Assessing body mass index and waist circumference thresholds for intervening to prevent ill health and premature death among adults from black, Asian and other minority ethnic groups in the UK

1 Introduction

In July 2011, NICE received a referral from the Department of Health on assessing body mass index (BMI) and waist circumference among adults from black, Asian and other minority ethnic groups in the UK and how they link to being overweight or obese. The aim was to determine whether different BMI and waist circumference measures should be used as a trigger for health promotion and prevention advice for people in these groups, compared with the measures used for the white population.

Only lifestyle interventions to prevent people becoming overweight or obese were considered. The guidance did not consider thresholds for clinical interventions.

2 Process

Evidence relating to the following research question was considered by the Public Health Interventions Advisory Committee (PHIAC) in October 2012:

- What are the cut-off points for BMI and waist circumference among adults from black, Asian and other minority ethnic groups living in the UK that are ‘risk equivalent’ to the current thresholds set for white European populations?

A detailed description of the development process is provided in appendix B, a list of PHIAC members is provided in appendix D and additional information and supporting documentation is provided in appendix E.

3 Summary of the evidence

The evidence review ‘Body mass index and waist circumference thresholds for intervening to prevent ill health among black, Asian and other minority ethnic groups'.
in the UK’ suggests that black, Asian and other minority ethnic groups are at a higher risk of diabetes than white populations with the same body mass index (BMI) and waist circumference values.

Limited evidence suggests that a BMI threshold of 23 kg/m² in black and Chinese populations may be approximately equivalent to an overweight cut-off point of 25 kg/m² in white European populations. Limited evidence also suggests that a BMI of 24 kg/m² among South Asian and Chinese populations, and 26 kg/m² for black populations, may be approximately equivalent to an obesity cut-off point of 30 kg/m² in white European populations. Both measures indicate a risk of diabetes.

Significant gaps in the evidence were found.

Very few studies (mainly from the US and Canada) directly compared the association between BMI and the risk of type 2 diabetes in people of different ethnic groups. No large published prospective studies were identified that compared white populations to black, Asian or other minority ethnic groups resident in the UK.

In addition, no suitable studies were identified for Middle Eastern populations. Few studies included health outcomes other than diabetes – such as stroke, myocardial infarction or mortality – or waist circumference as an independent variable.

For details see appendix C.

4 Public Health Interventions Advisory Committee discussions and conclusions

When considering the evidence review, the Public Health Interventions Advisory Committee (PHIAC) took account of a number of issues, as follows.

4.1 Evidence suggests that people from black, Asian and other minority ethnic groups are at an equivalent risk of diabetes and other health conditions at a lower body mass index (BMI) than white populations. However, they are not necessarily receiving health promotion advice at this earlier stage.

PHIAC noted that this may create a significant health inequality.

Nevertheless, the Committee considered that the evidence was
insufficient to justify the development of new BMI or waist circumference thresholds for black, Asian or other ethnic minority groups in England.

4.2 PHIAC noted that 6 of the 8 studies included in the review were considered in NICE’s obesity guideline, published in 2006. This guideline did not make a recommendation on specific BMI and waist circumference cut-off points for different minority ethnic groups. However, it did note that: ‘…some other population groups, such as Asians and older people, have comorbidity risk factors that would be of concern at different BMIs (lower for Asian adults and higher for older people). Healthcare professionals should use clinical judgement when considering risk factors in these groups, even in people not classified as overweight or obese using the classification in recommendation 1.2.2.7.’ PHIAC considered that the evidence accumulated since 2006 is still insufficient to make specific recommendations about BMI and waist circumference thresholds in these populations.

4.3 Some studies included in the evidence review used self-reported measures of waist circumference, BMI and health outcomes (for example, on diabetes). This may have introduced measurement error and bias.

4.4 The relationship between ethnicity and obesity is complex and not all studies were adjusted for the same potentially confounding factors.

4.5 Some of the equivalence thresholds discussed by PHIAC were derived post-hoc by the evidence reviewers. This is likely to be imprecise. In addition, any estimate of equivalence will include a degree of uncertainty, irrespective of the method used.

4.6 PHIAC recognised that ongoing UK studies may provide evidence on BMI thresholds in the future. These include the ‘Southall and Brent revisited’ (SABRE) cohort and the Leicester cohort of the ‘Anglo-Danish-Dutch study of intensive treatment in people with screen detected diabetes in primary care’ (ADDITION). This evidence should be available by the post-consultation PHIAC meeting in March 2013.
4.7 PHIAC did not consider evidence on the effectiveness or cost effectiveness of intervening at different threshold levels on BMI and waist circumference for different black, Asian and other minority ethnic groups. This was not part of the scope of the guidance.

4.8 PHIAC noted that evidence of ‘equivalence of risk’ and the need to intervene at a lower BMI may not be the same as evidence on ‘equivalence of response’ to interventions. In other words, people from black, Asian and other minority ethnic groups may have the same risk of mortality and diabetes at a lower BMI, compared to white populations. However, they may not respond in the same way to behaviour change interventions as white populations. Or, if they do lose weight, they may not gain the same benefit from a similar reduction in weight as someone who is white. The evidence considered by PHIAC did not allow for a prediction of response to behavioural interventions.

4.9 Potential disbenefits of a lower BMI or waist circumference threshold include the fact that someone might be labelled, stigmatised or, in some other way, harmed psychologically. The situation may be made worse if being treated earlier offers them negligible benefit. However, PHIAC noted that if people are at equivalent risk at a lower BMI, then the benefits of offering earlier behavioural support are likely to outweigh any ill effects.

4.10 Patient notes do not always include BMI or waist circumference measures. Waist circumference, in particular, is rarely noted by GPs. In addition, information on ethnicity is often not recorded.

4.11 Health professionals may be unaware of the disproportionate risks and burden of disease associated with being overweight or obese and being part of a black, Asian or other minority ethnic group.

4.12 PHIAC noted that there are recognised differences in terms of health outcomes within ethnic groups and it is important to note that these groups are not homogeneous (Nazroo 2004).
4.13 When the draft NICE guidance was produced, PHIAC did not wish to endorse any existing guidance on BMI and waist circumference thresholds. However, the Committee noted that a number of international organisations have published BMI or waist circumference thresholds that may be relevant to black, Asian and other minority ethnic groups in the UK (see box 1 below).

4.14 Other approaches to anthropometric measurement, such as waist-to-hip and waist-to-height ratio, were not assessed. This should not be taken as a judgement on whether or not these approaches are effective.
Box 1: International guidance on BMI/waist circumference thresholds

**WHO guidance** on BMI thresholds for Asian populations (World Health Organization 2004)

<table>
<thead>
<tr>
<th>White European populations</th>
<th>Asian populations</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 18.5 kg/m²</td>
<td>Less than 18.5 kg/m²</td>
<td>underweight</td>
</tr>
<tr>
<td>18.5–25 kg/m²</td>
<td>18.5–23 kg/m²</td>
<td>increasing but acceptable risk</td>
</tr>
<tr>
<td>25–29.9 kg/m²</td>
<td>23–27.5 kg/m²</td>
<td>increased risk</td>
</tr>
<tr>
<td>30 kg/m² or higher</td>
<td>27.5 kg/m² or higher</td>
<td>high risk</td>
</tr>
</tbody>
</table>

**International Diabetes Federation guidance** on waist circumference thresholds as a measure of central obesity (Alberti et al. 2007)

<table>
<thead>
<tr>
<th>Ethnic group</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europids</td>
<td>≥ 94 cm</td>
<td>≥ 80 cm</td>
</tr>
<tr>
<td>South Asians</td>
<td>≥ 90 cm</td>
<td>≥ 80 cm</td>
</tr>
<tr>
<td>Chinese</td>
<td>≥ 90 cm</td>
<td>≥ 80 cm</td>
</tr>
<tr>
<td>Japanese</td>
<td>≥ 90 cm</td>
<td>≥ 80 cm</td>
</tr>
<tr>
<td>Ethnic south and central Americans</td>
<td>Use south Asian recommendations until more specific data are available</td>
<td></td>
</tr>
<tr>
<td>Sub-Saharan Africans</td>
<td>Use European data until more specific data are available</td>
<td></td>
</tr>
<tr>
<td>Eastern Mediterranean and middle east (Arab) populations</td>
<td>Use European data until more specific data are available</td>
<td></td>
</tr>
</tbody>
</table>

**South Asian Health Foundation position statement** on BMI and waist circumference (Kumar et al. 2010)

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Men and women</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>23 kg/m²</td>
<td></td>
</tr>
<tr>
<td>Waist circumference</td>
<td>Men</td>
<td>≥ 90 cm</td>
</tr>
<tr>
<td></td>
<td>women</td>
<td>≥ 80 cm</td>
</tr>
</tbody>
</table>

Other guidance is available from:
- Scottish Intercollegiate Guidelines Network (2010)
- Ministry of Health India (Misra et al. 2009)
- Ministry of Health Singapore (Health Promotion Board Singapore 2005)
- Obesity in Asia Collaboration (2007)
- Cooperative meta-analysis group of the working group on obesity in China (Zhou 2002)
5 Draft recommendations

Introduction

The Public Health Interventions Advisory Committee (PHIAC) considers that the recommended approaches are important for practice.

The evidence statements underpinning the recommendations are listed in appendix C.

For the gaps in research, see section 6.

There was insufficient evidence to make recommendations on specific body mass index (BMI) or waist circumference thresholds for assessing the risk of type 2 diabetes, cardiovascular disease or mortality among black, Asian and other minority ethnic groups. However, PHIAC has developed general recommendations on measuring BMI.

Whose health will benefit?

The recommendations aim to benefit adults from black, Asian and other minority ethnic groups living in England. These groups are defined as follows, unless explicitly stated otherwise:

- South Asian people are immigrants and descendants from Bangladesh, Bhutan, India, Indian-Caribbean (immigrants of South Asian family origin), Maldives, Nepal, Pakistan and Sri Lanka.¹
- African-Caribbean/black Caribbean people are immigrants and descendants from the Caribbean islands (people of black Caribbean family origin may also be described as African-American).
- Black African people are immigrants and descendants from African nations. In some cases they may also be described as sub-Saharan African or African-American.

¹ South Asian Public Health Association (2011) FAQ: Who is considered South Asian? [online]

Body mass index and waist circumference thresholds for intervening to prevent ill health among black, Asian and other minority ethnic groups consultation draft  Page 7 of 30
‘Other minority ethnic groups’ include people of Chinese, Middle-Eastern and mixed family origin as follows:

- Chinese people are immigrants and descendants from China, Taiwan and Hong Kong.
- Middle-Eastern people are immigrants and descendants from Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, the United Arab Emirates and Yemen.
- People of mixed family origin have parents of 2 or more different ethnic groups.

**Recommendation 1**

**Who should take action?**

- GPs, practice nurses and other health professionals in primary and secondary care and community venues. This includes those delivering the NHS Health Check programme.
- Health improvement practitioners, exercise referral practitioners and health trainers employed by local government and the voluntary sector.

**What action should they take?**

- Measure height and weight and then calculate and record BMI and ethnicity in the electronic patient record for people from black, Asian and other minority ethnic groups. Do not rely on self-reported height and weight measurements.
- Recognise that people from black, Asian and other minority ethnic groups are at equivalent risk for diabetes and mortality at a lower BMI than white people.

See also NICE guidance on preventing type 2 diabetes – risk identification and interventions for individuals at high risk in the Preventing type 2 diabetes pathway, specifically:

- **Service provision**.
- **Promoting risk assessment**.

Body mass index and waist circumference thresholds for intervening to prevent ill health among black, Asian and other minority ethnic groups consultation draft Page 8 of 30
• **Identifying those at risk.**

• **Offer a blood test.**

• **Provide group and individual-level interventions to people at high risk.**

**Recommendation 2**

**Who should take action?**

See above plus:

• Directors of public health.

• Managers of adult social, residential and community services and local authority leisure services.

• Managers of voluntary, not-for-profit and non-government organisations. (This includes faith and community groups, diabetes support groups and charities.)

**What action should they take?**

• Work in partnership with existing black, Asian and other minority ethnic community initiatives to raise awareness of the equivalent risk of diabetes and mortality at a lower BMI, compared with white populations. Ensure the material used to raise awareness:
  
  – describes how to measure BMI accurately
  
  – explains the health risks associated with obesity and how people can lose weight, sustain weight loss or prevent further weight gain
  
  – addresses the needs of people whose first language is not English (by providing translations)
  
  – addresses the needs of people who cannot read (by providing material in, for example, pictorial, audio or video format)
  
  – uses language that does not stigmatise people within their own or the general community.

• Use existing national and local black, Asian and other minority ethnic information networks (including culturally-specific TV and radio channels) to disseminate the Body mass index and waist circumference thresholds for intervening to prevent ill health among black, Asian and other minority ethnic groups consultation draft Page 9 of 30
information. Also use traditional sources of health advice within these communities for dissemination.

6 What further research needs to be done?

The Public Health Interventions Advisory Committee (PHIAC) recommends that the following research questions should be addressed.

6.1 What are the cut-off points for body mass index (BMI) among adults from black, Asian and other minority ethnic groups living in the UK that are ‘risk equivalent’ to the current thresholds for mortality, cancer, type 2 diabetes, stroke and myocardial infarction set for white European populations? Ideally, prospective cohort studies should be used. Studies should use objectively measured height and weight and consider incidence as well as prevalence. Estimates should be adjusted for potential confounders.

6.2 What are the cut-off points for waist circumference among adults from black, Asian and other minority ethnic groups living in the UK that are ‘risk equivalent’ to the current thresholds for mortality, cancer, type 2 diabetes, stroke and myocardial infarction set for white European populations? Ideally, prospective cohort studies should be used. Studies should use objectively measured height and weight and consider incidence as well as prevalence. Estimates should be adjusted for potential confounders.

6.3 Is the risk of ill health the same for first, second and third generation immigrants from black, Asian and other minority ethnic groups (or those of mixed ethnicity) at the same BMI and waist circumference thresholds?

6.4 What are the risks and benefits of developing single-figure cut-off points on BMI and waist circumference for black, Asian and other minority ethnic groups to help prevent diabetes and other conditions?

6.5 Do clinicians intervene at lower BMI and waist circumference thresholds to prevent diabetes and other conditions among people from black, Asian and other minority ethnic groups?
6.6 How effective and cost effective are lifestyle interventions for people from black, Asian and other minority ethnic groups at different BMI and waist circumference thresholds, compared to the general population? Ideally this evidence should come from randomised controlled trials.

6.7 Are black, Asian and other minority ethnic groups aware that they are at the same risk of type 2 diabetes and mortality at a lower BMI, compared to the white population?

6.8 Are clinicians and weight management service providers aware that black, Asian and other minority ethnic groups are at the same risk of type 2 diabetes and mortality at a lower BMI compared to the white population?
Appendix A Public health need and practice

Minority ethnic groups living in England and the UK

Between 2005 and 2008, 9.3% of all babies born in England were of South Asian origin (defined as ‘Bangladeshi, Indian, Pakistani and any other Asian background’ with the exception of Chinese people). A further 5.3% were of black family origin (defined as ‘African, Caribbean and any other black background’) (Office for National Statistics 2011a).

According to mid-2009 population estimates, 6.62 million people in the UK belonged to a black, Asian or other minority ethnic group, representing 12.1% of the total population. People of Indian family origin were the largest minority ethnic group, followed by people of Pakistani family origin, those of mixed ethnic family origin and people of black African, black Caribbean and Chinese family origin (Office for National Statistics 2011b). Nearly half (48%) of the total black and minority ethnic population live in the London region, where they comprise 29% of all residents (White 2002).

Measuring excess body fat

Body mass index (BMI) (defined as weight in kilograms divided by the square of height in metres) is a useful indicator for excess body fat. A ‘raised’ waist circumference is a useful indicator of excess abdominal adiposity.

According to the widely used criteria from the World Health Organization, adults of white European origin with a BMI of 30 kg/m² or more are described as obese and those with a BMI from 25–29.9 kg/m² are considered overweight.

A ‘raised’ waist circumference is defined as above 102 cm for men and above 88 cm for women. However, the International Diabetes Federation has suggested lower cut-off points (of 94 cm in men and 80 cm in women) for measuring ‘metabolic syndrome’ (Alberti et al. 2005).

The BMI cut-off points identified above correspond to the risk of a range of chronic diseases and mortality among Europeans (World Health Organization 1998).

Body mass index and waist circumference thresholds for intervening to prevent ill health among black, Asian and other minority ethnic groups consultation draft Page 12 of 30
However, these thresholds do not account for the wide variation in body fat distribution – and may not correspond to the same degree of associated health risk – for different ethnic groups (World Health Organization 2000).

A recent report stressed: ‘there is no straightforward relationship between obesity and ethnicity, with a complex interplay of factors affecting health in minority ethnic communities in the UK’. It added that the validity of using current definitions of obesity for non-white minority ethnic groups is debatable (National Obesity Observatory 2011).

In response to a World Health Organization report (2004), the NHS Health Checks programme uses a BMI of 27.5 kg/m² as the trigger for preventive action among people of South Asian origin. NICE clinical guidance 43 on obesity did not consider there to be sufficient evidence to set separate cut-off points for the BMI or waist circumference of this group. However, waist circumference cut-off points of ≥90cm for men and ≥80cm for women for South Asian and Chinese populations have subsequently been proposed in the International Diabetes Federation (IDF) statement on type 2 diabetes prevention (Alberti et al. 2005).

The IDF proposal is in line with general World Health Organization (2004) guidance, which recognises the increased risk of type 2 diabetes and cardiovascular disease at a lower BMI among people from Asian populations², in comparison to people from white populations.

It is worth noting that a single BMI and waist circumference cut-off point may not be appropriate for all black, Asian and other minority ethnic groups. However, the current evidence is not consistent or robust enough to delineate between these population groups.

**Obesity: links to chronic health conditions and ethnicity**

Excess body fat contributes to around 58% of cases of type 2 diabetes, 21% of heart disease and between 8% and 42% of certain cancers (breast, colon and

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² This relates to all South Asian and Chinese populations as described above plus other Asian populations for example Japanese, Korean, Indonesian, Filipino and Thai.

Body mass index and waist circumference thresholds for intervening to prevent ill health among black, Asian and other minority ethnic groups consultation draft Page 13 of 30
endometrial) (DH 2003). However, the point at which the level of body fat becomes risky to health varies between ethnic groups.

In addition, the prevalence of some of these health conditions is far greater among black, Asian and other minority ethnic groups – despite the fact that rates of obesity among these groups are similar to the white population (World Health Organization 2004).

In the UK, people of black African and African-Caribbean origin are 3 times more likely to have type 2 diabetes than the white population. Type 2 diabetes is also more common among Chinese people (DH 2001). In addition, people from all of these groups are more at risk of stroke (National Obesity Observatory 2011).

Type 2 diabetes is also more prevalent among black Caribbean, Indian, Pakistani and Bangladeshi men aged 35–54 than the general UK population. With the exception of black African men, it is also more prevalent among those aged 55 and over from these groups.

Among women, type 2 diabetes is more common among Indian, Pakistani and Bangladeshi groups (aged 35 and over) and black Caribbeans (aged 55 and over) in the UK (NHS Information Centre 2005).

People from black, Asian and other minority ethnic groups also tend to progress from impaired glucose tolerance (IGT) to diabetes much more quickly than average (more than twice the rate of white populations) (Ramachandran et al. 2006).

**Body fat variations among ethnic groups**

Compared to white Europeans, people of South Asian origin living in England tend to have a higher percentage of body fat at a given BMI. They also tend to have more features of the metabolic syndrome at a given waist circumference (for example, higher triglycerides and lower high-density lipoproteins in women and higher serum glucose in men). (For details see NICE guidance on obesity.)

The prevalence of obesity among South Asian groups is similar to or lower than that among the white population in the UK. However, rates of myocardial infarctions are
higher among South Asian groups at an earlier age – and death rates from cardiovascular disease are approximately 50% higher (Allender et al. 2007). In addition, the prevalence of diabetes is up to 6 times higher among South Asian groups, it tends to develop at a younger age and disease progression is faster (Khunti et al. 2009).

It has been suggested that this increased risk may be due to South Asian people accumulating more fat in the abdomen and around the waist, compared to white European populations. Fat distributed in this region of the body is considered to be more ‘metabolically active’. It is also closely associated with insulin resistance, pre-diabetes and type 2 diabetes (McKeigue et al. 1991; 1992; 1993; Banerji et al. 1999).
Appendix B Detailed description of the process

Introduction

The referral received from the Department of Health on 6 July 2011 stated the need for guidance on:

'Assessing BMI and waist circumference in adults in BME groups in the UK (in relation to the risk of health problems)'.

Usually the Public Health Interventions Advisory Committee (PHIAC) examines public health interventions to see which are effective and cost effective in terms of improving a particular health condition or outcome, such as obesity. This referral, however, is about determining whether there may be a need to intervene with some groups earlier than is usual practice for the general population. The aim is to ensure prevention advice and guidance is given to everyone at the point when they face the same level of risk.

An internal decision was taken by the Centre for Public Health Excellence (CPHE) to develop this referral using the NICE public health intervention process, because it was considered to be a clear and delineated question. It was also considered that PHIAC had the required epidemiological expertise to develop this type of guidance.

The stages involved in developing this guidance are outlined in the box below.

1. Draft scope released for consultation
2. Stakeholder comments used to revise the scope
3. Final scope and responses to comments published on website
4. Evidence review undertaken and submitted to PHIAC
5. PHIAC produces draft guidance
6. Draft guidance (and evidence) released for consultation
7. PHIAC amends guidance
Determining the scope and finding the evidence

This is not a typical referral, so the usual searches and appraisal of studies of effectiveness and cost effectiveness were not appropriate.

The referral itself was broad, in terms of aiming to address the 'risk of health problems' relating to key health conditions associated with BMI and waist circumference in the populations of interest.

Following consultation on the scope, the CPHE project team were able hone the research questions and develop criteria for sifting the literature in terms of:

- the black, Asian and other minority ethnic groups of interest in the UK
- key health outcomes of particular importance to these groups
- study, analysis type and key questions to answer the referral
- understanding the breadth and depth of evidence available
- summarising the search and obtaining confirmation of its completeness.

Diabetes, stroke and myocardial infarction were considered the most important conditions related to obesity and, where relevant, were most likely to have study data available. Other measures of adiposity (that is, waist to hip and waist to height ratio) were also suggested during public consultation on the scope. However, a decision was made to focus only on the 2 measures described in the DH referral.

It was decided that the focus should be on South Asian, Chinese, black, Middle Eastern and mixed-ethnicity populations worldwide, based on the prevalence of these groups within the UK. Studies of Japanese, Aboriginal and Hispanic populations were thus excluded.

Questions

Question 1: How accurate are body mass index (BMI) and waist circumference in predicting the future risk of type 2 diabetes, fatal/non-fatal myocardial infarction or stroke and overall mortality among adults from black, Asian and other minority ethnic groups living in the UK, compared to the white or general UK population?

Body mass index and waist circumference thresholds for intervening to prevent ill health among black, Asian and other minority ethnic groups consultation draft Page 17 of 30
**Question 2:** What are the BMI and waist circumference cut-off points indicating a healthy range for these measures among adults from different black, Asian and other minority ethnic groups living in the UK?

**Question 3:** What are the BMI and waist circumference cut-off points that indicate an increased risk of type 2 diabetes, fatal/non-fatal myocardial infarction and stroke and the need for preventive action among adults from different black, Asian and other minority ethnic groups living in the UK?

**Question 4:** What are the cut-off points for BMI and waist circumference among adults from black, Asian and other minority ethnic groups living in the UK that are ‘risk equivalent’ to the current thresholds set for white European populations?

**Developing the evidence base**

A trial search of standard literature databases conducted by the Centre for Public Health Excellence project team at NICE yielded a high volume of results (approximately 12,000), many of which were irrelevant.

A Google scholar ‘cited by’ search was then conducted using 46 key papers identified by a small number of topic experts and the project team. This produced approximately 4000 results. These were sifted by a CPHE analyst using selection criteria developed following the expert panel meeting.

An external contractor, Bazian, used the identified literature to answer the 4 key questions in the final scope.

Following this, PHIAC decided that only evidence relating to question 4 would be required to answer the DH referral. As a result, only evidence relating to question 4 has been considered during development of the draft recommendations.

**Quality appraisal**

Included papers were assessed for methodological rigour and quality using modified quality assessment checklists based on the tools from appendices G and J of the ‘Methods for the development of NICE public health guidance’, and appendices G
and J of ‘The guidelines manual 2009’ (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.

Given the nature of the review questions, and the various settings of the identified evidence, additional applicability summary score was given. This score rated the study’s generalisability to black, Asian and minority ethnic populations in the UK, and was reported using the same (++), (+) moderate and (-) weak scoring system as the quality summary score. Scores are presented as quality/applicability.

Overall, if a study was rated as having a moderate summary validity score and a weak summary applicability score the following would appear in parentheses (+/-).
Appendix C Evidence statements

This appendix lists the evidence statements from 1 review provided by external contractors: ‘Body mass index and waist circumference thresholds for intervening to prevent ill health among black, Asian and other minority ethnic groups in the UK’. The evidence statements are short summaries of the evidence in the review.

The numbers refer to the document number and the number of the evidence statement in the document.

Evidence statement number 4.1a indicates that the linked statement is numbered 4.1a in the review ‘Body mass index and waist circumference thresholds for intervening to prevent ill health among black, Asian and other minority ethnic groups in the UK’.

The review is available at the NICE website.

See appendix B for the meaning of the (++), (+) and (-) quality assessments referred to in the evidence statements.

Please note that the wording of some evidence statements has been altered slightly from those in the evidence review to make them more consistent with each other and NICE’s standard house style. The superscript numbers refer to the studies cited beneath each statement. The full references for those studies can be found in the reviews.

Evidence statement 4.1a BMI cut-off points indicating ‘risk equivalence’ for black populations (type 2 diabetes) from UK or western countries

Strong evidence was found from 3 cohort studies (2 [+] and 1 [++] in Canada and the US1-3 and 3 cross-sectional studies (2 [+] and 1 [++]) in the US4-6 that for a body mass index (BMI) of around 30 kg/m² in white populations, the equivalent diabetes risk in black populations is at BMI values 0.1–4 units lower (26–29.9 kg/m²). For a BMI of 25 kg/m² in white populations, the equivalent diabetes risk in black populations was found at BMI values 2–4 units lower (21–23 kg/m²).

These studies had moderate applicability to the UK.

Body mass index and waist circumference thresholds for intervening to prevent ill health among black, Asian and other minority ethnic groups consultation draft Page 20 of 30
Evidence statement 4.2 BMI cut-off points indicating ‘risk equivalence’ for black populations (myocardial infarction, stroke or mortality) from UK or western countries

Limited evidence was found from 1 (++) cohort study\(^1\) that, at a BMI of 20 kg/m\(^2\), black populations have an equivalent mortality risk to that seen in white populations at 30 kg/m\(^2\). This study has moderate applicability to the UK.

No evidence was found relevant to risk-equivalent BMI cut-points for myocardial infarction or stroke in black populations.

\(^1\) Stevens (2002)

Evidence statement 4.5a BMI cut-off points indicating ‘risk equivalence’ for South Asian populations (type 2 diabetes) from UK or western countries

Limited evidence was found from 1 (+) cohort study in Canada\(^1\) that, for a BMI of 30 kg/m\(^2\) in white populations, the equivalent incident diabetes risk in South Asian populations was found at BMI values 6 units lower (24 kg/m\(^2\)). No equivalent value to a BMI of 25 kg/m\(^2\) was reported.

This study had moderate applicability to the UK.

\(^1\) Chiu (2011)

Evidence statement 4.5b BMI cut-off points indicating ‘risk equivalence’ for South Asian populations (type 2 diabetes) from other countries

Limited graphical evidence was found from 1 (+) review\(^1\) related to diabetes risk across BMI values, indicating a risk equivalence at 19–20 kg/m\(^2\) among South Asian populations.

Body mass index and waist circumference thresholds for intervening to prevent ill health among black, Asian and other minority ethnic groups consultation draft Page 21 of 30
men and 30 kg/m$^2$ among European men. No risk equivalence points were identified for women at this BMI cut-off point, and no values were identified for either men or women equivalent to the risk seen among white Europeans at 25 kg/m$^2$.

This study had moderate applicability to the UK.

$^1$Nyamdorj (2010b)

**Evidence statement 4.13a BMI cut-off points indicating ‘risk equivalence’ for Chinese populations (type 2 diabetes) from UK or western countries**

Limited evidence was found from 2 (+) cohorts$^1,2$ that, for a BMI of around 30 kg/m$^2$ in white populations, the equivalent incident diabetes risk in Chinese populations was found at BMI values 2.5–5 units lower. In 1 (+) study$^2$, for a BMI of around 25 kg/m$^2$ in white populations, the equivalent incident diabetes risk in Chinese populations was found at BMI values 2 units lower.

These studies have moderate applicability to the UK.

$^1$Chiu (2011)

$^2$Stevens (2008)

**Evidence statement 4.13b BMI cut-off points indicating ‘risk equivalence’ for Chinese populations (type 2 diabetes) from other countries**

One (+) review of studies$^1$ provides limited evidence that, for a BMI of around 30 kg/m$^2$ in white populations, the equivalent incident diabetes risk in Chinese men occurs at BMI values 5 kg/m$^2$ lower for Chinese men and 8 kg/m$^2$ lower for Chinese women.

This review had moderate applicability to the UK.

$^1$Nyamdorj (2010b)
Appendix D Membership of the Public Health Interventions Advisory Committee (PHIAC), the NICE project team and external contractors

Public Health Interventions Advisory Committee

NICE has set up a standing committee, the Public Health Interventions Advisory Committee (PHIAC), which reviews the evidence and develops recommendations on public health interventions.

Membership of PHIAC is multidisciplinary, comprising public health practitioners, clinicians, local authority officers, teachers, social care professionals, representatives of the public, academics and technical experts as follows.

John F Barker Associate Foundation Stage Regional Adviser for the Parents as Partners in Early Learning Project, DfES National Strategies

Sarah Byford Professor of Health Economics, Centre for the Economics of Mental and Physical Health, Institute of Psychiatry, King’s College London

K K Cheng Professor of Public Health and Primary Care, University of Birmingham

Joanne Cooke Programme Manager, Collaboration and Leadership in Applied Health Research and Care for South Yorkshire

Philip Cutler Project Coordinator, Bradford Alliance on Community Care

Lesley Michele de Meza Personal, Social, Health and Economic (PSHE) Education Consultant, Trainer and Writer

Ruth Hall Public Health Consultant

Amanda Hoey Director, Consumer Health Consulting Limited

Ann Hoskins Director, Children, Young People and Maternity, NHS North West

Muriel James Chair, King Edward Road Surgery Patient Participation Group

Body mass index and waist circumference thresholds for intervening to prevent ill health among black, Asian and other minority ethnic groups consultation draft Page 23 of 30
Matt Kearney General Practitioner, Castlefields, Runcorn and Primary Care; Public Health Adviser, Department of Health

CHAIR Catherine Law Professor of Public Health and Epidemiology, University College London Institute of Child Health

David McDaid Research Fellow, Department of Health and Social Care, London School of Economics and Political Science

Bren McInerney Lay Member

John Macleod Chair in Clinical Epidemiology and Primary Care, School of Social and Community Medicine, University of Bristol; Honorary Clinical Consultant in Primary Care, NHS Bristol; GP, Hartcliffe Health Centre, Bristol

Susan Michie Professor of Health Psychology, British Psychological Society Centre for Outcomes Research and Effectiveness, University College London

Stephen Morris Professor of Health Economics, Department of Epidemiology and Public Health, University College London

Toby Prevost Professor of Medical Statistics, Department of Primary Care and Public Health Sciences, King's College London

Jane Putsey Lay Member. Registered with the Breastfeeding Network

Mike Rayner Director, British Heart Foundation Health Promotion Research Group, Department of Public Health, University of Oxford

Dale Robinson Chartered Environmental Health Practitioner; Director, Dr Resolutions Limited

Joyce Rothschild Education Consultant

Kamran Siddiqi Clinical Senior Lecturer in Epidemiology and Public Health, Department of Health Sciences/Hull York Medical School, University of York

David Sloan Retired Director of Public Health

Body mass index and waist circumference thresholds for intervening to prevent ill health among black, Asian and other minority ethnic groups consultation draft Page 24 of 30
Stephanie Taylor  Professor of Public Health and Primary Care, Centre for Health Sciences, Barts and The London School of Medicine and Dentistry

Stephen Walters  Professor in Medical Statistics and Clinical Trials, University of Sheffield

Expert co-optees to PHIAC:
Dr Nita Forouhi  Group Leader, Nutritional Epidemiology Programme, MRC Epidemiology Unit, Cambridge

Professor Naveed Sattar  Lead, Metabolic Medicine Group, BHF Glasgow Cardiovascular Centre, University of Glasgow

NICE project team
Mike Kelly  CPHE Director

Antony Morgan  Associate Director

Nicola Ainsworth  Lead Analyst

Rachel Kettle  Lead Analyst

Caroline Mulvihill  Analyst

Una Canning  Analyst

Patricia Mountain  Project Manager

Rukshana Begum  Coordinator

Sue Jelley  Senior Editor

Alison Lake  Editor
External contractors

Evidence review

The review was carried out by Bazian Ltd. The principal authors were: Sarah Caton, Rob Cook and Alicia White.
Appendix E Supporting information and documents

The review includes full details of the methods used to select the evidence (including search strategies), assess its quality and summarise it.

The minutes of the Public Health Interventions Advisory Committee (PHIAC) meetings provide further detail about the Committee’s interpretation of the evidence and development of recommendations.

All supporting documents listed below are available at the NICE website.

- Evidence review: ‘Body mass index and waist circumference thresholds for intervening to prevent ill health among black, Asian and other minority ethnic groups in the UK’.

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

- ‘Methods for development of NICE public health guidance (second edition, 2009)’
- ‘The NICE public health guidance development process: An overview for stakeholders including public health practitioners, policy makers and the public (second edition, 2009)’
Appendix F References


Kumar S, Khunti K, Hanif W et al. (2010) Position statement on diagnosis and treatment of obesity in British South Asians [online]


Body mass index and waist circumference thresholds for intervening to prevent ill health among black, Asian and other minority ethnic groups consultation draft Page 28 of 30


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Body mass index and waist circumference thresholds for intervening to prevent ill health among black, Asian and other minority ethnic groups consultation draft Page 29 of 30

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