NICE National Institute for Health and Care Excellence

Appendix A1: Summary of evidence from surveillance

2018 surveillance of BMI: preventing ill health and premature death in black, Asian and other minority ethnic groups (2013) NICE guideline PH46

Summary of evidence from surveillance

Studies identified in searches are summarised from the information presented in their abstracts.

Feedback from topic experts who advised us on the approach to this surveillance review, and from stakeholders following public consultation, was considered alongside the evidence to reach a final decision on the need to update each section of the guideline.

Summary of new evidence from 2018 year surveillance	Intelligence gathering	Impact
Recommendation 1 Preventing type 2 diabetes		
Body mass index (BMI) to detect diabetes risk **South Asian populations** Three observational studies reported the BMI cut-off points to detect diabetes risk in South Asian residents living in the UK. For the equivalent 30kg/m^2 BMI of a white population, 2 studies(1,2) reported the optimal cut-off at 25kg/m^2 whilst 1	Feedback from topic experts suggested that BMI cut-off points indicated in the recommendations may require updating to be in line with recent studies. It was suggested that the cut-off points should be lower for Asian populations. Feedback indicated that there appears to be very little research evidence in black African populations.	**BMI** The current guideline recommendations advise on the use of lower BMI thresholds for South Asian and Chinese populations compared to the equivalent diabetes risk thresholds in white populations. For Asians, a BMI of 23-27.5kg/m2 would indicate increased risk and a BMI higher than 27.5kg/m2 indicates high risk.

study(3) found a lower cut-off at 22kg/m^2 for South Asian populations.

The ADDITION-Leicester study(1) also reported the equivalent BMI cut-off for an indigenous population in India at 18kg/m^2.

A cross-sectional study(4) in an Indian population determined the optimal BMI cut-off points for overweight at 21.87kg/m^2 and obese at 24.33kg/m^2.

Three observational studies(5–7) reported the BMI cut-off points to detect diabetes risk in South Asian residents living in the United States. They concluded that a BMI in the range of 23kg/m^2 to 25kg/m^2 in this population indicates an increased risk of type 2 diabetes compared with the higher European cut-off equivalents. However, the Asian thresholds also reported a high rate of false positives. They also found that lowering the BMI cut-off to 23kg/m^2 increased the sensitivity, however, it also decreased the specificity.

An observational study(8) in a Bangladeshi population reported the optimal BMI cut-off points associated with increased risk of diabetes at 21.2kg/m^2 for men and 21.8kg/m^2 for women.

A cross-sectional study(9) was conducted to determine the optimal BMI cut-off points for overweight and obese categories in Creole and Indian populations living in Mauritius. The optimal BMI cut-off points for Creole men were 24kg/m^2 for overweight and 29.5kg/m^2 for obese, however, these were found to be 2-4 units lower for Creole

Topic experts commented that sub-group differences may exist within the Asian category and that these sub-groups should be considered individually. This would support interventions being targeted appropriately and effectively.

During consultation, several comments suggested that the proposal to merge the guidelines would be pragmatic, practical and would save practitioner time. Comments suggested that the proposed merge into a main obesity guideline would give more impact and create widespread awareness of the recommendations for black, Asian and other minority ethnic groups.

Stakeholders also commented that the proposed merge of guidelines should ensure that all the information from NICE guideline PH46 continues to be included. Comments suggested that consideration should be given to highlight the tailored assessment and interventions specific for this population when recommendations are incorporated into NICE guideline CG189.

Several stakeholders commented that men, children and young people, and subgroups within black, Asian and other minority ethnic populations should not be generalised when using thresholds.

The new evidence supports the recommendations on BMI cut-off points for South Asian and Chinese populations to be lower than the equivalent for a white population. There is some evidence and topic expert feedback to indicate that the Asian BMI thresholds could be further lowered to detect diabetes risk. However, the statistical accuracy of the lower thresholds was not always reported in the study abstracts. There are also reports of high rates of false positives and decreased specificity for the lower thresholds.

Most of the studies do not appear to show a discernible difference in BMI thresholds between men and women or between individual countries from these regions.

For a black population in the UK, the BMI cut-off points were found to be closer to the white European thresholds. However, these were also found to be 1-2 units lower. This new evidence supports the guideline recommendations which advise on the use of the lower Asian thresholds for a black population. Although, only 2 studies provided data for this population which supports the topic expert's view that there is very little evidence for a black population.

There is also insufficient evidence to detect any generational differences in BMI thresholds for minority ethnic groups.

The new evidence on BMI thresholds to detect diabetes risk seems generally in line with current

women. It was found that the cut-off points were lower for Indian men at 21kg/m^2 (overweight) and 26kg/m^2 (obese) and also for Indian women at 22kg/m^2 (overweight) and 27kg/m^2 (obese).

The American Diabetes Association report(10) contains references to a lower BMI cut-off for Asian populations and is consistent with the 23kg/m^2 as advised in the current recommendations.

Chinese populations

A cohort study(3) was conducted to detect diabetes risk in Chinese residents living in the UK. For the equivalent 30kg/m^2 BMI of a white population, optimal cut-offs were found at 24kg/m^2 for Chinese women and 26kg/m^2 for Chinese male populations.

A cross-sectional study(11) in Chinese pulmonary tuberculosis patients found BMI cut-off points at 22.22kg/m^2 to screen for impaired fasting glucose and 22.34kg/m^2 to screen for diabetes. However, the study concluded that the accuracy of BMI to predict either condition was not sufficient.

A cross-sectional study(12) was conducted to determine the optimal BMI cut-off points for a Chinese population equivalent to the overweight (25kg/m^2) and obese (30kg/m^2) thresholds of white Americans. The overweight cut-off was found at 22.5kg/m^2 in men and 22.8kg/m^2 in women. The obese cut-off was found at 25.9kg/m^2 in men and 26.6kg/m^2 in women.

recommendations to use lower thresholds. Although there is some variation in the reported optimal cut-off points, the evidence is insufficient in volume and accuracy to warrant a change to current recommendations.

Waist circumference

The current guideline recommendations advise on the use of lower WC thresholds (90cm for men) for South Asian and Chinese male populations compared to the equivalent diabetes risk thresholds in white populations (94cm for men). The thresholds (80cm) for females from South Asian and Chinese populations is recommended in the guideline to remain the same as that for white Europeans (also 80cm). The recommendations also advise to use European thresholds for black populations.

The new evidence provides a varied range of WC thresholds for both men and women from black and Asian backgrounds. The general trend seems to indicate optimal WC cut-offs for these populations to be below those recommended in the guideline for white Europeans.

This evidence is generally consistent with the current guideline recommendations for an Asian population. However, this evidence is inconsistent with guideline recommendations for a black population. The evidence indicates that a black population has an optimal WC threshold lower than

Black African and Caribbean populations

Two cohort studies reported the BMI cut-off points to detect diabetes risk in African and Caribbean populations living in the UK. For the equivalent 30kg/m^2 BMI of a white population, optimal cut-offs were found at 26kg/m^2 in 1 study(3) and 27.2kg/m^2 in the other study(2) for a black population.

Waist circumference (WC) to detect diabetes risk

South Asian populations

Three observational studies reported the WC cut-off points to detect diabetes risk in South Asian residents living in the UK. For the equivalent 102cm WC of a white male population, 2 studies(1,2) reported the optimal cut-off at 90cm whilst 1 study(3) found a lower cut-off at 79cm for South Asian populations. For the equivalent 88cm WC of a white female population, the studies reported optimal cut-offs at 77cm(1), 84cm(2) and 70cm(3).

The ADDITION-Leicester study(1) also reported the equivalent WC cut-off for an indigenous population in India at 87cm for men and 54cm for women.

A cross-sectional study(6) in Filipino-American women found that the use of the Asian WC (80cm) cut-off detected an increased number of hypertension and diabetes cases compared with the European cut-off equivalent. However, the

those of Europeans. Although, with only 2 studies reporting data for a black population further evidence would be required to verify the accuracy of the results.

Using BMI and/or waist circumference as a measure to detect the risk of long-term health problems is currently covered in NICE guideline CG189. There is an overlap in recommendations across NICE guidelines CG189 and PH46. It is proposed that NICE guideline PH46 is withdrawn and the recommendations are incorporated into NICE guideline CG189. The surveillance review proposal includes a decision to ensure that no information is lost from NICE guideline PH46 when the guideline is withdrawn.

Stakeholders commented that thresholds for adiposity measures should not be generalised across population demographics. The current recommendations already contain separate thresholds for these demographic categories and the proposed merge of guidelines includes the decision to maintain these. Also, during the update of NICE guideline CG189, evidence for separate thresholds for children and young people from black, Asian and other minority ethnic populations to have specific recommendations will be considered.

Asian threshold also reported a high rate of false positives.

An observational study(8) reported the optimal WC cut-off point associated with increased risk of diabetes in Bangladeshi men and women at 82cm.

Chinese populations

A cohort study(3) was conducted to detect diabetes risk in Chinese residents living in the UK. For the equivalent 88cm WC of a white female population, optimal cut-offs were found at 74cm for a Chinese population. For the equivalent 102cm WC of a white male population, optimal cut-offs were found at 88cm for a Chinese population.

A cohort study(13) to detect diabetes risk in a Chinese population found optimal WC cut-off points at 90cm for men and 86cm for women.

Black African and Caribbean populations

Two cohort studies reported the optimal WC cut-off points to detect diabetes risk in black residents living in the UK. For the equivalent 88cm WC of a white female population, optimal cut-offs were found at 79cm in one study(3) and 81.2cm in the other study(2) for a black population. For the equivalent 102cm WC of a white male population, optimal cut-offs were found at 88cm in one study(3) and 90.6 in the other study(2) for a black population.

Recommendation 2 BMI assessment, multi-component interventions and best practice standards

None.	Topic experts questioned the implementation of the recommendations in clinical practice and whether services were set up to follow through on cases where increased risk had been identified.	Topic experts questioned the implementation of the recommendations, however, data is not available to determine the level of uptake of this guideline.
	Feedback indicated that there appears to be very little data collected on some of the other protected characteristics such as age and socioeconomic factors.	Topic experts also highlighted the lack of evidence relating to other characteristics. The new evidence found during surveillance of NICE guideline PH46 supports the view that studies have not addressed the potential associations between risk factors beyond ethnicity.
	Topic experts suggested that active case finding should be recommended to detect obesity in black, Asian and other minority ethnic populations.	There are also ongoing studies, the results of which will be considered when results publish as they relate to recommendation 2 and research recommendation 8. There is an ongoing study investigating the effectiveness of a diabetes prevention intervention and a study investigating lifestyle interventions for diabetes. Both are in a UK population which will include analysis of sub-groups.
	During consultation, stakeholders commented that there is currently inequality in access to weight management services for people with learning disabilities and/or mental health problems. Comments also suggested that the referral and uptake of lifestyle interventions in black, Asian and other minority ethnic groups should be identified.	BMI assessment and multi-component interventions are currently covered in NICE guideline CG189. There is an overlap in recommendations across NICE guidelines CG189 and PH46. It is proposed that NICE guideline PH46 is withdrawn and the recommendations are incorporated into NICE guideline CG189.
		Active case finding has been proposed to be included in the update of NICE guideline CG189.

| | | The rationale is that there is an increased risk of adverse health conditions in this population at different thresholds compared to other populations. There is a risk that adverse health conditions in black, Asian and other minority ethnic groups may not be identified using opportunistic identification as currently recommended in NICE guideline CG189.

Stakeholders commented that there is inequality in access to services for black, Asian and other minority ethnic populations. However, the surveillance review did not find any evidence relevant to the identification of access to services or interventions for people with learning disabilities, mental health problems or people from black, Asian and other minority ethnic groups. These points on inequalities will be passed to the guideline developers for consideration during the update of NICE guideline CG189. |
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| **Recommendation 3 General awareness raising** | | |
| None. | None. | It is proposed that NICE guideline PH46 is withdrawn and the recommendations are incorporated into NICE guideline CG189.

Although NICE guideline CG189 does not specifically include recommendations on general awareness raising, the recommendations from NICE guideline PH46 can be incorporated and |

		cross-references to other NICE guidelines maintained.
New area 1 BMI and WC for preventing type 2 diabetes in populations other than black, South Asian and Chinese		
Six observational studies(14–19) to detect diabetes risk in a Middle Eastern population found optimal BMI cut-off points for men ranging between 25kg/m2 and 28.5kg/m2. For women, this range was found at 25kg/m2 to 30kg/m2. These 6 studies also reported the optimal WC cut-off points for men ranging between 84cm and 98.5cm and for women this range was 71cm to 95cm. A cohort study(20) to detect diabetes risk in a Thai population found the optimal BMI cut-off point at 22kg/m2 for both men and women.	Feedback suggested that there is now evidence available to determine BMI cut-off points for other minority ethnic groups beyond Asian, black and Chinese. However, there remain some gaps in the evidence base especially for mixed race populations.	The current guideline recommendations do not specify BMI or WC thresholds for Middle Eastern or Thai populations. The new evidence for these populations is limited in number of studies and the results are inconclusive. The wide range of thresholds reported for a Middle Eastern population is unlikely to warrant inclusion in the guideline due to their variability. The 1 study reporting BMI cut-off points for a Thai population supports a lower threshold. This study alone is unlikely to change recommendations as further evidence in this population would be required to verify the accuracy of the cut-off points. Topic expert feedback suggests that evidence is now available for other minority ethnic groups. However, this does not appear to be the case for BMI and WC to detect diabetes risk.
New area 2 Waist to height ratio and waist to hip ratio for preventing type 2 diabetes		
A case-control study(21) in Ghana to detect diabetes risk found the optimal WHpR cut-off points at 0.90 in men and 0.88 in women.	None.	The current guideline recommendations do not provide any advice on WHtR or WHpR measurements or their equivalent cut-offs for any population.

A cross-sectional study(16) to detect diabetes risk in an Iranian population found optimal cut-off points at WHtR 0.51 in men and women. A cross-sectional study(6) in Filipino-American women to detect increased risk of hypertension and diabetes cases compared with the European cut-off equivalents found the use of the standard WHtR cut-off (>=0.50) was highly accurate in this population. An observational study(8) reported the optimal cut-off points associated with increased risk of diabetes in a Bangladeshi population. The following were found for men; WHpR 0.93, WHtR 0.53. For women, the following were found; WHpR 0.87, WHtR 0.54.		The new evidence on these measures to detect diabetes risk is inconclusive due to a limited number of studies for different populations. Further evidence would be required to validate the accuracy of WHpR and WHtR in specific populations. As such, the evidence is unlikely to warrant inclusion of these measures in the recommendations at this time.

New area 3 BMI and WC for conditions other than diabetes

Three observational studies(22–24) reported optimal BMI cut-off points to detect metabolic syndrome risk in Middle Eastern populations. For men, the cut-offs ranged between 25kg/m2 to 28.4kg/m2 and for women the range was 26kg/m2 to 30.3kg/m2. Waist circumference cut-off points to detect metabolic syndrome risk in a Middle Eastern population were reported in 4 studies(22,23,25,26). For men, the cut-offs ranged between 90cm and	Feedback indicated that there appears to be very little research evidence in South American populations.	The current guideline recommendations do not specify BMI or WC thresholds for conditions other than diabetes. During development, the guideline considered there to be insufficient evidence to make recommendations on the full range of health conditions. The new evidence indicates wide ranges in the thresholds for both BMI and WC across all populations. There is also insufficient data in the

97.8cm. For women, the cut-offs ranged between 87cm and 97cm.

Three observational studies(27–29) reported optimal BMI cut-off points to detect metabolic syndrome risk in a black population from sub-Saharan Africa. For men, the cut-offs ranged between 22kg/m2 to 24kg/m2 and for women the range was 22kg/m2 to 32kg/m2.

Waist circumference cut-off points to detect metabolic syndrome in a black population from sub-Saharan Africa were reported in 11 studies(29–39). For men, the cut-offs ranged between 80cm and 98cm. For women, the cut-offs ranged between 80cm and 99cm.

Five observational studies(27,40–43) and 1 systematic review(44) reported optimal BMI cut-off points to detect metabolic syndrome risk in Chinese populations. For men and women, the cut-offs ranged between 20.9kg/m2 to 26kg/m2.

However, a cross-sectional study(45) (n=15,478) to detect the association between BMI and all-cause mortality found no significant differences in risk across BMI categories in Chinese and white populations. The study concluded that there were no differences in BMI cut-off points between populations in relation to mortality.

Waist circumference cut-off points to detect metabolic syndrome risk in a Chinese population were reported in 8 studies(40–43,46–49). For men, the cut-offs ranged between 83.7cm and 94cm. For

abstracts of most included studies to determine which equivalent cut-off values were compared to.

The general trend in the new evidence indicates that black, Asian and other minority ethnic groups have BMI and WC cut-off points lower than those for white populations. However, the variability in the results and lack of a consistent comparator threshold suggest that recommendations are unlikely to change at this time.

women, the cut-offs ranged between 78cm and 88cm.

Three observational studies(27,50,51) reported optimal BMI cut-off points to detect metabolic syndrome risk in South Asian populations. For men, the cut-offs ranged between 19.6kg/m2 to 22kg/m2. For women, the cut-offs ranged between 19.6kg/m2 to 28.8kg/m2.

Waist circumference cut-off points to detect metabolic syndrome risk in a South Asian population were reported in 3 studies(50–52). For men, the cut-offs ranged between 90cm and 91cm. For women, the cut-offs ranged between 80cm and 91cm.

A cross-sectional study(53) to detect metabolic syndrome risk in a Japanese population found optimal WC cut-off points at 86cm for men and 80.9cm for women.

A cross-sectional study(54) in Taiwanese women was conducted to detect metabolic syndrome. For non-menopausal women the following optimal cut-off points were found; BMI 24kg/m2, WC 78cm. For menopausal women, the following were found; BMI 24.4kg/m2, WC 83cm.

A cross-sectional study(55) was conducted to detect the risk of all-cause mortality associated with BMI in a South Korean population. The study concluded that, in this population, a BMI range of 21-27.4kg/m2 is equivalent to the normal range

(18.5-23kg/m2) as proposed by the World Health Organisation for Asians.

A cross-sectional study(56) to detect metabolic syndrome risk in Korean women found optimal cut-off points for WC at 81.9cm.

A cross-sectional study(57) to detect cardiovascular risk found optimal BMI cut-off points at 23kg/m2 for men and 24kg/m2 for women.

Further analysis(58) of the same sample to detect cardiovascular risk found optimal WC cut-off points at 81cm for men and 80cm for women.

A cross-sectional study(59) to detect metabolic syndrome risk in a Thai population found optimal BMI cut-off points at 24.5kg/m2 for both men and women.

A cross-sectional study(60) was conducted to detect cardiometabolic disease risk in a rural Filipino population. Optimal cut-off points for men were found as follows; BMI 24kg/m2, WC 84cm. For women, the following were found; BMI 23kg/m2, WC 77cm.

A cross-sectional study(27) to detect cardiometabolic abnormalities of populations living in the United States reported a BMI cut-off point at 21.5kg/m2 for Hispanics as equivalent to a BMI of 25kg/m2 in white Americans.

New area 4 Waist to height ratio and waist to hip ratio for detecting conditions other than diabetes

Three studies(15,16,22) in a Middle Eastern population suggest that WHtR could be used as a predictor of risk and that the values should be higher than the standard 0.50 in a white population.

There are 2 studies(29,33) which indicate the use of WHtR as a predictor of risk in a sub-Saharan African population. The data would suggest that the standard 0.50 is accurate for men, however, this should be increased for women.

There is some data available on the accuracy of WHtR for a South Asian population. The few studies(6,8,50,51) which report this data suggest that these cut-off points should be increased for a South Asian population compared to the standard 0.50 ratio.

There are a number of studies(42,43,47,54,61–65) reporting the predictive value of WHtR for an East Asian population. Most studies indicate that the cut-off points for both men and women should be higher than the standard 0.50 in a white population.

A cross-sectional study(66) in Brazilian women found WHtR 0.54 to be the optimal cut-off to screen for hypertension.

Three studies(15,22,23) reported optimal WHpR cut-off points to detect metabolic syndrome in a Middle Eastern population. For men, the cut-off was found at 0.89 and for women this ranged from 0.81 to 0.90.

Topic experts highlighted that anthropometric measures other than BMI have now been studied and evidence is available on their accuracy which may provide indications of risk in black, Asian and minority ethnic groups. Other measures include waist to height ratio (WHtR) and waist to hip ratio (WHpR). However, one topic expert states that BMI is the most frequently used measure in practice.

There are currently no recommendations on the use of WHtR or WHpR in any population within NICE guideline PH46.

An accumulation of new evidence across populations has now been found to consider the inclusion of WHtR as an anthropometric measure to predict increased risk.

Most of the studies suggest that the WHtR cut-off in minority ethnic populations should be higher than the standard 0.50 as used in a white population.

However, there is considerable variation in the cut-off values and the predictive accuracy of WHtR as compared with other measures is yet to be determined.

The new evidence also found optimal cut-off values for WHpR. However, these studies are limited in number and again there is no equivalent threshold reported to measure against.

Although some evidence is emerging for both WHtR and WHpR to detect health conditions in black, Asian and minority ethnic groups, currently this evidence is inconclusive. Also, there is a limited number of studies for each population to accurately determine cut-off points for these measures.

This new evidence is unlikely to warrant a change to recommendations at this time.

One study(29) reported optimal WHpR cut-off points to detect metabolic syndrome in an African population. For men, the cut-off was found at 0.89 and for women it was 0.85.

Two studies(50,51) reported optimal WHpR cut-off points to detect metabolic syndrome in a South Asian population. For men, the cut-off ranged from 0.90 to 0.93 and for women this ranged from 0.78 to 0.87.

Five studies(43,54,56,60,63) reported optimal WHpR cut-off points to detect metabolic syndrome in an East Asian population. For men, the cut-off ranged from 0.89 to 0.91 and for women this ranged from 0.79 to 0.87.

Research recommendation 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 can be used to classify overweight and obesity or are 'risk equivalent' to the current thresholds in relation to 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.

The new evidence from recommendation 1 shows that BMI cut-off points vary across different population sub-groups, however, most studies support the recommendations for lower thresholds.	None.	As the included studies do not always report the equivalent cut-off values, it is not always clear which weight classification the minority ethnic BMIs relate to. As such, further evidence is required to answer this research recommendation. This research recommendation will be considered again at the next surveillance point.

Research recommendation 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 in relation to 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 waist circumference and consider incidence as well as prevalence. Estimates should be adjusted for potential confounders.

The new evidence from recommendation 1 shows that WC cut-off points vary across different population sub-groups, however, most studies support the recommendations for lower thresholds.	None.	The new evidence from recommendation 1 shows that WC cut-off points vary across different population sub-groups, however, most studies support the recommendations for lower thresholds. Although some studies indicate that the WC cut-off could be lower than recommended for an Asian population, the evidence is not conclusive enough to warrant a change to recommendations. This research recommendation will be considered again at the next surveillance point.

Research recommendation 3

What are the corresponding cut-off points for waist circumference among adult males and females from black, Asian and other minority ethnic groups living in the UK, based on overweight and obesity BMI classifications?

The new evidence from recommendation 1 shows that WC cut-off points vary across different population sub-groups, however, most studies support the recommendations for lower thresholds.	None.	Although some studies indicate that the WC cut-off could be lower than recommended for an Asian population, the evidence is not conclusive enough to warrant a change to recommendations. This research recommendation will be considered again at the next surveillance point.

Research recommendation 4

Is the risk of ill health the same for first, second and third generation immigrants from black, Asian and other minority ethnic groups at the same BMI and waist circumference thresholds?		
None.	None.	This research recommendation will be considered again at the next surveillance point.
Research recommendation 5 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?		
None.	None.	This research recommendation will be considered again at the next surveillance point.
Research recommendation 6 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?		
None.	None.	This research recommendation will be considered again at the next surveillance point.
Research recommendation 7 Are clinicians, practitioners 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? If so do they intervene at lower BMI and waist circumference thresholds?		
None.	Topic experts questioned the implementation of the recommendations in clinical practice and whether services were set up to follow through on cases where increased risk had been identified.	This research recommendation will be considered again at the next surveillance point.

Research recommendation 8

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.

Ongoing research relevant to the research recommendation was found in recommendation 2. The studies are investigating the effectiveness of lifestyle interventions for diabetes and cardiovascular risk in UK populations.	None.	This research recommendation will be considered again at the next surveillance point.

Editorial and factual corrections

During surveillance, we identified the following issues with the NICE version of the guideline that should be corrected:

Recommendation 2 in NICE guideline PH46 currently states:

Follow NICE recommendations on BMI assessment, and how to intervene, as set out in Obesity: the prevention, identification, assessment and management of overweight and obesity in adults and children (NICE clinical guideline 43). Specifically:

- Clinicians should assess comorbidities, diet, physical activity and motivation along with referral to specialist care if required. See Recommendation 1.2.3 Assessment

- Weight management programmes should include behaviour-change strategies to increase people's physical activity levels or decrease inactivity, improve eating behaviour and the quality of the person's diet and reduce energy intake. See Recommendation 1.2.4 Lifestyle interventions

- Primary care organisations and local authorities should recommend to patients, or consider endorsing, self-help, commercial and community weight management programmes only if they follow best practice. See Recommendation 1.1.7 Self-help, commercial and community programmes

The cross-referral and hyperlinks in the incorporated recommendations are out of date and require amending. Recommendation 2 should change to the following:

Follow NICE recommendations on BMI assessment, and how to intervene, as set out in Obesity: identification, assessment and management (NICE guideline CG189). Specifically sections 1.3 Assessment and 1.4 Lifestyle interventions.

Follow NICE recommendations on best practice standards and commissioning lifestyle weight management programmes as set out in Weight management: lifestyle services for overweight or obese adults (NICE guideline PH53). Specifically recommendation 13 Ensure contracts for lifestyle weight management programmes include specific outcomes and address local needs.

References

1. Bodicoat DH, Gray LJ, Henson J, Webb D, Guru A, Misra A, et al. (2014) Body mass index and waist circumference cut-points in multi-ethnic populations from the UK and India: the ADDITION-Leicester, Jaipur heart watch and New Delhi cross-sectional studies. PLoS ONE [Electronic Resource] 9(3):e90813

2. Tillin T, Sattar N, Godsland IF, Hughes AD, Chaturvedi N, Forouhi NG (2015) Ethnicity-specific obesity cut-points in the development of Type 2 diabetes - a prospective study including three ethnic groups in the United Kingdom. Diabetic Medicine 32(2):226–34

3. Ntuk UE, Gill JM, Mackay DF, Sattar N, Pell JP (2014) Ethnic-specific obesity cutoffs for diabetes risk: cross-sectional study of 490,288 UK biobank participants. Diabetes Care 37(9):2500–7

4. Pal A, De S, Sengupta P, Maity P, Goswami S, Dhara PC (2013) Re-evaluation of WHO-defined BMI cutoff value for defining overweight and obesity in the Bengalee (Indian) population. Mediterranean Journal of Nutrition and Metabolism 6(1):31–7

5. Araneta MR, Kanaya AM, Hsu WC, Chang HK, Grandinetti A, Boyko EJ, et al. (2015) Optimum BMI cut points to screen asian americans for type 2 diabetes. Diabetes Care 38(5):814–20

6. Battie CA, Borja-Hart N, Ancheta IB, Flores R, Rao G, Palaniappan L (2016) Comparison of body mass index, waist circumference, and waist to height ratio in the prediction of hypertension and diabetes mellitus: Filipino-American women cardiovascular study. Preventive Medicine Reports 4:608–13

7. Hsia DS, Larrivee S, Cefalu WT, Johnson WD (2015) Impact of Lowering BMI Cut Points as Recommended in the Revised American Diabetes Association's Standards of Medical Care in Diabetes-2015 on Diabetes Screening in Asian Americans. Diabetes Care 38(11):2166–8

8. Bhowmik B, Munir SB, Ahmed KR, Siddiquee T, Diep LM, Wright E, et al. (2014) Anthropometric indices of obesity and type 2 diabetes in Bangladeshi population: Chandra Rural Diabetes Study (CRDS). Obesity Research and Clinical Practice 8(3):e220–9

9. Hunma S, Ramuth H, Miles-Chan JL, Schutz Y, Montani JP, Joonas N, et al. (2016) Body composition-derived BMI cut-offs for overweight and obesity in Indians and Creoles of Mauritius: comparison with Caucasians. International Journal of Obesity 40(12):1906–14

10. American Diabetes Association (2015) Standards of Medical Care in Diabetes—2015. Diabetes Care 38(January):S1–2

11. Cai J, Ma A, Wang Q, Han X, Zhao S, Wang Y, et al. (2017) Association between body mass index and diabetes mellitus in tuberculosis patients in China: a community based cross-sectional study. BMC Public Health 17(1):228

12. He W, Li Q, Yang M, Jiao J, Ma X, Zhou Y, et al. (2015) Lower BMI cutoffs to define overweight and obesity in China. Obesity 23(3):684–91

13. Xin Z, Liu C, Niu WY, Feng JP, Zhao L, Ma YH, et al. (2012) Identifying obesity indicators which best correlate with type 2 diabetes in a Chinese population. BMC Public Health 12:732

14.   Habib SS (2013) Body mass index and body fat percentage in assessment of obesity prevalence in saudi adults. Biomedical & Environmental Sciences 26(2):94–9

15.   Motlagh E, M, Shirvani N, D S, Ghadimi R, Taheri M, et al. (2017) Optimal anthropometric cutoff points to predict overweight and obesity: A cross-sectional survey in Iranian females. Iranian Red Crescent Medical Journal 19 (5) (no(e41497)

16.   Hajian-Tilaki K, Heidari B (2015) Is waist circumference a better predictor of diabetes than body mass index or waist-to-height ratio in Iranian adults? International Journal of Preventive Medicine 2015–Janua(6:5)

17.   Mirarefin M, Sharifi F, Fakhrzadeh H, Amini MR, Ghaderpanahi M, Shoa NZ, et al. (2014) Waist circumference and insulin resistance in elderly men: An analysis of Kahrizak elderly study. Journal of Diabetes and Metabolic Disorders 13 (1) (no(28)

18.   Talaei M, Sadeghi M, Marshall T, Thomas GN, Iranipour R, Nazarat N, et al. (2013) Anthropometric indices predicting incident type 2 diabetes in an Iranian population: the Isfahan Cohort Study. Diabetes & Metabolism 39(5):424–31

19.   Bennet L, Stenkula K, Cushman SW, Brismar K (2016) BMI and waist circumference cut-offs for corresponding levels of insulin sensitivity in a Middle Eastern immigrant versus a native Swedish population - the MEDIM population based study. BMC Public Health 16(1):1242

20.   Papier K, D'Este C, Bain C, Banwell C, Seubsman SA, Sleigh A, et al. (2017) Body mass index and type 2 diabetes in Thai adults: defining risk thresholds and population impacts. BMC Public Health 17(1):707

21.   Frank LK, Heraclides A, Danquah I, Bedu-Addo G, Mockenhaupt FP, Schulze MB (2013) Measures of general and central obesity and risk of type 2 diabetes in a Ghanaian population. Tropical Medicine & International Health 18(2):141–51

22.   Al-Odat AZ, Ahmad MN, Haddad FH (2012) References of anthropometric indices of central obesity and metabolic syndrome in Jordanian men and women. Diabetes & Metabolic Syndrome 6(1):15–21

23.   Al-Rubean K, Youssef AM, AlFarsi Y, Al-Sharqawi AH, Bawazeer N, AlOtaibi MT, et al. (2017) Anthropometric cutoff values for predicting metabolic syndrome in a Saudi community: from the SAUDI-DM study. Annals of Saudi Medicine 37(1):471–80

24.   Babai MA, Arasteh P, Hadibarhaghtalab M, Naghizadeh MM, Salehi A, Askari A, et al. (2016) Defining a BMI cut-off point for the iranian population: The shiraz heart study. PLoS ONE 11 (8) (no(e0160639)

25.   Gozashti MH, Najmeasadat F, Mohadeseh S, Najafipour H (2014) Determination of most suitable cut off point of waist circumference for diagnosis of metabolic syndrome in Kerman. Diabetes & Metabolic Syndrome 8(1):8–12

26.   Talaei M, Thomas GN, Marshall T, Sadeghi M, Iranipour R, Oveisgharan S, et al. (2012) Appropriate cut-off values of waist circumference to predict cardiovascular outcomes: 7-year follow-up in an Iranian population. Internal Medicine 51(2):139–46

27.   Gujral UP, Vittinghoff E, Mongraw-Chaffin M, Vaidya D, Kandula NR, Allison M, et al. (2017) Cardiometabolic Abnormalities Among Normal-Weight

Persons From Five Racial/Ethnic Groups in the United States: A Cross-sectional Analysis of Two Cohort Studies. Annals of Internal Medicine 166(9):628–36

28.   Kruger HS, Schutte AE, Walsh CM, Kruger A, Rennie KL (2017) Body mass index cut-points to identify cardiometabolic risk in black South Africans. European Journal of Nutrition 56(1):193–202

29.   Peer N, Steyn K, Levitt N (2016) Differential obesity indices identify the metabolic syndrome in Black men and women in Cape Town: the CRIBSA study. Journal of Public Health 38(1):175–82

30.   Staiano AE, Bouchard C, Katzmarzyk PT (2013) BMI-specific waist circumference thresholds to discriminate elevated cardiometabolic risk in White and African American adults. Obesity Facts 6(4):317–24

31.   Botha J, Ridder de, H J, Potgieter JC, Steyn HS, Malan L (2013) Structural vascular disease in Africans: Performance of ethnic-specific waist circumference cut points using logistic regression and neural network analyses: The SABPA study. Experimental & Clinical Endocrinology & Diabetes 121(9):515–20

32.   Ekoru K, V MGA, Young EH, Delisle H, Jerome CS, Assah F, et al. (2017) Deriving an optimal threshold of waist circumference for detecting cardiometabolic risk in sub-Saharan Africa. International Journal of Obesity 3:3

33.   L MAE, Delisle H, Vilgrain C, Larco P, Sodjinou R, Batal M (2015) Specific cut-off points for waist circumference and waist-to-height ratio as predictors of cardiometabolic risk in Black subjects: A cross-sectional study in Benin and Haiti. Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy 8:513–23

34.   Crowther NJ, Norris SA (2012) The current waist circumference cut point used for the diagnosis of metabolic syndrome in sub-Saharan African women is not appropriate. PLoS ONE [Electronic Resource] 7(11):e48883

35.   Hoebel S, Malan L, Ridder D, H J (2013) Determining ethnic-, gender-, and age-specific waist circumference cut-off points to predict metabolic syndrome: The Sympathetic Activity and Ambulatory Blood Pressure in Africans (SABPA) study. Journal of Endocrinology, Metabolism and Diabetes of South Africa 18(2):88–96

36.   Nguyen KA, Peer N, Villiers de, A, Mukasa B, Matsha TE, et al. (2017) Optimal waist circumference threshold for diagnosing metabolic syndrome in African people living with HIV infection. PLoS ONE [Electronic Resource] 12(9):e0183029

37.   Katchunga PB, Hermans M, Bamuleke BA, Katoto PC, Kabinda JM (2013) Relationship between waist circumference, visceral fat and metabolic syndrome in a Congolese community: further research is still to be undertaken. The Pan African medical journal 14:20

38.   Magalhaes P, Capingana DP, Mill JG (2014) Prevalence of the metabolic syndrome and determination of optimal cut-off values of waist circumference in university employees from Angola. Cardiovascular Journal of Africa 25(1):27–33

39.   Onen CL (2017) Obesity in Botswana: time for new cut-off points for abdominal girth? Cardiovascular Journal of Africa 28(2):86–91

40. Pan S, Yu ZX, Ma YT, Liu F, Yang YN, Ma X, et al. (2013) Appropriate body mass index and waist circumference cutoffs for categorization of overweight and central adiposity among Uighur adults in Xinjiang. PLoS ONE [Electronic Resource] 8(11):e80185

41. Feng RN, Zhao C, Wang C, Niu YC, Li K, Guo FC, et al. (2012) BMI is strongly associated with hypertension, and waist circumference is strongly associated with type 2 diabetes and dyslipidemia, in northern Chinese adults. Journal of Epidemiology 22(4):317–23

42. He YH, Chen YC, Jiang GX, Huang HE, Li R, Li XY, et al. (2012) Evaluation of anthropometric indices for metabolic syndrome in Chinese adults aged 40 years and over. European Journal of Nutrition 51(1):81–7

43. Pan J, Wang M, Ye Z, Yu M, Shen Y, He Q, et al. (2016) Optimal cut-off levels of obesity indices by different definitions of metabolic syndrome in a southeast rural Chinese population. Journal of Diabetes Investigation 7(4):594–600

44. Liu J, Zeng X, Hong HG, Li Y, Fu P (2017) The association between body mass index and mortality among Asian peritoneal dialysis patients: A meta-analysis. PLoS ONE [Electronic Resource] 12(2):e0172369

45. Oakkar EE, Stevens J, Truesdale KP, Cai J (2015) BMI and all-cause mortality among Chinese and Caucasians: the People's Republic of China and the Atherosclerosis Risk in Communities Studies. Asia Pacific Journal of Clinical Nutrition 24(3):472–9

46. Mirrakhimov AE, Lunegova OS, Kerimkulova AS, Moldokeeva CB, Nabiev MP, Mirrakhimov EM (2012) Cut off values for abdominal obesity as a criterion of metabolic syndrome in an ethnic Kyrgyz population (Central Asian region). Cardiovascular Diabetology 11:16

47. Guan X, Sun G, Zheng L, Hu W, Li W, Sun Y (2016) Associations between metabolic risk factors and body mass index, waist circumference, waist-to-height ratio and waist-to-hip ratio in a Chinese rural population. Journal of Diabetes Investigation 7(4):601–6

48. Guo H, Liu J, Zhang J, Ma R, Ding Y, Zhang M, et al. (2016) The Prevalence of Metabolic Syndrome Using Three Different Diagnostic Criteria among Low Earning Nomadic Kazakhs in the Far Northwest of China: New Cut-Off Points of Waist Circumference to Diagnose MetS and Its Implications. PLoS ONE [Electronic Resource] 11(2):e0148976

49. He J, Ma R, Liu J, Zhang M, Ding Y, Guo H, et al. (2017) The Optimal Ethnic-Specific Waist-Circumference Cut-Off Points of Metabolic Syndrome among Low-Income Rural Uyghur Adults in Far Western China and Implications in Preventive Public Health. International Journal of Environmental Research & Public Health [Electronic Resource] 14(2):8

50. Gupta S, Kapoor S (2012) Optimal cut-off values of anthropometric markers to predict hypertension in North Indian population. Journal of Community Health 37(2):441–7

51. Bhowmik B, Munir SB, Diep LM, Siddiquee T, Habib SH, Samad MA, et al. (2013) Anthropometric indicators of obesity for identifying cardiometabolic risk factors in a rural Bangladeshi population. Journal of Diabetes Investigation 4(4):361–8

52. Pratyush DD, Tiwari S, Singh S, Singh SK (2012) Waist circumference cutoff and its importance for diagnosis of metabolic syndrome in Asian Indians: A preliminary study. Indian Journal of Endocrinology and Metabolism 16(1):112–5

53. Tsukiyama H, Nagai Y, Matsubara F, Shimizu H, Iwamoto T, Yamanouchi E, et al. (2016) Proposed cut-off values of the waist circumference for metabolic syndrome based on visceral fat volume in a Japanese population. Journal of Diabetes Investigation 7(4):587–93

54. Chu FL, Hsu CH, Jeng C (2012) Low predictability of anthropometric indicators of obesity in metabolic syndrome (MS) risks among elderly women. Archives of Gerontology & Geriatrics 55(3):718–23

55. Hong S, Yi SW, Sull JW, Hong JS, Jee SH, Ohrr H (2015) Body mass index and mortality among Korean elderly in rural communities: Kangwha Cohort Study. PLoS ONE [Electronic Resource] 10(2):e0117731

56. Kim HR, Kim HS (2017) Optimal Cutoffs of Cardiometabolic Risk for Postmenopausal Korean Women. Asian Nursing Research 11(2):107–12

57. Cheong KC, Yusoff AF, Ghazali SM, Lim KH, Selvarajah S, Haniff J, et al. (2013) Optimal BMI cut-off values for predicting diabetes, hypertension and hypercholesterolaemia in a multi-ethnic population. Public Health Nutrition 16(3):453–9

58. Cheong KC, Ghazali SM, Hock LK, Yusoff AF, Selvarajah S, Haniff J, et al. (2014) Optimal waist circumference cut-off values for predicting cardiovascular risk factors in a multi-ethnic Malaysian population. Obesity Research & Clinical Practice 8(2):e154-62

59. Manjavong M, Limpawattana P, Rattanachaiwong S, Mairiang P, Reungjui S (2017) Utility of body mass index and neck circumference to screen for metabolic syndrome in Thai people. Asian Biomedicine 11(1):55–63

60. Pagsisihan DA, Sandoval MA, Paz-Pacheco E, Jimeno C (2016) Low indices of overweight and obesity are associated with cardiometabolic diseases among adult filipinos in a rural community. Journal of the ASEAN Federation of Endocrine Societies 31(2):97–105

61. Chen BD, He CH, Ma YT, Yang YN, Liu F, Pan S, et al. (2014) Best anthropometric and atherogenic predictors of metabolic syndrome in the chinese han population in xinjiang: The cardiovascular risk survey. Annals of Nutrition and Metabolism 65(4):280–8

62. Fan H, Li X, Zheng L, Chen X, Lan Q, Wu H, et al. (2016) Abdominal obesity is strongly associated with Cardiovascular Disease and its Risk Factors in Elderly and very Elderly Community-dwelling Chinese. Scientific Reports 6:21521

63. Ren Q, Su C, Wang H, Wang Z, Du W, Zhang B (2016) Prospective Study of Optimal Obesity Index Cut-Off Values for Predicting Incidence of Hypertension in 18-65-Year-Old Chinese Adults. PLoS ONE [Electronic Resource] 11(3):e0148140

64. Yang H, Xin Z, Feng JP, Yang JK (2017) Waist-to-height ratio is better than body mass index and waist circumference as a screening criterion for metabolic syndrome in Han Chinese adults. Medicine 96(39):e8192

65. Zhang J, Fang L, Qiu L, Huang L, Zhu W, Yu Y (2017) Comparison of the ability to identify arterial stiffness between two new anthropometric indices and classical obesity indices in Chinese adults. Atherosclerosis 263:263–71

66. Caminha TC, Ferreira HS, Costa NS, Nakano RP, Carvalho RE, Xavier AF, et al. (2017) Waist-to-height ratio is the best anthropometric predictor of hypertension: A population-based study with women from a state of northeast of Brazil. Medicine 96(2):e5874