes using creative ways to conceptualise weight management increased acceptability and motivation.

One exploratory study and one evaluation (both [+]) found that acceptability of a food educational intervention was increased by first exploring participants' needs in terms of topic content. Three evaluations (two [+] and one [++]) found that incentives such as access to free food increased motivation to participate in nutrition educational interventions. The experimental use of familiar and affordable food increased the acceptability of a food and health project.

There was evidence (one [+]) that interventions delivered by community members rather than health professionals tended to encourage community participation and meet local needs with an open and holistic agenda.

Evidence statement 1.21c

There is evidence that acceptability of interventions that aim to change behaviour is enhanced by the added value of social inclusion. Social interaction has a positive subjective effect on wellbeing as well as providing a shared forum for discussion of concerns.

Evaluation of a healthy living centre (one [++]) found that social inclusion was stated as one aim of the intervention, while another randomised controlled trial (RCT) qualitative evaluation (+) found that interactive Internet portals increased social capital for people with shared health issues. Social interaction was a positive and facilitating factor for participation in four interventions (all [+]) aimed at increasing physical activity, and one aimed at improving eating behaviours. Positive social aspects of the interventions included an informal atmosphere, the opportunity to chat and discuss with other participants, as well as humour.

Evidence statement 1.21d

There is evidence that interventions aimed at raising awareness of healthy behaviours are more acceptable when they are made appropriate to the target audience and have a positive image.

One (++) qualitative study found that young women will be less motivated to participate in sporting activities if the image associated with those activities, for example the required clothing, is perceived as negative. Two process evaluations found that participants held negative associations with the term ‘healthy eating’. The group in one (++) study associated the term with government policy and the other (+) study group regarded healthy eating as boring and not filling.

Evidence statement 1.22

There was qualitative evidence from two (both [+]) multi-method evaluations of changes in participants' and their family's eating behaviour, and also of a developing interest in cooking as well as increased feelings of wellbeing. In one of these evaluations, the use of fat in cooking had reduced.

Evidence statement 1.25

There is evidence that adopting healthy lifestyle behaviours can be influenced by existing attitudes toward health. One (++) qualitative study found evidence of a range of attitudes from actively seeking to improve health prospects to a disinterest in health issues. Another (+) interview and focus group study found a perceived lack of control over weight. Two rationales for excess weight included a flawed metabolism and genetics, neither of which were perceived as subject to change. There was evidence from one (+) interview study that for the mothers in the study, the five-a-day message was perceived as impractical and a joke. One focus group study (+) found that lack of exercise was generally not emphasised as a health risk factor by male and female blue collar workers. In another focus group study (+), women of lower educational attainment were not clear about the links between food and health, often equating weight with health, and believed it was not good to be 'too healthy', although the long-term health of their children was considered important and related to food. Another focus group study (+) found that some mothers deliberately sought out cheap and healthy foods, however others were less concerned about the healthiness of their family meals.

Evidence statement 1.27

There is evidence that adopting healthy lifestyle behaviours can be influenced by current lifestyle. Two evaluations (both [+]) and one (+) interview and focus group study found evidence that commitments and responsibilities were seen as a barrier to participation in physical activity. There was also evidence that for some, existing activity around the home is sufficient. Participants cited lack of time, particularly if employed in work or looking after children, as a barrier to physical activity. There was evidence from one (+) qualitative study that parents regard 'stress', 'comfort eating' 'being stuck in a rut' and

‘embarrassment’ as reasons for not carrying out sufficient physical activity. Health professionals interviewed in the same study discussed the prevalence of mental health issues such as depression in the area, and its impact on health behaviours.

Evidence statement 1.28

There is mixed evidence that affordability has an impact on lifestyle behaviour change. One (+) qualitative study found that costs limited the extent to which deprived mothers could buy healthy food. Another (+) qualitative study exploring the beliefs of those living in new deal communities (NDCs) found a perceived lack of affordable goods in the local area, with public transport costs also regarded as prohibitive. Affordability in two studies was only an issue where buying extra food, or organic food might be considered. One (+) evaluation and one (++) qualitative study found that cooking different meals to suit the preferences of family members was considered too expensive. In one (+) evaluation there was evidence that low-income groups were resistant to change because of financial risk. In one (+) interview study with low income consumers and health professionals, both stated that pricing strategies were not regarded as helpful in encouraging healthy eating. However, health professionals held the view that healthy foods could be prioritised over convenience foods when shopping. One focus group study (+) identified the cost of food as a barrier to healthy eating due to its cost in relation to other priorities, marketing strategies and special offers not being placed on healthier foods and the waste generated by buying food that did not get eaten. Similarly, another focus group study (+) found that mothers would choose less healthy but cheaper options when shopping and wasting money on food that their families would not eat was a consideration. Expense was also reported by men as a barrier to healthy eating in another focus group study (++), although the authors did not explore this in detail.

There is evidence (one [+] study) that affordability may be addressed by including budgeting as a topic in nutrition educational programmes. Evidence from one (+) interview study showed cost as a perceived barrier to physical activity in disadvantaged groups for both consumers and health professionals.

Transport to – and use of – facilities were both perceived as costly. Physical activity referral schemes were suggested as one way of overcoming .the cost of using facilities.

Evidence statement 1.29

Evidence was found that environmental factors can be a barrier to improving nutrition. One (+) qualitative study found that a perceived lack of local amenities was a prohibiting factor in shopping for healthy foods. Access to food shopping was regarded as a barrier to healthy eating among women with lower educational attainment in one focus group study (+), in particular navigating round shops with pushchairs, coping with demanding children and bringing the shopping home on public transport and into high-rise flats. Evidence was also found that environmental factors can be a barrier to change in take-up of physical activity. One (++) qualitative evaluation found that fear of crime and feeling intimidated inhibited the motivation to participate in a new cycling initiative. One (+) qualitative study found that fear of attack prevented walking in certain areas. Another (+) evaluation showed that dark evenings and poor weather are barriers to physical exercise outdoors. One large-scale cross-sectional survey (+) found that active travel was associated with being younger, living in owner-occupied accommodation, travelling less than 4 miles to work, having access to a bicycle and not having access to a car, whereas overall physical activity was associated with living in social-rented accommodation and not being overweight.

Evidence statement 2.3

There was evidence from one (+) focus group study that acceptability of lifestyle change interventions can be increased by raising the cultural sensitivity of delivery. For example, the importance of avoiding Ramadan needs to be considered in the timing of delivery, and separate sessions for men and women need to be considered. There was evidence that flexibility around the timing of interventions as well as the bilingual abilities of staff were important. Learning to cook traditional foods in a more healthy way was one way to preserve cultural identity. In addition, advice (particularly one-to-one)

and information that takes into account literacy levels and is encouraging were crucial to sustaining motivation to adopt a healthier lifestyle.

Evidence from one (++) focus group study that included suggestions from participants, showed that acceptability of a nutritional education intervention might be increased by: including free food, timing classes to suit those with childcare responsibilities, and providing a crèche or possibly holding the classes in schools. Evidence from one (+) needs assessment study showed that cook and eat sessions and weight management classes that were made freely available on a gypsy traveller site were valued by women residents for their non-threatening environment and as a forum for discussion of health issues – as well as a way to reduce social isolation. Lack of childcare facilities, transport issues and costs were barriers to off-site activity.

Evidence from an interview-guided questionnaire study (+) and one qualitative evaluation (+) included suggestions to increase the acceptability for Muslim Bangladeshi women who may wish to access a gym. Suggestions included the provision of women-only facilities, women-only sessions, swimming facilities for women, more walking physical activity facilities, fewer aerobic classes, Sylheti-speaking assistants, better transport and childcare facilities, less loud music, no inappropriate TV programmes and provocative music videos, and access to more local gyms. Evidence from one qualitative evaluation (+) of exercise on prescription (EoP) also identified lack of access to facilities, lack of childcare arrangements, as well as a limited choice of women-only sessions as barriers to attendance.

There was evidence from one (+) mixed method study that social interaction was a motivator for South Asian women attending a healthy eating and physical activity group. Some women also stated that they ate less when attending as they were not tempted to snack in the same way as when they stayed in the house.

Evidence statement 2.4

There was evidence from one (++) focus group study of lack of understanding between professional and lay groups in terms of Islamic teaching and its

relation to healthy lifestyle practices. There was also evidence from the same study of communication difficulties arising from health literacy deficiencies in lay Bangladeshi people and cultural sensitivity deficiencies in professionals which obstruct appropriate health promotion messages.

Evidence statement 2.5

There was evidence from four focus groups and two interview studies that religious customs can become barriers or facilitators to lifestyle change. Change was more likely where participants believed they had some degree of free will. There was conflicting evidence regarding fatalism; in one (++) study health professionals spoke of fatalism as a barrier to health prevention in some black and minority ethnic groups. However, evidence from one (+) study suggests that while the occurrence of health conditions might be regarded as God's will, it is also, according to teachings, the responsibility of the individual to attempt to maintain good health and wellbeing.

There was evidence from three focus groups (one [++] and two [+]) and one (+) interview study and one qualitative evaluation (+) that healthy activities were acceptable provided they did not include aspects that were conflicting with religious teachings. One (++) focus group study showed evidence that some practices, such as eating Halal meat could limit the use of fast-food outlets.

Evidence statement 2.6

There was evidence from nine qualitative studies that cultural influences and issues of identity can be barriers or facilitators to lifestyle change.

There is evidence from one (+) focus group study that a nomadic identity influenced dietary choices for Somalians. As descendants of camel herders, diet in the UK continued to be influenced by the staple diet of meat with rice or spaghetti and a low consumption of fruit and vegetables which were less valued.

A (+) needs assessment with gypsy travellers found that some fruit and vegetables were eaten daily, as they were seen as relatively cheap. In

particular, vegetables were favoured as they could be incorporated into daily cooking. However, while 60% of participants considered themselves as 'heavy', they also stated that the meal was often followed by a take-away in the evening.

Evidence from one (+) interview study suggested that traditional South Asian beliefs regarding the preventive attributes of certain vegetables in terms of ill health are part of a cultural identity, and that this might be taken on board by professionals when discussing health promotion. Dietary practices in the UK can involve experiences that are alien to traditional culture and identity However, one (+) qualitative study showed that food choices made by South Asian women can be informed by both traditional ('our' food) and Western ('your sort of foods') explanations in terms of 'good' and 'bad' effects upon the body so long as such explanations are complementary rather than in conflict.

Evidence was found in one (+) guided interview study, one (+) focus group study and one (+) needs assessment for differences between UK culture and non-Western culture in terms of the perception of physical activity as either 'separate' or 'integral' to daily routine. Physical activity as 'separate' incurred financial costs as well as often being organised in ways that are insensitive to different cultural values.

Evidence from one (+) study highlighted the belief that expending sweat is important for increased wellbeing; this influenced the practices that might be taken up in the UK where a cold climate limits sweat production.

There was evidence from one (+) guided interview study and two (one [+] and one [++]) focus group studies and one qualitative evaluation (+) that a limited command of the English language is a barrier to accessing information, as well as accessing activities and shopping facilities outside of the individual's neighbourhood.

There was evidence from one (+) interview study that some South Asians consider that nothing can be done to prevent diabetes if there is already a family history.

Evidence statement 2.7a

There was evidence from three (two [++] and one [+]) focus group studies that knowledge regarding risk factors is high in South Asian communities. However, evidence from one (+) focus group study of predominantly male Somali participants suggested a low level of knowledge. When knowledge levels were high, there was evidence from two (one [++] and one [+]) focus group studies that this does not always translate to practice in terms of healthy lifestyle. Evidence from one (++) focus group study suggested that education may be one way of overcoming restrictive practices.

Evidence statement 2.7b

Evidence from one (+) focus group study suggested that South Asian people in the UK would appreciate increased information on risk factors, advice and encouragement in order to motivate and sustain behaviour change.

There was evidence from one (+) focus group study that information and advice regarding physical activity came mainly from the media, role models, family and friends, the medical establishment (mainly hospitals) and to a limited degree, fitness campaigns.

Evidence statement 2.7c

There was evidence from one guided interview study and two focus group studies (one [++] and two [+]) and one qualitative evaluation (+) that a limited command of the English language is a barrier to accessing information, as well as activities and shopping facilities outside the neighbourhood.

Evidence statement 2.8

For South Asian and African populations in the UK, and especially first generation migrants, there was evidence from three (two [++] and one [+]) focus group studies that traditional fresh foods are not readily available locally and are expensive.

Evidence from one (++) focus group study showed that older people are less willing to travel beyond the immediate neighbourhood for food due to

language barriers and fears for their safety. There is evidence from one (++) focus group study that the price of food is more of an issue for older people.

There was evidence from one (+) mixed method evaluation and one qualitative evaluation (+) that: distance from physical activities, lack of transport, fear of walking alone, having conflicting family commitments, not being able or willing to walk, ill health and cold weather were all barriers to attending a healthy eating and physical activity group. Having to travel to venues incurred extra costs even if physical exercise was on prescription, as for some South Asian women even a small financial contribution was reported as a barrier.

Evidence statement 2.9a

There was evidence from four (two [+] and two [++]) focus group studies that traditional South Asian cooking is associated with a high usage of fat, particularly for special occasions (which occur frequently) and that there is resistance to change such traditions. Indian men who wished to control their diet within a close-knit community where social events were common found it particularly difficult.

Evidence from one (+) focus group study showed that Somali cooking is associated with high meat and low fruit and vegetable content and again there is resistance to change. These traditions are part of the cultural identity and symbolic of prosperity and hospitality.

Evidence from two focus (one [++] and one [+]) group studies suggested that consumption of take-away food is common in second generation South Asian males and females as a change from traditional fare. Similarly, take-away meals were commonly used by Somalian males, particularly those living alone.

Some South Asian women are beginning to cook in more healthy ways. There were suggestions from one (+) focus group study that learning to cook traditional food in healthy ways may be beneficial to South Asian groups. Another focus group study (++) suggested that women from Zimbabwe were

not used to cooking for themselves as in Africa, maids had done the cooking; having to cook in the UK was seen as time consuming.

Evidence statement 2.9b

There was evidence from two (both [+]) interviews and four (one [++] and three [+]) focus group studies and one qualitative evaluation (+) that in South Asian groups, physical activity was perceived as a part of normal life and that there was little time for formal or 'separate' sessions, due to work or childcare commitments.

In particular, evidence from one (++) focus group study suggested women were expected to stay home and look after children rather than enrol the help of others. Evidence from one (+) interview study suggested that older participants perceived that vigorous physical activity was unnecessary in the context of advancing age and that keeping active and mobile was preferable.

There was evidence from one (+) focus group study of variation in views of South Asian and black participants regarding the appropriate level of physical activity required to obtain benefits, depending on own level of activity. There was evidence from the same study among South Asian participants that partaking in physical activity could compensate for unhealthy eating or smoking.

Evidence from two interview studies (both [+]), three focus group (one [++] and two [+]) studies and one qualitative evaluation (+) suggests that vigorous activity such as aerobics was not acceptable to some South Asian participants, particularly females, for whom modesty and single-sex classes were important considerations. One (+) focus group study found that for some young people, however, going to the gym created a means of filling time, escape from social conditions and keeping up with fashion trends. There was evidence from one (+) focus group study of South Asian participants that partaking in physical activity could compensate for unhealthy eating or smoking.

There was also evidence from one (+) focus group study that encouraging sweating was important to some South Asians. Evidence from one (+) focus group study and one guided interview study suggested that swimming and slow walking were preferred ways to remain active.

There is evidence from one (++) focus group study of a 'complex value hierarchy'. For example, choosing healthier options such as using less fat in cooking, and having to wear certain clothing for particular physical activities were seen as shameful and as more important than the benefits of a healthy lifestyle. In addition, as in white communities, support from families can act as a facilitator (if the new behaviour is integrated with the sense of self and one's own values without the control of others) or a barrier to changing health-related behaviours.

Evidence statement 2.10

There was evidence from five good quality (two [++] and three [+]) qualitative studies (three focus group and two interview studies) that body image expectations vary according to background and culture and often differ from those currently popular within the UK.

There is evidence from one (++) focus group study that body size can be positively or negatively associated with health and attractiveness, and attempting to reach an ideal body size can be a strong motivator for behaviour change. There was evidence from one (+) interview guided questionnaire that only 64% of overweight or obese Bangladeshi women classed themselves as overweight. There was evidence from one (+) interview study that weight management was more important for South Asian males than females, and a (+) focus group study found it important for young South Asian and black females.

Evidence was found for an association between being overweight and prosperity in one (+) focus group study with Indian, Pakistani and Indian participants. Changing dietary and physical activity patterns in old age was perceived as potentially weakening.

Having the ‘right’ body size was influenced by the media as well as some male views, and was important for attracting a partner for young South Asian and black females in one (+) focus group study.

In one (++) focus group study body size was found to be a stronger motivator for healthy behaviour changes than health issues.

Evidence statement 3.2

There is evidence from one (+) study that did not focus on low income or BME groups to suggest that the process of identifying and referring high-risk patients in primary care to an exercise scheme varies between general practices. GPs and practice nurse's methods of identifying and referring patients to an exercise scheme was ad-hoc and based on: patients asking about exercise themselves, chance discussion during consultations, requests for referral by another doctor, and asking patients to choose from a variety of behaviour change activities that might produce health benefits.

Evidence from one (+) evaluation of healthy living centres acknowledges the challenges of identifying groups at risk. Hard-to-reach groups might be reached in small numbers at community events or eventually be motivated to engage with initiatives through word of mouth from relatives.

Evidence statement 3.3

Evidence from one (+) survey study that evaluated the contribution of nurses to targeting health and social need suggests that in order to be able to empower high-risk groups to make choices about adopting healthy lifestyles, health professionals require a deep understanding of the cultural and religious beliefs and economic influences within the communities with which they are working.

One (+) evaluation highlighted the need for practitioners to take into account the realities of the people they are targeting. For example, making it clear that low-income groups do not require expensive clothing to engage in a community physical activity initiative.

Evidence statement 3.4

Evidence from one (+) qualitative study of nurses' attitudes identified two discourses in relation to health promotion with disadvantaged groups. One was associated with the philosophy of holism that nurses were exposed to during training, resulting in empathy for the disadvantages that low-income groups face in attempting to achieve a healthy lifestyle. The other discourse reflects personal values, and beliefs that individuals must take responsibility for their own health. This tension may need addressing when practising health promotion in a culturally sensitive way.

Evidence statement 3.6

Evidence from two evaluations (one [+] and one [++]) suggests that the training of lay workers to identify and disseminate health promotion messages to members of their community is a way of reaching hard-to-reach and high-risk groups.

One (+) evaluation in which 11 women (seven of Pakistani, two of Indian and two of Chinese origin; of Muslim, Hindu and Christian religious backgrounds) undertook formal training to become community health workers (CHWs) provides evidence that lay workers trained by health professionals can identify target groups within the community and deliver health messages in a culturally sensitive way in an appropriate language. Knowledge of the communication channels in a community assisted in the success of the initiative. For example, in this study, younger women were targeted for training as they are relied upon in the community for passing on information.

Evidence from a qualitative evaluation (++) study that explores the role of the lay food and health worker suggests a consensus of opinion that the primary role for lay workers is the encouragement of dietary change by making complex messages more credible and culturally appropriate. A proactive strategy for lay workers to identify and contact at-risk individuals is to create lists of contacts within the community and introduce themselves to those on the list.

One (+) evaluation of healthy living centres highlighted a difference in focus between lay workers, who considered the larger social picture, and health professionals, whose focus was more on outcomes such as improved fruit and vegetable intake.

Evidence statement 3.7

One (-) evaluation of peer education training as part of a community health promotion programme (Project Dil), provides evidence of a high level of uptake and enthusiasm from those engaged in peer education. The project was designed to improve the effectiveness of primary and secondary prevention of coronary heart disease in volunteer Leicestershire general practices with a high percentage of South Asian patients. Peer education was reported to facilitate health promotion within a range of organised community events.

Evidence from one (+) evaluation suggests that fostering a team spirit and sharing experiences was a key facilitator in training lay workers. However, there is evidence from the same study that scheduled activities prevented lay workers from having time to participate.

Evidence statement 3.8

One (+) evaluation of lay worker training provides evidence that target groups within the community increased their knowledge as a result of lay worker activity, and found the cultural sensitivity of health promotion messages an important factor in helping to make changes in dietary practice.

Expert papers

Expert paper 5: 'CPD and training, enabling professionals to practice effectively and confidently'.

Expert paper 6: 'BME groups, diet and risk of type 2 diabetes'.

Expert paper 7: ‘Developing population level guidance – CVD, the Foresight Report.’

Expert paper 8: 'Tackling obesity'.

Expert paper 9: 'Low income groups and behaviour change interventions'.

Expert paper 10: 'Adapting health promotion interventions for BME communities'.

Expert paper 11: 'Health policy and health.'

Expert paper 12: ‘Ismaili Nutrition Centre’.

Expert paper 13: ‘Environment and physical activity’.

Expert paper 14: ‘Nutritional food labelling current thinking and practice’.

Expert paper 15: ‘Fiscal policy instruments to improve diet’.

Additional evidence

NICE clinical guideline 43 (2006) Obesity. Available from www.nice.org.uk/guidance/CG43

Cost-effectiveness evidence

The recommended interventions operate on groups of people – and often quite large groups. For most people, the amount of weight they lose, the extent of changes to their diet and any increase in the amount of exercise they take will be relatively small. In addition, a few will make changes in the wrong direction. Thus the average changes in behaviour within the group as a whole will usually be small. However, the total changes will eventually be discernable at a population level: that is, fewer people will be diagnosed with diabetes in the long run, or will be diagnosed later in life.

Modelling over the lifetime of individuals demonstrates that, if the total costs of undertaking the initial interventions are sufficiently small, these interventions will be cost effective. Some interventions will be very cost effective or, in the long run, cost saving, even after discounting future benefits at the usual rate of 3.5% per year. (‘Cost saving’ means that the costs saved from not having to undertake treatment later in life exceed the costs of the intervention.)

However, for a range of reasons, there is an element of uncertainty in the modelling results. This includes the possibility that better health outcomes in the future may be attributable to something other than the named interventions, or that there might be far better and cheaper treatments for diabetes in the future.

Appendix D Gaps in the evidence

The Programme Development Group (PDG) identified a number of gaps in the evidence related to the programmes under examination, based on an assessment of the evidence and expert comment. These gaps are set out below.

1. There was not enough evidence to judge the effectiveness of interventions to reduce the risk of – and prevent – pre-diabetes. In particular, there was a lack of evidence on how effective they are with people from black and minority ethnic and lower socioeconomic communities in the UK.

   (**Source** Reviews 1–3 and 5)

2. There was limited evidence on how different approaches could be combined. (For example, targeting the population as whole, targeting 'high-risk' populations and other approaches, including 'individual' interventions.)

   (**Source** Reviews 1–3 and 5)

3. There was limited evidence on the 'cultural appropriateness' of interventions and how they could be effectively adapted or tailored to prevent pre-diabetes.

   (**Source** Reviews 1–6; Expert paper 10)

4. There was limited evidence on how the environment in which people live may affect their risk of developing pre-diabetes.

   (**Source** Reviews 1 and 2; Expert paper 13)

5. There was limited evidence on the effectiveness of interventions to develop the awareness, knowledge, understanding and skills of healthcare professionals and others responsible for people at high risk of developing pre-diabetes.

(**Source** Review 3)

6. There was limited evidence on the potentially regressive effects of food taxation on health inequalities.

   (**Source** Expert paper 15)

Appendix E Supporting documents

Supporting documents are available at http://guidance.nice.org.uk/PHG/Wave19/6 These include the following.

Evidence reviews:

- Review 1: ‘Prevention of type 2 diabetes: interventions to reduce risk factors for pre-diabetes among UK adults from a lower socioeconomic group’
- Review 2: ‘Prevention of type 2 diabetes: interventions to reduce risk factors for pre-diabetes among UK adults from black and minority ethnic groups’
- Review 3: ‘Prevention of type 2 diabetes: interventions to raise awareness in health professionals and assist identification of high-risk groups’
- Review 4: ‘Interventions for the prevention of pre-diabetes in high-risk groups: examples of current practice in relation to the UK evidence base’
- Review 5: 'Review of review-level evidence to inform the development of NICE public health guidance for the prevention of pre-diabetes among adults in high-risk groups’
- Review 6: 'Identification of effective community projects focused on addressing risk factors for the development of pre-diabetes in adults from black and minority ethnic groups and lower socio-economic groups’.

Economic modelling:

- ‘Prevention of type 2 diabetes: preventing pre-diabetes among adults in high-risk groups. Report on cost-effectiveness evidence and methods for economic modelling’.

Expert papers:

- Expert paper 1: 'Type 2 diabetes and pre-diabetes: diagnosis and definition'

- Expert paper 2: 'Illness labelling and illness experience'
- Expert paper 3: 'Socio-economic status and risk factors for type 2 diabetes'
- Expert paper 4: 'Expert advice, dietary surveys and nutrition research'
- Expert paper 5: 'CPD and training, enabling professionals to practice effectively and confidently'
- Expert paper 6: 'BME groups, diet and risk of type 2 diabetes'
- Expert paper 7: 'Developing population level guidance – CVD, the Foresight report'
- Expert paper 8: 'Tacking obesity'
- Expert paper 9: 'Low income groups and behaviour change interventions'
- Expert paper 10: 'Adapting health promotion interventions for BME communities'
- Expert paper 11: 'Health policy and health'
- Expert paper 12: ‘Ismaili Nutrition Centre’
- Expert paper 13: ‘Environment and physical activity’
- Expert paper 14: ‘Nutritional food labelling: current thinking and practice’
- Expert paper 15: ‘Fiscal policy instruments to improve diet’.

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

- ‘Methods for development of NICE public health guidance (second edition, 2009)’ available from www.nice.org.uk/phmethods
- ‘The NICE public health guidance development process: An overview for stakeholders including public health practitioners, policy makers and the public (second edition, 2009)’ available from www.nice.org.uk/phprocess