

**UNIVERSITY OF BIRMINGHAM AND YORK HEALTH  
ECONOMICS CONSORTIUM**

**(National Collaborating Centre for Indicator Development)**

**Health economic report on piloted indicators**

**Pilot QOF indicator:** The percentage of patients with coronary heart disease, stroke or TIA, diabetes, hypertension, peripheral arterial disease, heart failure, COPD, asthma, osteoarthritis and/or rheumatoid arthritis who have had a BMI recorded in the preceding 12 months

**Potential output:** Recommendations for NICE Menu

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## Introduction and economic rationale for the indicator

This briefing paper presents a cost-effectiveness analysis of the following potential indicator from pilot 9 of the NICE Quality and Outcomes Framework (QOF) indicator development programme:

***The percentage of patients with coronary heart disease, stroke or TIA, diabetes, hypertension, peripheral arterial disease, heart failure, COPD, asthma, osteoarthritis and/or rheumatoid arthritis who have had a BMI recorded in the preceding 12 months.***

The economic analysis is based on evidence of delivery costs and evidence of benefits expressed as quality-adjusted life years (QALYs). Additionally, the economic analysis takes account of potential QOF payments based on a range of available QOF points and a range of levels of achievement.

The possible range of QOF points for this analysis was agreed with the economic subgroup of the NICE Advisory Committee on Indicator Development prior to the analysis being undertaken.

A net benefit approach is used whereby an indicator is considered cost-effective when net benefit is greater than zero for any given level of achievement and available QOF points:

$$\text{Net benefit} = \text{monetised benefit} - \text{delivery cost} - \text{QOF payment.}$$

The benefits and costs are reported per patient and the QOF payments per practice in the report, but for analysis purposes, these are all aggregated to the national (England) level to ensure consistency.

For this indicator, the net benefit analysis is applied with a 12 month time horizon at baseline.

The objective is to evaluate whether the proposed indicator represents a cost-effective use of NHS resources. This report provides the Advisory Committee with information on whether the indicator is economically justifiable and will inform the Committee's decision making on recommendations about the indicator.

There are various estimates of the cost to the NHS of people being overweight and obese which indicate it as a significant burden to the health system. For example, in 2007 it was estimated that the NHS spent £17.4bn on diseases where elevated BMI was a risk factor [1].

The NICE public health guidance on obesity in adults recommends that patients with a BMI over 30, particularly those with other risk factors such as Type 2 diabetes, can benefit from funded lifestyle weight management services providing there is capacity [2]. Individual guidance for each of the above conditions does not always explicitly recommend measuring BMI, although all mention some element of lifestyle modification. The basis of this report is the public health guidance recommendation on weight management services.

This potential QOF indicator would incentivise the recording of BMI in people with the identified conditions. While the recording of BMI is recommended by the NICE guidance (and therefore cost-effectiveness will have been taken into account), this report considers the cost-effectiveness of this intervention when QOF achievement payments are also taken into account.

It is noted that the QOF currently incentivises practices to establish and maintain a register of patients aged 18 years or over with a BMI  $\geq 30$  in the preceding 12 months (indicator OB002 which is worth 8 QOF points).

Summary of assumptions:

- The basis of this report is the public health guidance recommendation on weight management services;
- 25% of the indicator population are obese (BMI $\geq$ 30);
- 75% of obese patients will accept a referral for a lifestyle intervention;
- Assessment of BMI is done by GPs and takes 10 minutes with a further 10 minutes of advice and/or making a referral to a lifestyle intervention for those who are obese;
- Benefits of lifestyle intervention are a 1 point BMI reduction maintained for one year.

## **Evidence on Delivery Cost of Indicator**

In costing the indicator a number of working assumptions have been made:

- Although it is acknowledged that the distribution of high BMI scores in the population with the specific conditions referred to in the indicator could be higher than in the general population, the general population rate of BMI scores  $\geq$ 30 has been used as the baseline for this analysis. Sensitivity analysis has been used to explore likely increases in the rate amongst the indicator population;
- There is a one-off cost for all patients in measuring BMI that is the same regardless of condition;
- Capacity limitations are such that only those with BMI $\geq$ 30 are referred to lifestyle management services;
- The cost of delivering the indicator relates to the recording of the BMI and the cost of patients where BMI $\geq$ 30 who accept a referral to a lifestyle service for weight management.

*Prevalence of BMI in people with relevant conditions*

A published study from 2013 showed the proportion of adults aged 20 or over with BMI $\geq$ 30 to be 25% in the UK [3]. Our working assumption is that the proportion of patients with BMI $\geq$ 30 is the same for the population with the conditions included in the indicator as it is for the total population. This has been used in the base case analysis but it is recognised that the proportion of high BMI scores could be greater in patients with the conditions included in the indicator, particularly those with diabetes. As such sensitivity analysis has been used to explore the threshold at which point the percentage of patients with BMI $\geq$ 30 changes any conclusions reached by the analysis (i.e. at what obesity prevalence the indicator becomes cost effective if it is cost ineffective in the baseline analysis and vice versa).

*Annual cost of measuring BMI and referring patients*

The cost of measuring BMI has been assumed to be part of routine health checks for patients rather than a one-off specific appointment. It has been assumed that the health check will be done by a GP and that it will take 10 minutes to explain why calculating BMI is important, weighing and measuring the height of the patient and calculating the BMI.

If BMI is  $\geq$ 30 it has been assumed the GP will take a further 10 minutes to explain the programmes that are available and to make a referral. That will also include time spent talking through the importance of managing weight for those who do not wish to accept a referral.

In some settings it may be the practice nurse who undertakes the measurements and makes the referral. For a conservative approach it has been assumed that a GP undertakes this activity. If the indicator is found to be cost effective with a GP undertaking this activity it will also be cost effective if a less costly healthcare professional undertakes it.

The unit cost of GP time for a 17.2 minute consultation is £67 [4] and this was used as the basis of the calculation of the cost of a 10 minute or 20 minute appointment.

Assuming 25% of patients have a BMI $\geq$ 30, the annual cost per patient of BMI measurement, the cost of assessment and then referral or advice as necessary is £48.69.  $((£67/17.2 \times 10 \times 0.75) + (£67/17.2 \times 20 \times 0.25))$ .

#### *Cost of delivering an intervention*

The public health guideline on obesity reported an underlying exploratory economic analysis that estimated the costs of lifestyle intervention as being in the region of £100 [2]. This varied between programmes but was usually less than £100.

A targeted literature search identified a health technology assessment (HTA) on bariatric surgery for obesity that had as a comparator a diet programme delivered on an individual rather than group basis. The individual diet programme cost between £250 and £2,800 depending on whether medication and dietary supplements were also given [5]. However, the intervention envisaged for a patient in the NICE public health guideline [2] is a low level solely lifestyle intervention, probably in a group setting.

It has been assumed the cost of delivering the intervention to be the lower estimate of dietary programme costs from the bariatric surgery guideline ie. £250 per patient. For a conservative estimate, no cost savings from reductions in healthcare resource usage were assumed should people lose weight. In the absence of evidence, a working assumption was adopted that 75% of patients referred will accept the referral. Threshold analysis was used to see at which point the percentage of patients accepting referral changes any conclusions reached by the analysis (i.e. at what percentage of patients accepting referral the indicator becomes cost effective if it is cost ineffective in the baseline analysis and vice versa).

The intervention cost for the indicator is therefore assumed to be £46.88. This calculated from £250 (intervention cost) x 25% (likelihood that an eligible person has BMI<=30) x 75% (assumption about proportion with BMI<+30 who accept lifestyle intervention).

*Total cost of indicator*

The total cost of the indicator per patient is equal to £95.57. This is calculated as £48.69 (the cost of initial assessment and advice or referral for people with the relevant conditions) plus £46.88 intervention cost for people whose BMI is 30 or higher.

Sensitivity analysis examined the impact of the costs of the indicator per patient being 50% higher and lower than those assumed at baseline.

Baseline costs

- The baseline cost of BMI measurement and referral and delivery of a lifestyle intervention is £95.57 per patient (£48.69 for the cost of initial assessment and advice or referral for people with the relevant conditions, plus £46.88 intervention cost for people whose BMI is 30 or higher);
- Although there will be some newly diagnosed patients each year, as this will be an annual indicator, it is likely that the intervention will need to be repeated for a relatively fixed cohort each year. This may lead to changes in uptake of the intervention and changes in the levels of obesity.

**Evidence on the Benefits of the Indicator**

Evidence from the NICE public health guideline on obesity [2] suggests that the average weight loss from a lifestyle intervention is in the region of 2.7kg over 12 months.

Utility values for weight loss are focussed around changes in BMI. A 2.7kg weight loss in BMI terms depends on the height of an individual. For an average man in the UK (1.75cm) a 2.7kg weight loss equals a loss of 0.9 BMI points and for an average woman (1.61cm), a loss of 1.1 BMI points. As a working assumption it has been assumed that the weight loss from lifestyle intervention programmes is 1 BMI point that is sustained for exactly 12 months. For a conservative estimate no benefit has been assumed during the time where weight is lost up to the one BMI point. Similarly, no benefit has been assumed during the time when weight is lower than the starting weight but is returning to the starting weight. The benefit is therefore equivalent to an instantaneous loss of one BMI point maintained for exactly one year followed by an instantaneous gain of one BMI point.

Utility values for a one point reduction in BMI were taken from the bariatric surgery HTA [5]. This found published values to suggest a 1 BMI point reduction for patients with diabetes would generate a utility gain of 0.0285 over one year. It has been assumed that this utility gain is the same for all conditions included in this indicator. As we assume the BMI reduction lasts for one year this utility value translates into a QALY gain of 0.0285 from a lifestyle intervention.

Assuming 25% of patients are obese and 75% of these accept a referral, this equates to a potential QALY gain per patient from the indicator in the base case of 0.00534. This assumes that there is no additional gain from people who may receive advice in the GP surgery, who do not take up the lifestyle intervention. Sensitivity analysis examined QALY gains 50% higher and lower than those assumed in the base case.

Baseline benefits

- The baseline QALY gain of BMI measurement and referral and delivery of a lifestyle intervention is 0.00534 per patient for one year;
- This represents the benefit of a one point BMI reduction for obese patients who attend a lifestyle programme.

## Eligible Population

The eligible population (i.e. people who would make up the indicator denominator) are all those that have any of the conditions in the indicator, less any patients that for clinical reasons have been exception reported from the indicator denominator.

Data aggregated across 25 pilot practices showed the denominator, after exception reporting, equalled 24.85% of the total population in those 25 practices.

As a check on the validity of this number, the raw prevalence rates for each of the target conditions of the indicator in England in 2013/14 from QOF registers was as follows:

- Coronary heart disease: 3.29%;
- Stroke or TIA: 1.72%;
- Diabetes: 6.21%;
- Hypertension: 13.73%;
- Peripheral arterial disease: 0.64%;
- Heart failure: 0.71%;
- COPD: 1.78%;
- Asthma: 5.93%;
- Osteoarthritis and/or rheumatoid arthritis: 0.98%.

Adding these prevalence rates together indicates that if each patient only had one condition then the maximum eligible population could be 34.99%. Conversely, the minimum eligible population would be 13.73% if it was assumed that patients with hypertension accounted for all the other comorbidities. Both situations are unlikely but the estimate of 24.85% from the pilot practices looks reasonable and so was used in the base case analysis. The minimum possible population (13.73%) and maximum possible population (34.79%) suggested by the individual disease registers were used in sensitivity analysis.

### **Baseline Level of Achievement**

Pilot 9 data showed that just over 48.5% of patients were already achieving the indicator at baseline. Pilot achievement may not reflect a 12 month level of achievement as the pilot only examines activity over a short time period (three months).

### **Population**

In the base case, the economic analysis was based on the total practice population registered with practices in England, that is, 7,962 practices with an average practice size of 7,034 [9].

Table 1: Practice information for UK countries, 2013

| <b>Country</b>   | <b>Number of practices</b> | <b>Number of patients</b> |
|------------------|----------------------------|---------------------------|
| England          | 7,962                      | 7,034                     |
| Scotland         | 988                        | 5,622                     |
| Wales            | 470                        | 6,762                     |
| Northern Ireland | 351                        | 5,467                     |

## **QOF Payments**

Each QOF point is assumed to result in a payment of £160.12. This is the value per point in England during 2015/16 (source: NHS Employers).

## **Value of a QALY**

The expected QALY gain from implementing this indicator was costed at £20,000 per QALY. This is based on the bottom of the range £20,000 to £30,000, below which NICE generally considers an intervention to be cost-effective.

So if BMI measurement, referral and delivery of a lifestyle intervention gives a QALY gain of 0.0053, the value of this QALY gain per patient is £106.80 (0.0053 x £20,000).

## **QOF Points**

The economic analysis considers the cost-effectiveness of incentivising the proposed activity over a range of QOF points.

The current QOF includes an indicator in relation to establishing a register of patients with BMI  $\geq 30$  (OB001). This is worth 8 points so measuring BMI in patients with the conditions referred to in the indicator is already incentivised, albeit through the measurement of BMI in all patients. In 2014/15 the serious mental illness indicator MH006 was retired. This related to the recording of BMI for patients with schizophrenia, bipolar disorder and other psychoses and was worth 4 points.

A baseline allocation of 4 points has been used to additionally incentivise patients with the conditions referred to in the indicator, in line points formerly available for MH006.

Sensitivity analysis explored the lower and upper bounds of 2 and 10 points respectively, as agreed with the economic subgroup of the Advisory Committee on Indicator Development.

## **Thresholds**

Piloting indicated that achievement of the indicator is already above the 45% baseline usually suggested, possibly due to the presence of OB001. As such, a threshold range of 50% to 80% was used, with an upper bound consistent with other indicators in the QOF.

## **Results (assuming a value per QALY of £20,000)**

Under the baseline assumptions of incremental delivery cost (£95.57), incremental benefit (0.0053 QALYs with a value of £20,000 per QALY) and eligible population (24.85%), the net benefit analysis suggests that the indicator is cost-effective, with QOF payments at the base case of 4 points justifiable on economic grounds (Appendix A). Under the conservative modelling assumptions in the base case, the value of the increase in quality of life from reduced weight offered by a lifestyle intervention for obese patients outweighs the additional costs of measuring the patient's BMI and the costs of undertaking the intervention.

However, this result is sensitive to a 50% increase in cost (Appendix B) and a 50% reduction in QALY gains per patient (Appendix C). The percentage of patients eligible for the indicator could change significantly from the baseline without influencing results (Appendix D).

The indicator continues to be cost effective at the base case at 80% achievement up to 38 points, or at 4 points if:

- The value per QALY is reduced 9.4% to £18,115;
- Intervention costs per patient are increased by 10.5% to £105.64;
- The QALY gain per patient reduces by 10.1% to 0.0048;
- The eligible population reduces by 89.6% to 2.6%.

Further analysis showed that if the patients accepting referral fell from 75% to 61.9% or the percentage of obese patients fell from 25% to 20% the indicator would cease to be cost effective. This shows that the greater the percentage of patients eligible for the indicator who are obese the more cost effective the indicator becomes.

### **Discussion and issues for consideration by the Committee**

Under the baseline assumptions in this analysis there is economic evidence that the 4 points suggested for the indicator are cost-effective. However, the findings are sensitive to quite small reductions in QALY gains. If weight loss is assumed to last on average about 11 months rather than one year then the indicator no longer becomes cost effective at 4 points.

It is, therefore, important to stress that the economic evidence presented is not highly conclusive. It is very much dependent on the robustness of the assumptions that underpin the modelling and the scope of the analysis does not permit more complex modelling.

This report sets out some issues for consideration by the Committee:

- The indicator only incentivises BMI recording. The assumption has been made that a referral would be made for anyone with BMI  $\geq 30$ , but this is not incentivised through the indicator.

- The indicator is an annual indicator, i.e. all people with these conditions should have their BMI recorded each year. While there will be some new people with these conditions each year, there will be a significant number of people who will have their BMI recorded each year, so it is important to consider what the year-on-year effect of the indicator is.
- The costs of lifestyle or weight management schemes could be significantly higher and costs only need to be 10.5% higher for the indicator to no longer be cost effective at 4 points. However, guidelines on obesity suggest they could also be lower than the £250 assumed in this analysis. Costs would also be lower if a practice nurse carried out the assessment and referral rather than a GP.
- Baseline QALY gains were a conservative estimate as weight loss benefits were only assumed for one year and, importantly, did not include QALY gains from reductions in obesity-related conditions. The findings are, however, sensitive to small changes in the QALY gains assumed, e.g. a small reduction in the numbers of people accepting a referral.
- The findings are only sensitive to the percentage of patients who are obese if the proportion of patients in the population with the conditions referred to in the indicator who are obese is lower than that of the general population by about 20%. Given that patients with these conditions are more likely to be obese than people without diabetes, the assumptions made on the prevalence of obesity should not impact on the results.
- It is noted that the QOF currently incentivises practices to establish and maintain a register of patients aged 18 years or over with a BMI  $\geq 30$  in the preceding 12 months (indicator OB002 which is worth 8 QOF points).

On balance, from an indicator cost perspective, the cost-effectiveness findings would hold if the lifestyle intervention was low intensity, probably delivered in a group setting and if the intervention is genuinely one of lifestyle modification rather than a pharmacological or meal replacement intervention. However, the results are heavily dependent on the assumptions made in the modelling so the results need to be treated with caution.

## References

- [1] Loveman E, Frampton GK, Shepherd J, Picot J, Cooper K, Bryant J, et al . The clinical effectiveness and cost-effectiveness of long-term weight management schemes for adults: a systematic review. *Health Technol Assess* 2011;15 (2).
- [2] National Institute for Health and Care Excellence. Public Health Guideline 53: Managing overweight and obesity in adults. 2014.
- [3] Ng M, Fleming T, Robinson M, Thomson B, Graetz N, Margono C, Mullany EC, Biryukov S, Abbafati C, Abera SF et al. Global, regional, and national prevalence of overweight and obesity in children and adults during 1980-2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet* 2014 Aug 30;384(9945):766-81
- [4] PSSRU. Unit Costs of Health and Social Care. 2014.
- [5] Picot J, Jones J, Colquitt JL, Gospodarska E, Loveman E, Baxter L, et al. The clinical effectiveness and cost-effectiveness of bariatric (weight loss) surgery for obesity: a systematic review and economic evaluation. *Health Technol Assess* 2009;13(41).
- [6] General practice trends in the UK. NHS Information Centre. Published 31 October 2014.

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**Appendix A: Net benefit analysis - Base case analysis**

**Pilot 2 BMI measurement (patients with comorbidities)**

|                          |         |   |         |
|--------------------------|---------|---|---------|
| Value per point achieved | £160.12 | Societal value of a QALY                            | £20,000 |
| Number of practices      | 7,962   |   |         |
| Mean practice population | 7,034   |   |         |
| Minimum threshold        | 50%     | <b>Baseline achievement</b>                         |         |
| Maximum threshold        | 80%     | Eligible population (mean % of practice population) | 24.85%  |
|                          |         | Baseline achievement (mean % of eligible patients)  | 48.5%   |
|                          |         | <b>Cost-effectiveness estimates</b>                 |         |
|                          |         | Incremental cost (£ per patient)                    | 95.57   |
|                          |         | Incremental effect (QALYs per patient)              | 0.0053  |

|        |   |   |   |   |   |   |   |   |    |
|--------|---|---|---|---|---|---|---|---|----|
| Points | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------|---|---|---|---|---|---|---|---|----|

| National totals      |                      |          |          |          |          |          |          |          |          |          |                              |                 |
|----------------------|----------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|------------------------------|-----------------|
| Expected Achievement | QOF payments (£000s) |          |          |          |          |          |          |          |          |          | Change in treatment cost (£) | Change in QALYs |
| 30%                  | £0                   | £0       | £0       | £0       | £0       | £0       | £0       | £0       | £0       | £0       | -£246,061,827                | -13646          |
| 35%                  | £0                   | £0       | £0       | £0       | £0       | £0       | £0       | £0       | £0       | £0       | -£179,558,631                | -9958           |
| 40%                  | £0                   | £0       | £0       | £0       | £0       | £0       | £0       | £0       | £0       | £0       | -£113,055,434                | -6270           |
| 45%                  | £0                   | £0       | £0       | £0       | £0       | £0       | £0       | £0       | £0       | £0       | -£46,552,238                 | -2582           |
| 50%                  | £0                   | £0       | £0       | £0       | £0       | £0       | £0       | £0       | £0       | £0       | £19,950,959                  | 1106            |
| 55%                  | £425                 | £637     | £850     | £1,062   | £1,275   | £1,487   | £1,700   | £1,912   | £2,125   | £2,338   | £86,454,156                  | 4794            |
| 60%                  | £850                 | £1,275   | £1,700   | £2,125   | £2,550   | £2,975   | £3,400   | £3,825   | £4,250   | £4,675   | £152,957,352                 | 8483            |
| 65%                  | £1,275               | £1,912   | £2,550   | £3,187   | £3,825   | £4,462   | £5,100   | £5,737   | £6,374   | £7,012   | £219,460,549                 | 12171           |
| 70%                  | £1,700               | £2,550   | £3,400   | £4,250   | £5,100   | £5,949   | £6,799   | £7,649   | £8,499   | £9,348   | £285,963,745                 | 15859           |
| 75%                  | £2,125               | £3,187   | £4,250   | £5,312   | £6,374   | £7,437   | £8,499   | £9,562   | £10,624  | £11,687  | £352,466,942                 | 19547           |
| 80%                  | £2,550               | £3,825   | £5,100   | £6,374   | £7,649   | £8,924   | £10,199  | £11,474  | £12,749  | £14,024  | £418,970,138                 | 23235           |
| 85%                  | £2,550               | £3,825   | £5,100   | £6,374   | £7,649   | £8,924   | £10,199  | £11,474  | £12,749  | £14,024  | £485,473,335                 | 26923           |
| 90%                  | £2,550               | £3,825   | £5,100   | £6,374   | £7,649   | £8,924   | £10,199  | £11,474  | £12,749  | £14,024  | £551,976,531                 | 30611           |
| 95%                  | £2,550               | £3,825   | £5,100   | £6,374   | £7,649   | £8,924   | £10,199  | £11,474  | £12,749  | £14,024  | £618,479,728                 | 34299           |
| 100%                 | £2,550               | £3,825   | £5,100   | £6,374   | £7,649   | £8,924   | £10,199  | £11,474  | £12,749  | £14,024  | £684,982,924                 | 37987           |
| Net Benefit (£000s)  |                      |          |          |          |          |          |          |          |          |          |                              |                 |
| 30%                  | -£26,854             | -£26,854 | -£26,854 | -£26,854 | -£26,854 | -£26,854 | -£26,854 | -£26,854 | -£26,854 | -£26,854 |                              |                 |
| 35%                  | -£19,596             | -£19,596 | -£19,596 | -£19,596 | -£19,596 | -£19,596 | -£19,596 | -£19,596 | -£19,596 | -£19,596 |                              |                 |
| 40%                  | -£12,338             | -£12,338 | -£12,338 | -£12,338 | -£12,338 | -£12,338 | -£12,338 | -£12,338 | -£12,338 | -£12,338 |                              |                 |
| 45%                  | -£5,080              | -£5,080  | -£5,080  | -£5,080  | -£5,080  | -£5,080  | -£5,080  | -£5,080  | -£5,080  | -£5,080  |                              |                 |
| 50%                  | £2,177               | £2,177   | £2,177   | £2,177   | £2,177   | £2,177   | £2,177   | £2,177   | £2,177   | £2,177   |                              |                 |
| 55%                  | £9,010               | £8,798   | £8,585   | £8,373   | £8,160   | £7,948   | £7,735   | £7,523   | £7,310   | £7,098   |                              |                 |
| 60%                  | £15,843              | £15,418  | £14,993  | £14,568  | £14,143  | £13,718  | £13,293  | £12,868  | £12,443  | £20,000  |                              |                 |
| 65%                  | £22,676              | £22,038  | £21,401  | £20,764  | £20,126  | £19,489  | £18,851  | £18,214  | £17,576  | £16,939  |                              |                 |
| 70%                  | £29,509              | £28,659  | £27,809  | £26,959  | £26,109  | £25,259  | £24,409  | £23,559  | £22,709  | £21,859  |                              |                 |
| 75%                  | £36,342              | £35,279  | £34,217  | £33,154  | £32,092  | £31,030  | £29,967  | £28,905  | £27,842  | £26,780  |                              |                 |
| 80%                  | £43,174              | £41,900  | £40,625  | £39,350  | £38,075  | £36,800  | £35,525  | £34,250  | £32,975  | £31,700  |                              |                 |
| 85%                  | £50,006              | £49,157  | £47,882  | £46,608  | £45,333  | £44,058  | £42,783  | £41,508  | £40,233  | £38,958  |                              |                 |
| 90%                  | £57,690              | £56,415  | £55,140  | £53,865  | £52,591  | £51,316  | £50,041  | £48,766  | £47,491  | £46,216  |                              |                 |
| 95%                  | £64,948              | £63,673  | £62,398  | £61,123  | £59,848  | £58,573  | £57,298  | £56,024  | £54,749  | £53,474  |                              |                 |
| 100%                 | £72,206              | £70,931  | £69,656  | £68,381  | £67,106  | £65,831  | £64,556  | £63,282  | £62,007  | £60,732  |                              |                 |

Where the net benefit produces a non-negative outcome then it is cost effective for the NHS to adopt the indicator.

When this is the case, the cells are highlighted with a yellow background.



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**Appendix C: Net benefit analysis – QALY benefit decreased by 50%**  
**Pilot 2 BMI measurement (patients with comorbidities)**

|                          |         |   |         |
|--------------------------|---------|---|---------|
| Value per point achieved | £160.12 | Societal value of a QALY                            | £20,000 |
| Number of practices      | 7,962   |   |         |
| Mean practice population | 7,034   |   |         |
| Minimum threshold        | 50%     | <b>Baseline achievement</b>                         |         |
| Maximum threshold        | 80%     | Eligible population (mean % of practice population) | 24.85%  |
|                          |         | Baseline achievement (mean % of eligible patients)  | 48.5%   |
|                          |         | <b>Cost-effectiveness estimates</b>                 |         |
|                          |         | Incremental cost (£ per patient)                    | 95.57   |
|                          |         | Incremental effect (QALYs per patient)              | 0.0027  |

|        |   |   |   |   |   |   |   |   |    |
|--------|---|---|---|---|---|---|---|---|----|
| Points | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------|---|---|---|---|---|---|---|---|----|

| National totals      |                      |        |        |        |        |        |         |         |         |                              |                 |               |               |       |
|----------------------|----------------------|--------|--------|--------|--------|--------|---------|---------|---------|------------------------------|-----------------|---------------|---------------|-------|
| Expected Achievement | QOF payments (£000s) |        |        |        |        |        |         |         |         | Change in treatment cost (£) | Change in QALYs |               |               |       |
| 30%                  | £0                   | £0     | £0     | £0     | £0     | £0     | £0      | £0      | £0      | £0                           | £0              | -£246,061,827 | -6823         |       |
| 35%                  | £0                   | £0     | £0     | £0     | £0     | £0     | £0      | £0      | £0      | £0                           | £0              | £0            | -£179,558,631 | -4979 |
| 40%                  | £0                   | £0     | £0     | £0     | £0     | £0     | £0      | £0      | £0      | £0                           | £0              | £0            | -£113,055,434 | -3135 |
| 45%                  | £0                   | £0     | £0     | £0     | £0     | £0     | £0      | £0      | £0      | £0                           | £0              | £0            | -£46,552,238  | -1291 |
| 50%                  | £0                   | £0     | £0     | £0     | £0     | £0     | £0      | £0      | £0      | £0                           | £0              | £0            | £19,950,959   | 553   |
| 55%                  | £425                 | £637   | £850   | £1,062 | £1,275 | £1,487 | £1,700  | £1,912  | £2,125  | £2,338                       | £2,550          | £86,454,156   | 2397          |       |
| 60%                  | £850                 | £1,275 | £1,700 | £2,125 | £2,550 | £2,975 | £3,400  | £3,825  | £4,250  | £4,675                       | £5,100          | £152,957,352  | 4241          |       |
| 65%                  | £1,275               | £1,912 | £2,550 | £3,187 | £3,825 | £4,462 | £5,100  | £5,737  | £6,374  | £7,012                       | £7,649          | £219,460,549  | 6085          |       |
| 70%                  | £1,700               | £2,550 | £3,400 | £4,250 | £5,100 | £5,949 | £6,799  | £7,649  | £8,499  | £9,348                       | £10,199         | £285,963,745  | 7929          |       |
| 75%                  | £2,125               | £3,187 | £4,250 | £5,312 | £6,374 | £7,437 | £8,499  | £9,562  | £10,624 | £11,687                      | £12,749         | £352,466,942  | 9773          |       |
| 80%                  | £2,550               | £3,825 | £5,100 | £6,374 | £7,649 | £8,924 | £10,199 | £11,474 | £12,749 | £14,024                      | £15,299         | £418,970,138  | 11617         |       |
| 85%                  | £2,550               | £3,825 | £5,100 | £6,374 | £7,649 | £8,924 | £10,199 | £11,474 | £12,749 | £14,024                      | £15,299         | £485,473,335  | 13461         |       |
| 90%                  | £2,550               | £3,825 | £5,100 | £6,374 | £7,649 | £8,924 | £10,199 | £11,474 | £12,749 | £14,024                      | £15,299         | £551,976,531  | 15305         |       |
| 95%                  | £2,550               | £3,825 | £5,100 | £6,374 | £7,649 | £8,924 | £10,199 | £11,474 | £12,749 | £14,024                      | £15,299         | £618,479,728  | 17149         |       |
| 100%                 | £2,550               | £3,825 | £5,100 | £6,374 | £7,649 | £8,924 | £10,199 | £11,474 | £12,749 | £14,024                      | £15,299         | £684,982,924  | 18993         |       |

| Net Benefit (£000s) |           |           |           |           |           |           |           |           |           |           |           |           |           |
|---------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 30%                 | £109,604  | £109,604  | £109,604  | £109,604  | £109,604  | £109,604  | £109,604  | £109,604  | £109,604  | £109,604  | £109,604  | £109,604  | £109,604  |
| 35%                 | £79,981   | £79,981   | £79,981   | £79,981   | £79,981   | £79,981   | £79,981   | £79,981   | £79,981   | £79,981   | £79,981   | £79,981   | £79,981   |
| 40%                 | £50,359   | £50,359   | £50,359   | £50,359   | £50,359   | £50,359   | £50,359   | £50,359   | £50,359   | £50,359   | £50,359   | £50,359   | £50,359   |
| 45%                 | £20,736   | £20,736   | £20,736   | £20,736   | £20,736   | £20,736   | £20,736   | £20,736   | £20,736   | £20,736   | £20,736   | £20,736   | £20,736   |
| 50%                 | £-8,887   | £-8,887   | £-8,887   | £-8,887   | £-8,887   | £-8,887   | £-8,887   | £-8,887   | £-8,887   | £-8,887   | £-8,887   | £-8,887   | £-8,887   |
| 55%                 | £-38,934  | £-39,147  | £-39,359  | £-39,572  | £-39,784  | £-39,997  | £-40,209  | £-40,422  | £-40,634  | £-40,847  | £-41,059  | £-41,272  | £-41,484  |
| 60%                 | £-68,982  | £-69,407  | £-69,832  | £-70,257  | £-70,682  | £-71,107  | £-71,532  | £-71,957  | £-72,382  | £-72,807  | £-73,232  | £-73,657  | £-74,082  |
| 65%                 | £-99,030  | £-99,667  | £-100,305 | £-100,942 | £-101,580 | £-102,217 | £-102,854 | £-103,492 | £-104,129 | £-104,767 | £-105,404 | £-106,042 | £-106,679 |
| 70%                 | £-129,077 | £-129,927 | £-130,777 | £-131,627 | £-132,477 | £-133,327 | £-134,177 | £-135,027 | £-135,877 | £-136,727 | £-137,577 | £-138,427 | £-139,277 |
| 75%                 | £-159,125 | £-160,187 | £-161,250 | £-162,312 | £-163,375 | £-164,437 | £-165,499 | £-166,562 | £-167,624 | £-168,687 | £-169,750 | £-170,812 | £-171,875 |
| 80%                 | £-189,173 | £-190,448 | £-191,722 | £-192,997 | £-194,272 | £-195,547 | £-196,822 | £-198,097 | £-199,372 | £-200,647 | £-201,922 | £-203,197 | £-204,472 |
| 85%                 | £-218,795 | £-220,070 | £-221,345 | £-222,620 | £-223,895 | £-225,170 | £-226,445 | £-227,720 | £-228,995 | £-230,270 | £-231,545 | £-232,820 | £-234,095 |
| 90%                 | £-248,418 | £-249,693 | £-250,968 | £-252,243 | £-253,518 | £-254,793 | £-256,067 | £-257,342 | £-258,617 | £-259,892 | £-261,167 | £-262,442 | £-263,717 |
| 95%                 | £-278,041 | £-279,316 | £-280,591 | £-281,865 | £-283,140 | £-284,415 | £-285,690 | £-286,965 | £-288,240 | £-289,515 | £-290,790 | £-292,065 | £-293,340 |
| 100%                | £-307,664 | £-308,938 | £-310,213 | £-311,488 | £-312,763 | £-314,038 | £-315,313 | £-316,588 | £-317,863 | £-319,138 | £-320,413 | £-321,688 | £-322,963 |

Where the net benefit produces a non-negative outcome then it is cost effective for the NHS to adopt the indicator.

When this is the case, the cells are highlighted with a yellow background.

**CONFIDENTIAL**

**Appendix D: Net benefit analysis – Lower eligible population (13.73%)**

**Pilot 2023 BMI measurement (patients with comorbidities)**

|                          |         |   |         |
|--------------------------|---------|---|---------|
| Value per point achieved | £160.12 | Societal value of a QALY                            | £20,000 |
| Number of practices      | 7,962   |   |         |
| Mean practice population | 7,034   |   |         |
| Minimum threshold        | 50%     | <b>Baseline achievement</b>                         |         |
| Maximum threshold        | 80%     | Eligible population (mean % of practice population) | 13.73%  |
|                          |         | Baseline achievement (mean % of eligible patients)  | 48.5%   |
|                          |         | <b>Cost-effectiveness estimates</b>                 |         |
|                          |         | Incremental cost (£ per patient)                    | 95.57   |
|                          |         | Incremental effect (QALYs per patient)              | 0.0053  |

|               |   |   |   |   |   |   |   |   |    |
|---------------|---|---|---|---|---|---|---|---|----|
| <b>Points</b> | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------|---|---|---|---|---|---|---|---|----|

| National totals      |                      |        |        |        |        |        |         |         |         |                              |                 |               |              |              |              |       |
|----------------------|----------------------|--------|--------|--------|--------|--------|---------|---------|---------|------------------------------|-----------------|---------------|--------------|--------------|--------------|-------|
| Expected Achievement | QOF payments (£000s) |        |        |        |        |        |         |         |         | Change in treatment cost (£) | Change in QALYs |               |              |              |              |       |
| 30%                  | £0                   | £0     | £0     | £0     | £0     | £0     | £0      | £0      | £0      | £0                           | £0              | -£135,952,873 | -7540        |              |              |       |
| 35%                  | £0                   | £0     | £0     | £0     | £0     | £0     | £0      | £0      | £0      | £0                           | £0              | £0            | -£99,208,853 | -5502        |              |       |
| 40%                  | £0                   | £0     | £0     | £0     | £0     | £0     | £0      | £0      | £0      | £0                           | £0              | £0            | £0           | -£62,464,833 | -3464        |       |
| 45%                  | £0                   | £0     | £0     | £0     | £0     | £0     | £0      | £0      | £0      | £0                           | £0              | £0            | £0           | £0           | -£25,720,814 | -1426 |
| 50%                  | £0                   | £0     | £0     | £0     | £0     | £0     | £0      | £0      | £0      | £0                           | £0              | £0            | £0           | £0           | £11,023,206  | 611   |
| 55%                  | £425                 | £637   | £850   | £1,062 | £1,275 | £1,487 | £1,700  | £1,912  | £2,125  | £2,338                       | £2,550          | £2,763        | £2,975       | £3,188       | £47,767,226  | 2649  |
| 60%                  | £850                 | £1,275 | £1,700 | £2,125 | £2,550 | £2,975 | £3,400  | £3,825  | £4,250  | £4,675                       | £5,100          | £5,525        | £5,950       | £6,375       | £84,511,245  | 4687  |
| 65%                  | £1,275               | £1,912 | £2,550 | £3,187 | £3,825 | £4,462 | £5,100  | £5,737  | £6,375  | £7,012                       | £7,650          | £8,287        | £8,925       | £9,562       | £121,255,265 | 6724  |
| 70%                  | £1,700               | £2,550 | £3,400 | £4,250 | £5,100 | £5,949 | £6,799  | £7,649  | £8,499  | £9,349                       | £10,199         | £11,049       | £11,899      | £12,749      | £157,999,285 | 8762  |
| 75%                  | £2,125               | £3,187 | £4,250 | £5,312 | £6,374 | £7,437 | £8,499  | £9,562  | £10,624 | £11,687                      | £12,749         | £13,811       | £14,874      | £15,937      | £194,743,304 | 10800 |
| 80%                  | £2,550               | £3,825 | £5,100 | £6,374 | £7,649 | £8,924 | £10,199 | £11,474 | £12,749 | £14,024                      | £15,299         | £16,574       | £17,849      | £19,124      | £231,487,324 | 12838 |
| 85%                  | £2,550               | £3,825 | £5,100 | £6,374 | £7,649 | £8,924 | £10,199 | £11,474 | £12,749 | £14,024                      | £15,299         | £16,574       | £17,849      | £19,124      | £268,231,344 | 14875 |
| 90%                  | £2,550               | £3,825 | £5,100 | £6,374 | £7,649 | £8,924 | £10,199 | £11,474 | £12,749 | £14,024                      | £15,299         | £16,574       | £17,849      | £19,124      | £304,975,363 | 16913 |
| 95%                  | £2,550               | £3,825 | £5,100 | £6,374 | £7,649 | £8,924 | £10,199 | £11,474 | £12,749 | £14,024                      | £15,299         | £16,574       | £17,849      | £19,124      | £341,719,383 | 18951 |
| 100%                 | £2,550               | £3,825 | £5,100 | £6,374 | £7,649 | £8,924 | £10,199 | £11,474 | £12,749 | £14,024                      | £15,299         | £16,574       | £17,849      | £19,124      | £378,463,403 | 20988 |

| Net Benefit (£000s) |          |          |          |          |          |          |          |          |          |          |
|---------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 30%                 | £-14,837 | £-14,837 | £-14,837 | £-14,837 | £-14,837 | £-14,837 | £-14,837 | £-14,837 | £-14,837 | £-14,837 |
| 35%                 | £-10,827 | £-10,827 | £-10,827 | £-10,827 | £-10,827 | £-10,827 | £-10,827 | £-10,827 | £-10,827 | £-10,827 |
| 40%                 | £-6,817  | £-6,817  | £-6,817  | £-6,817  | £-6,817  | £-6,817  | £-6,817  | £-6,817  | £-6,817  | £-6,817  |
| 45%                 | £-2,807  | £-2,807  | £-2,807  | £-2,807  | £-2,807  | £-2,807  | £-2,807  | £-2,807  | £-2,807  | £-2,807  |
| 50%                 | £1,203   | £1,203   | £1,203   | £1,203   | £1,203   | £1,203   | £1,203   | £1,203   | £1,203   | £1,203   |
| 55%                 | £4,788   | £4,576   | £4,363   | £4,151   | £3,938   | £3,726   | £3,513   | £3,301   | £3,088   | £2,875   |
| 60%                 | £8,373   | £7,948   | £7,523   | £7,098   | £6,673   | £6,248   | £5,823   | £5,398   | £4,973   | £4,548   |
| 65%                 | £11,958  | £11,321  | £10,683  | £10,046  | £9,409   | £8,771   | £8,134   | £7,496   | £6,859   | £6,221   |
| 70%                 | £15,543  | £14,693  | £13,843  | £12,993  | £12,143  | £11,293  | £10,443  | £9,593   | £8,743   | £7,893   |
| 75%                 | £19,128  | £18,066  | £17,004  | £15,941  | £14,879  | £13,816  | £12,754  | £11,692  | £10,629  | £9,567   |
| 80%                 | £22,713  | £21,439  | £20,165  | £18,891  | £17,617  | £16,343  | £15,069  | £13,795  | £12,521  | £11,247  |
| 85%                 | £26,298  | £24,849  | £23,400  | £21,951  | £20,502  | £19,053  | £17,604  | £16,155  | £14,706  | £13,257  |
| 90%                 | £30,734  | £29,459  | £28,184  | £26,909  | £25,634  | £24,359  | £23,084  | £21,809  | £20,534  | £19,259  |
| 95%                 | £34,744  | £33,469  | £32,194  | £30,919  | £29,644  | £28,369  | £27,094  | £25,819  | £24,544  | £23,269  |
| 100%                | £38,754  | £37,479  | £36,204  | £34,929  | £33,654  | £32,379  | £31,104  | £29,829  | £28,554  | £27,279  |

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