

**UNIVERSITY OF BIRMINGHAM AND UNIVERSITY OF YORK
HEALTH ECONOMICS CONSORTIUM
(NICE EXTERNAL CONTRACTOR)**

Health economic report on piloted indicator

QOF indicator area: Hypertension Under 80 Potential output: Recommendations for NICE Menu
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Introduction

This briefing paper provides a summary of the economic evidence generated on the proposed pilot five hypertension indicator for patients under the age of 80. The format of this paper is intended to provide the QOF Advisory Committee with sufficient information upon which to make a recommendation on whether the indicator is economically justifiable.

Piloted indicator

The percentage of patients under 80 years old with hypertension in whom the last recorded blood pressure (measured in the preceding 9 months) is 140/90 or less.

Economic rationale for the indicator

Patients with blood pressure persistently over 140/90 are defined as being hypertensive. Blood pressure greater than 115/70 is associated with increased risk of cardiovascular events as well as other poor health outcomes such as kidney disease and cognitive decline [1].

Pharmaceutical treatment to lower blood pressure in hypertensive patients has been found to be highly cost effective given the low cost of anti-hypertensive drugs and high cost of health outcomes that they can avert. Any of the main classes of drugs to treat hypertension were found to be both cost saving and generate more QALYs than no intervention [1].

NICE guidelines are explicit that there is no robust evidence that monitoring blood pressure to reduce it to a target – such as 140/90 - in hypertensive patients is cost effective [2]. However, this is largely due to a lack of evidence rather than evidence that this does not work. For the purposes of our model we have assumed that the indicator is designed to lower blood pressure and by definition hypertensive patients with BP less than 140/90 must have had high blood pressure successfully lowered. The evidence underpinning the NICE guidelines as stated above is that lowering blood pressure in hypertensive patients is highly cost effective with an implicit conclusion that this is the case even if the patient remains clinically hypertensive.

Objective

To evaluate whether the proposed indicator represents a cost effective use of NHS resources.

Type of health economic analysis

An indicative net benefit approach has been applied with a lifetime horizon at baseline.

Delivery cost of indicator

The NICE guidelines recommend both lifestyle modification and pharmaceutical interventions to lower blood pressure in hypertensive patients [2]. While the guidelines point out evidence for effectiveness of lifestyle modification, such as

increasing exercise, the costs of such advice and support are minimal, although help to stop smoking could involve smoking cessation aides that could have a cost. At the base case we have assumed that advice can be given as part of a GP consultation that lasts 17.2 minutes at a cost of £53, extracted from the Unit Costs of Health and Social Care 2010 [3]. The total costs are increased by £500 per patient to reflect the costs of other interventions such as smoking cessation drug therapy, which has been costed at £1,000 per successful quitter [3]. The £500 cost in our model uses the assumption that 50% of people with hypertension smoke and that all of them will use pharmaceutical support to quit. This is likely to be a significant overestimate of the actual costs of delivering lifestyle interventions but will generate cautious estimates from the model.

Modelling underpinning the NICE guidance reported that for men aged 65 with a greater than 20% chance of CVD over 10 years, all pharmaceutical treatments saved healthcare resource and increased the number of QALYs. This finding was found to be reasonably robust as the risk of CVD and age changed, for both men and women. Given the heterogeneity of the hypertensive population to produce a cautious estimate we have assumed that there is no cost saving from pharmaceutical treatment. However, we have also assumed there is no cost to anti-hypertensive medication which can be justified given the low cost of all classes of hypertensive medications (a maximum of £25 per year per patient for generic drugs) [2].

The incremental cost of providing lifestyle modification advice and support and pharmaceutical treatment at baseline is £553 per patient.

Effectiveness of indicator

There is evidence that lifestyle modification including reduction in alcohol consumption, salt intake and smoking and increases in exercise all reduce blood pressure in patients with hypertension [2]. This reduction in blood pressure would reduce the risk of CVD events and therefore would also increase QALYs. However, no evidence was found by NICE, linking lifestyle modification to QALY gains, as part of their evidence gathering for the hypertension guidelines. For the purposes of our modelling we have assumed that no QALY gains are generated from lifestyle modification. This is a cautious assumption, especially as we have assumed costs to provide advice and support for lifestyle modification.

QALY gains from the use of anti-hypertensive medications are drawn from the NICE model [1]. QALY gains vary between drugs in the model. As a cautious estimate we have assumed that the lowest lifetime QALY gain is used (0.32 for beta-blockers). However, this is based on lifetime compliance with treatment. The NICE guidelines noted that compliance can be as low as 20% and as such we have assumed that only 20% of the potential QALY gain is achieved. This is a particularly cautious assumption as the indicator itself is designed to ensure that patients' blood pressure is lowered, which would encourage GPs to ensure compliance, and the assumed QALY gain is based on any reduction in blood pressure from treatment rather than a specific reduction below a level of 140/90.

The incremental lifetime baseline QALY gain for treatment of hypertensive patients to a BP of 140/90 with drug therapy is 0.064. Applying a weighted average to the eligible population (see below) gives a QALY gain value of 0.041 per patient.

Incremental cost-effectiveness ratio

The NICE model of pharmaceutical intervention found that treatment dominated no intervention at baseline for men and women over 65 with annual risk of CVD of 2%.

Figure 1: Incremental cost-effectiveness ratio

$$ICER = \frac{Cost_{Treatment} - Cost_{Alternative}}{Effect_{Treatment} - Effect_{Alternative}}$$

Eligible population

The eligible population are all patients under the age of 80 with diagnosed hypertension as defined as BP>140/90. Data from the Health Survey for England¹ provides information on the prevalence by age (16+) of hypertension that is successfully treated, untreated and uncontrolled despite treatment. These rates were applied to population statistics from the ONS² to provide an estimate of hypertension in an average practice. This is shown in Table 1 below.

Table 1 Age related hypertension national and practice prevalence rates

Age group	Percentage with hypertension (treated, untreated or uncontrolled)	Percentage of UK population	Percentage of practice population with hypertension
16-24	3.9%	11.8%	0.5%
25-34	4.9%	13.5%	0.7%
35-44	17.1%	13.4%	2.3%
45-54	31.2%	14.0%	4.4%
55-64	48.4%	11.5%	5.6%
65-74	64.2%	9.1%	5.8%
75-79	79.4%*	3.2%	2.5%
TOTAL	-	-	21.7%

*Prevalence for people 75+

The NICE guidance on hypertension is explicit that only people with hypertension and higher degrees of cardiovascular risk (>20% 10 year risk) should be offered pharmaceutical treatment, especially people younger than 40. For patients aged 65 and over the risk score due to their age implies that almost everyone with hypertension will have sufficient risk to be on hypertensive medication. For those between 40 and 65 the proportion that will be suitable for medication will increase with age. For simplicity we have assumed that all patients over 55 are eligible for medication and that no one under 55 is eligible with QALY gains adjusted for this. This means that a weighted average QALY gain of 0.041 per hypertensive patient with BP reduced to target was used in the analysis. This was calculated by dividing the percentage of the practice population over the age of 55 with hypertension by the

¹ See <http://www.ic.nhs.uk/statistics-and-data-collections/health-and-lifestyles-related-surveys/health-survey-for-england/health-survey-for-england--2010-trend-tables>

² See <http://www.neighbourhood.statistics.gov.uk/HTMLDocs/dvc1/UKPyramid.html>

total practice population with hypertension. This also is in line with the available evidence (and NICE modelling) on anti-hypertensive medication where evidence on younger people is not as robust as for older people. The eligible population for antihypertensive medication was explored in sensitivity analysis by looking at values 25% higher and lower than the baseline assumption.

Baseline level of achievement

The indicator was achieved for 52.39% of eligible patients at the beginning of the pilot, rising to 60.90% at its conclusion. The distribution of practice achievement at the final data upload was 50 – 80%.

Population

In the base case, the threshold analysis of the proposed indicator was conducted based on the total practice population registered with practices in England, that is, 8,228 practices with a mean practice size of 6,297 [5].

Table 2: Practice information for all UK members

Country	Number of practices	Number of patients
England	8,228	6,297
Scotland	1,014	5,122
Wales	488	6,146
Northern Ireland	357	5,011

QOF Payments

Each QOF point is assumed to result in a payment of £133.76. This is the value per point in England during 2012/13 (source; Information Centre).

Table 3: Value per point for all UK members (most recently available)

Country	Value per point
England	£133.76
Scotland	£130.46
Wales	£133.72
Northern Ireland	£125.04

Societal value of a QALY

The expected increase in quality adjusted life year (QALY) was costed at both £20,000 and £25,000 per QALY. This is based on the bottom and the middle of the range £20,000 - £30,000, below which NICE generally considers something to be cost effective.

QOF Points

The economic analysis considers the cost-effectiveness of incentivising the proposed activity over a range of QOF points. The range of QOF points evaluated were agreed by NICE, YHEC and the economic sub-group to justify the practice successfully completing the activity.

In the base case analysis, 50 points were allocated to the proposed indicator. This reflects the 55 points allocated to the previous similar hypertension indicator less the fact that those over 80 have now got a separate indicator. Sensitivity analysis will be followed out between the agreed lower and upper bounds of 30 and 80 points (i.e. the range evaluated).

Thresholds

Based upon work with pilot GP practices around baseline levels of achievement payment thresholds of 45-80% were suggested by the pilot team.

Results (assuming a value per QALY of £25,000)

The indicative net benefit analysis suggests that the indicator is highly cost effective, with QOF payments up to the upper bound of 80 points warranted on economic grounds (Appendix A). Under our conservative assumptions, the increase in quality of life offered by advice and treatment outweighs the additional healthcare costs in a net benefit analysis, if the value per QALY is assumed to be £25,000. This finding holds provided that achievement rises from the pilot baseline figure of 52.4% to 52.6% at 50 points.

Sensitivity analysis shows the findings are highly insensitive to a 50% increase in costs (Appendix B) or to a 25% reduction in the population eligible for anti-hypertensive medication (Appendix C). The indicator could no longer be recommended at 50 points with 80% achievement if:

- the cost of the intervention were to rise to £1,007 for each patient with hypertension or;
- the population eligible for hypertensive medication fell to 36% of all patients under 80 with hypertension.

The findings are largely insensitive to reductions in the QALYs generated by drugs to reduce hypertension. QALYs generated for patients over 55 treated with anti-hypertensive drugs would have to fall almost 43% from our already cautious baseline before the indicator is not cost effective at a baseline of 50 points.

If the assumptions underpinning this analysis hold, then due to the potential size of the eligible population and the relatively low cost of the intervention compared to potential quality of life gains, there is a strong economic case for the indicator at a baseline of 50 points. The assumptions around potential QALY benefit and costs can be seen as conservative.

There are economic grounds to award up to the maximum QOF points appropriate for this indicator, i.e. 80 points.

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

The indicative net benefit analysis suggests that the indicator is highly cost effective, with QOF payments up to the upper bound of 80 points warranted on economic grounds (Appendix D). Under our conservative assumptions, the increase in quality of life offered by advice and treatment outweighs the additional healthcare costs in a net benefit analysis if the value per QALY is assumed to be £20,000. The indicator ceases to be justifiable on economic grounds at 50 points when the value per QALY falls to £13,922.

Sensitivity analysis shows the findings are sensitive to a 50% increase in costs (Appendix E). At a baseline of 50 points and 80% achievement for the indicator, costs per patient would have to rise 45% to £802, for it not to be recommended on economic grounds.

Findings are largely insensitive to a 25% reduction in the population eligible for anti-hypertensive medication (Appendix F). The population eligible for hypertensive medication would have to fall to 44% of all patients under 80 with hypertension before the indicator cannot be recommended on economic grounds at a baseline of 50 points and 80% achievement.

The findings are largely insensitive to reductions in the QALYs generated by drugs to reduce hypertension. QALYs generated for patients over 55 treated with anti-hypertensive drugs would have to fall almost 29% from our already cautious baseline before the indicator is not cost effective at a baseline of 50 points and 80% achievement.

If the assumptions underpinning this analysis hold, then due to the potential size of the eligible population and the relatively low cost of the intervention compared to potential quality of life gains, there is a strong economic case for the indicator at a baseline of 50 points. The assumptions around potential QALY benefit and costs can be seen as conservative.

There are economic grounds to award up to the maximum QOF points appropriate for this indicator, i.e. 80 points.

Discussion

Under the conservative baseline assumptions it appears unambiguous that this indicator is highly cost effective. We have taken a very pessimistic assumption that the costs of lifestyle modification are included but no QALY benefit accrues from this modification. We have also assumed the lowest level of compliance with anti-hypertensive therapy found in the literature and the lowest reported value for QALY gains from the different classes of anti-hypertensive medication. We have assumed that all those over the age of 55 with BP>140/90 are eligible for anti-hypertension medication which may be unrealistic but this is counteracted by assuming no-one under 55 is eligible. This assumption also makes the NICE modelling results generalisable to our model as they assumed a population at baseline that was 65 or over and showed little difference in results if the population was 55.

Finally it must be noted that we have not modelled treating hypertension to a target as no data were available to do this. However, we are confident that the approach we have taken indicates that the indicator is highly cost effective, on the basis that

treatment of high BP is relatively cheap now that generic drugs are available and potential health benefits are so great (ie it is cost-effective to use medication and smoking cessation interventions to achieve better blood pressure outcomes for this population).

References

[1] National Clinical Guideline Centre. The clinical management of primary hypertension in adults. London: Royal College of Physicians, 2011.

[2] National Institute of Health and Clinical Excellence. Hypertension: Clinical management of primary hypertension in adults. 2011

[3] Woolacott NF, Jones L, Forbes CA et al. The clinical effectiveness and cost effectiveness of bupropion and nicotine replacement therapy for smoking cessation: a systematic review and economic evaluation. Health Technol Assess 2002.

[4] Unit Costs of Health & Social Care 2010. Personal Social Services Research Unit (PSSRU). Compiled by Lesley Curtis. University of Kent.

[5] General Practice Trends in the UK. NHS Information Centre. Published 22 March 2011.

Appendix A: Net Benefit Base Case Analysis

Pilot 5 - Hypertension Under 80: Net Benefit Analysis

Value per point achieved	£133.76	Societal value of a QALY	£25,000
Number of practices	8,228		
Mean practice population	6,297		
Minimum threshold	45%	Baseline achievement	
Maximum threshold	80%	Eligible population (mean % of practice population)	21.7%
		Baseline achievement (mean % of eligible patients)	52.4%
		Cost-effectiveness estimates	
		Incremental cost (£ per patient)	£553
		Incremental effect (QALYs per patient)	0.041

Points	30	35	40	45	50	55	60	65	70	75	80		
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	-£1,392,088,786	-103211
35%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£1,081,215,900	-80162
40%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£770,343,013	-57114
45%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£459,470,126	-34066
50%	£4,717	£5,503	£6,289	£7,075	£7,861	£8,647	£9,434	£10,220	£11,006	£11,792	£12,578	-£148,597,240	-11017
55%	£9,434	£11,006	£12,578	£14,150	£15,723	£17,295	£18,867	£20,439	£22,012	£23,584	£25,156	£162,275,647	12031
60%	£14,150	£16,509	£18,867	£21,225	£23,584	£25,942	£28,301	£30,659	£33,017	£35,376	£37,734	£473,148,533	35080
65%	£18,867	£22,012	£25,156	£28,301	£31,445	£34,590	£37,734	£40,879	£44,023	£47,168	£50,312	£784,021,420	58128
70%	£23,584	£27,514	£31,445	£35,376	£39,306	£43,237	£47,168	£51,098	£55,029	£58,959	£62,890	£1,094,894,307	81177
75%	£28,301	£33,017	£37,734	£42,451	£47,168	£51,884	£56,601	£61,318	£66,035	£70,751	£75,468	£1,405,767,193	104225
80%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£1,716,640,080	127273
85%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£2,027,512,966	150322
90%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£2,338,385,853	173370
95%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£2,649,258,739	196419
100%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£2,960,131,626	219467
Net Benefit (£000s)													
30%	-£1,188,184	-£1,188,184	-£1,188,184	-£1,188,184	-£1,188,184	-£1,188,184	-£1,188,184	-£1,188,184	-£1,188,184	-£1,188,184	-£1,188,184	Where the net benefit produces a non-negative outcome then it is <u>cost effective</u> for the NHS to adopt the indicator.	
35%	-£922,846	-£922,846	-£922,846	-£922,846	-£922,846	-£922,846	-£922,846	-£922,846	-£922,846	-£922,846	-£922,846		
40%	-£657,508	-£657,508	-£657,508	-£657,508	-£657,508	-£657,508	-£657,508	-£657,508	-£657,508	-£657,508	-£657,508	When this is the case, the cells are highlighted with a yellow background.	
45%	-£392,170	-£392,170	-£392,170	-£392,170	-£392,170	-£392,170	-£392,170	-£392,170	-£392,170	-£392,170	-£392,170		
50%	-£131,548	-£132,335	-£133,121	-£133,907	-£134,693	-£135,479	-£136,265	-£137,051	-£137,837	-£138,624	-£139,410		
55%	£129,073	£127,501	£125,928	£124,356	£122,784	£121,212	£119,639	£118,067	£116,495	£114,923	£113,350		
60%	£389,694	£387,336	£384,978	£382,619	£380,261	£377,903	£375,544	£373,186	£370,827	£368,469	£366,111		
65%	£650,316	£647,171	£644,027	£640,882	£637,738	£634,593	£631,449	£628,304	£625,160	£622,015	£618,871		
70%	£910,937	£907,007	£903,076	£899,145	£895,215	£891,284	£887,353	£883,423	£879,492	£875,562	£871,631		
75%	£1,171,559	£1,166,842	£1,162,125	£1,157,408	£1,152,692	£1,147,975	£1,143,258	£1,138,541	£1,133,825	£1,129,108	£1,124,391		
80%	£1,432,180	£1,426,677	£1,421,174	£1,415,671	£1,410,168	£1,404,666	£1,399,163	£1,393,660	£1,388,157	£1,382,654	£1,377,151		
85%	£1,697,518	£1,692,015	£1,686,512	£1,681,010	£1,675,507	£1,670,004	£1,664,501	£1,658,998	£1,653,495	£1,647,992	£1,642,489		
90%	£1,962,856	£1,957,353	£1,951,851	£1,946,348	£1,940,845	£1,935,342	£1,929,839	£1,924,336	£1,918,833	£1,913,330	£1,907,827		
95%	£2,228,194	£2,222,692	£2,217,189	£2,211,686	£2,206,183	£2,200,680	£2,195,177	£2,189,674	£2,184,171	£2,178,669	£2,173,166		
100%	£2,493,533	£2,488,030	£2,482,527	£2,477,024	£2,471,521	£2,466,018	£2,460,515	£2,455,012	£2,449,510	£2,444,007	£2,438,504		

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.

Appendix B: Net Benefit Analysis Assuming 50% Increase in Incremental Costs per Patient

Pilot 5 - Hypertension Under 80: Net Benefit Analysis

Value per point achieved	£133.76	Societal value of a QALY	£25,000
Number of practices	8,228		
Mean practice population	6,297		
Minimum threshold	45%	Baseline achievement	
Maximum threshold	80%	Eligible population (mean % of practice population)	21.7%
		Baseline achievement (mean % of eligible patients)	52.4%
		Cost-effectiveness estimates	
		Incremental cost (£ per patient)	£830
		Incremental effect (QALYs per patient)	0.041

Points 30 35 40 45 50 55 60 65 70 75 80

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	-£2,089,391,849	-103211
35%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£1,622,801,441	-80162
40%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£1,156,211,032	-57114
45%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£689,620,624	-34066
50%	£4,717	£5,503	£6,289	£7,075	£7,861	£8,647	£9,434	£10,220	£11,006	£11,792	£12,578	-£223,030,215	-11017
55%	£9,434	£11,006	£12,578	£14,150	£15,723	£17,295	£18,867	£20,439	£22,012	£23,584	£25,156	£243,560,193	12031
60%	£14,150	£16,509	£18,867	£21,225	£23,584	£25,942	£28,301	£30,659	£33,017	£35,376	£37,734	£710,150,602	35080
65%	£18,867	£22,012	£25,156	£28,301	£31,445	£34,590	£37,734	£40,879	£44,023	£47,168	£50,312	£1,176,741,010	58128
70%	£23,584	£27,514	£31,445	£35,376	£39,306	£43,237	£47,168	£51,098	£55,029	£58,959	£62,890	£1,643,331,419	81177
75%	£28,301	£33,017	£37,734	£42,451	£47,168	£51,884	£56,601	£61,318	£66,035	£70,751	£75,468	£2,109,921,827	104225
80%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£2,576,512,235	127273
85%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£3,043,102,644	150322
90%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£3,509,693,052	173370
95%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£3,976,283,461	196419
100%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£4,442,873,869	219467

Net Benefit (£000s)											
30%	-£490,881	-£490,881	-£490,881	-£490,881	-£490,881	-£490,881	-£490,881	-£490,881	-£490,881	-£490,881	-£490,881
35%	-£381,261	-£381,261	-£381,261	-£381,261	-£381,261	-£381,261	-£381,261	-£381,261	-£381,261	-£381,261	-£381,261
40%	-£271,640	-£271,640	-£271,640	-£271,640	-£271,640	-£271,640	-£271,640	-£271,640	-£271,640	-£271,640	-£271,640
45%	-£162,019	-£162,019	-£162,019	-£162,019	-£162,019	-£162,019	-£162,019	-£162,019	-£162,019	-£162,019	-£162,019
50%	-£57,115	-£57,902	-£58,688	-£59,474	-£60,260	-£61,046	-£61,832	-£62,618	-£63,404	-£64,191	-£64,977
55%	£47,788	£46,216	£44,644	£43,072	£41,499	£39,927	£38,355	£36,783	£35,210	£33,638	£32,066
60%	£152,692	£150,334	£147,976	£145,617	£143,259	£140,900	£138,542	£136,184	£133,825	£131,467	£129,109
65%	£257,596	£254,452	£251,307	£248,163	£245,018	£241,874	£238,729	£235,585	£232,440	£229,296	£226,151
70%	£362,500	£358,569	£354,639	£350,708	£346,778	£342,847	£338,916	£334,986	£331,055	£327,124	£323,194
75%	£467,404	£462,687	£457,970	£453,254	£448,537	£443,820	£439,103	£434,387	£429,670	£424,953	£420,236
80%	£572,308	£566,805	£561,302	£555,799	£550,296	£544,793	£539,291	£533,788	£528,285	£522,782	£517,279
85%	£681,928	£676,426	£670,923	£665,420	£659,917	£654,414	£648,911	£643,408	£637,905	£632,403	£626,900
90%	£791,549	£786,046	£780,543	£775,040	£769,538	£764,035	£758,532	£753,029	£747,526	£742,023	£736,520
95%	£901,170	£895,667	£890,164	£884,661	£879,158	£873,655	£868,152	£862,650	£857,147	£851,644	£846,141
100%	£1,010,790	£1,005,288	£999,785	£994,282	£988,779	£983,276	£977,773	£972,270	£966,767	£961,264	£955,762

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.

Appendix C: Net Benefit Analysis Assuming 25% Reduction in Population Eligible for Anti-hypertensive Medication

Pilot 5 - Hypertension Under 80: Net Benefit Analysis

Value per point achieved	£133.76	Societal value of a QALY	£25,000
Number of practices	8,228		
Mean practice population	6,297		
Minimum threshold	45%	Baseline achievement	
Maximum threshold	80%	Eligible population (mean % of practice population)	21.7%
		Baseline achievement (mean % of eligible patients)	52.4%
		Cost-effectiveness estimates	
		Incremental cost (£ per patient)	£553
		Incremental effect (QALYs per patient)	0.031

Points	30	35	40	45	50	55	60	65	70	75	80
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National totals												
Expected Achieveme	QOF payments (£000s)											Change in treatment cost (£)
												Change in QALYs
30%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£1,392,088,786
35%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£1,081,215,900
40%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£770,343,013
45%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£459,470,126
50%	£4,717	£5,503	£6,289	£7,075	£7,861	£8,647	£9,434	£10,220	£11,006	£11,792	£12,578	-£148,597,240
55%	£9,434	£11,006	£12,578	£14,150	£15,723	£17,295	£18,867	£20,439	£22,012	£23,584	£25,156	£162,275,647
60%	£14,150	£16,509	£18,867	£21,225	£23,584	£25,942	£28,301	£30,659	£33,017	£35,376	£37,734	£473,148,533
65%	£18,867	£22,012	£25,156	£28,301	£31,445	£34,590	£37,734	£40,879	£44,023	£47,168	£50,312	£784,021,420
70%	£23,584	£27,514	£31,445	£35,376	£39,306	£43,237	£47,168	£51,098	£55,029	£58,959	£62,890	£1,094,894,307
75%	£28,301	£33,017	£37,734	£42,451	£47,168	£51,884	£56,601	£61,318	£66,035	£70,751	£75,468	£1,405,767,193
80%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£1,716,640,080
85%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£2,027,512,966
90%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£2,338,385,853
95%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£2,649,258,739
100%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£2,960,131,626

Net Benefit (£000s)											
30%	-£558,849	-£558,849	-£558,849	-£558,849	-£558,849	-£558,849	-£558,849	-£558,849	-£558,849	-£558,849	-£558,849
35%	-£434,051	-£434,051	-£434,051	-£434,051	-£434,051	-£434,051	-£434,051	-£434,051	-£434,051	-£434,051	-£434,051
40%	-£309,252	-£309,252	-£309,252	-£309,252	-£309,252	-£309,252	-£309,252	-£309,252	-£309,252	-£309,252	-£309,252
45%	-£184,453	-£184,453	-£184,453	-£184,453	-£184,453	-£184,453	-£184,453	-£184,453	-£184,453	-£184,453	-£184,453
50%	-£64,371	-£65,157	-£65,943	-£66,729	-£67,515	-£68,301	-£69,087	-£69,874	-£70,660	-£71,446	-£72,232
55%	£55,711	£54,139	£52,567	£50,995	£49,422	£47,850	£46,278	£44,706	£43,133	£41,561	£39,989
60%	£175,794	£173,435	£171,077	£168,718	£166,360	£164,002	£161,643	£159,285	£156,927	£154,568	£152,210
65%	£295,876	£292,731	£289,587	£286,442	£283,298	£280,153	£277,009	£273,864	£270,720	£267,575	£264,431
70%	£415,958	£412,027	£408,097	£404,166	£400,235	£396,305	£392,374	£388,443	£384,513	£380,582	£376,652
75%	£536,040	£531,323	£526,606	£521,890	£517,173	£512,456	£507,739	£503,023	£498,306	£493,589	£488,872
80%	£656,122	£650,619	£645,116	£639,613	£634,111	£628,608	£623,105	£617,602	£612,099	£606,596	£601,093
85%	£780,921	£775,418	£769,915	£764,412	£758,909	£753,407	£747,904	£742,401	£736,898	£731,395	£725,892
90%	£905,720	£900,217	£894,714	£889,211	£883,708	£878,205	£872,703	£867,200	£861,697	£856,194	£850,691
95%	£1,030,519	£1,025,016	£1,019,513	£1,014,010	£1,008,507	£1,003,004	£997,501	£991,999	£986,496	£980,993	£975,490
100%	£1,155,318	£1,149,815	£1,144,312	£1,138,809	£1,133,306	£1,127,803	£1,122,300	£1,116,797	£1,111,295	£1,105,792	£1,100,289

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.

Appendix D: Net Benefit Base Case Analysis

Pilot 5 - Hypertension Under 80: Net Benefit Analysis

Value per point achieved £133.76
Number of practices 8,228
Mean practice population 6,297

Societal value of a QALY £20,000

Minimum threshold 45%
Maximum threshold 80%

Baseline achievement
Eligible population (mean % of practice population) 21.7%
Baseline achievement (mean % of eligible patients) 52.4%

Cost-effectiveness estimates
Incremental cost (£ per patient) £553
Incremental effect (QALYs per patient) 0.041

Points 30 35 40 45 50 55 60 65 70 75 80

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	-£1,392,088,786	-103211
35%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£1,081,215,900	-80162
40%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£770,343,013	-57114
45%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£459,470,126	-34066
50%	£4,717	£5,503	£6,289	£7,075	£7,861	£8,647	£9,434	£10,220	£11,006	£11,792	£12,578	-£148,597,240	-11017
55%	£9,434	£11,006	£12,578	£14,150	£15,723	£17,295	£18,867	£20,439	£22,012	£23,584	£25,156	£162,275,647	12031
60%	£14,150	£16,509	£18,867	£21,225	£23,584	£25,942	£28,301	£30,659	£33,017	£35,376	£37,734	£473,148,533	35080
65%	£18,867	£22,012	£25,156	£28,301	£31,445	£34,590	£37,734	£40,879	£44,023	£47,168	£50,312	£784,021,420	58128
70%	£23,584	£27,514	£31,445	£35,376	£39,306	£43,237	£47,168	£51,098	£55,029	£58,959	£62,890	£1,094,894,307	81177
75%	£28,301	£33,017	£37,734	£42,451	£47,168	£51,884	£56,601	£61,318	£66,035	£70,751	£75,468	£1,405,767,193	104225
80%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£1,716,640,080	127273
85%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£2,027,512,966	150322
90%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£2,338,385,853	173370
95%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£2,649,258,739	196419
100%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£2,960,131,626	219467

Net Benefit (£000s)											
30%	-£672,130	-£672,130	-£672,130	-£672,130	-£672,130	-£672,130	-£672,130	-£672,130	-£672,130	-£672,130	-£672,130
35%	-£522,034	-£522,034	-£522,034	-£522,034	-£522,034	-£522,034	-£522,034	-£522,034	-£522,034	-£522,034	-£522,034
40%	-£371,938	-£371,938	-£371,938	-£371,938	-£371,938	-£371,938	-£371,938	-£371,938	-£371,938	-£371,938	-£371,938
45%	-£221,842	-£221,842	-£221,842	-£221,842	-£221,842	-£221,842	-£221,842	-£221,842	-£221,842	-£221,842	-£221,842
50%	-£76,463	-£77,249	-£78,035	-£78,821	-£79,607	-£80,393	-£81,179	-£81,966	-£82,752	-£83,538	-£84,324
55%	£68,917	£67,344	£65,772	£64,200	£62,628	£61,055	£59,483	£57,911	£56,339	£54,766	£53,194
60%	£214,296	£211,937	£209,579	£207,221	£204,862	£202,504	£200,145	£197,787	£195,429	£193,070	£190,712
65%	£359,675	£356,530	£353,386	£350,241	£347,097	£343,952	£340,808	£337,663	£334,519	£331,374	£328,230
70%	£505,054	£501,124	£497,193	£493,262	£489,332	£485,401	£481,470	£477,540	£473,609	£469,678	£465,748
75%	£650,433	£645,717	£641,000	£636,283	£631,566	£626,850	£622,133	£617,416	£612,699	£607,982	£603,266
80%	£795,813	£790,310	£784,807	£779,304	£773,801	£768,298	£762,795	£757,292	£751,789	£746,287	£740,784
85%	£945,908	£940,406	£934,903	£929,400	£923,897	£918,394	£912,891	£907,388	£901,885	£896,382	£890,880
90%	£1,096,004	£1,090,502	£1,084,999	£1,079,496	£1,073,993	£1,068,490	£1,062,987	£1,057,484	£1,051,981	£1,046,478	£1,040,976
95%	£1,246,100	£1,240,597	£1,235,095	£1,229,592	£1,224,089	£1,218,586	£1,213,083	£1,207,580	£1,202,077	£1,196,574	£1,191,072
100%	£1,396,196	£1,390,693	£1,385,191	£1,379,688	£1,374,185	£1,368,682	£1,363,179	£1,357,676	£1,352,173	£1,346,670	£1,341,167

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.

Appendix E: Net Benefit Analysis Assuming 50% Increase in Incremental Costs per Patient

Pilot 5 - Hypertension Under 80: Net Benefit Analysis

Value per point achieved	£133.76	Societal value of a QALY	£20,000
Number of practices	8,228		
Mean practice population	6,297		
Minimum threshold	45%	Baseline achievement	
Maximum threshold	80%	Eligible population (mean % of practice population)	21.7%
		Baseline achievement (mean % of eligible patients)	52.4%
		Cost-effectiveness estimates	
		Incremental cost (£ per patient)	£830
		Incremental effect (QALYs per patient)	0.041

Points	30	35	40	45	50	55	60	65	70	75	80
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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	-£2,089,391,849	-103211
35%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£1,622,801,441	-80162
40%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£1,156,211,032	-57114
45%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£689,620,624	-34066
50%	£4,717	£5,503	£6,289	£7,075	£7,861	£8,647	£9,434	£10,220	£11,006	£11,792	£12,578	-£223,030,215	-11017
55%	£9,434	£11,006	£12,578	£14,150	£15,723	£17,295	£18,867	£20,439	£22,012	£23,584	£25,156	£243,560,193	12031
60%	£14,150	£16,509	£18,867	£21,225	£23,584	£25,942	£28,301	£30,659	£33,017	£35,376	£37,734	£710,150,602	35080
65%	£18,867	£22,012	£25,156	£28,301	£31,445	£34,590	£37,734	£40,879	£44,023	£47,168	£50,312	£1,176,741,010	58128
70%	£23,584	£27,514	£31,445	£35,376	£39,306	£43,237	£47,168	£51,098	£55,029	£58,959	£62,890	£1,643,331,419	81177
75%	£28,301	£33,017	£37,734	£42,451	£47,168	£51,884	£56,601	£61,318	£66,035	£70,751	£75,468	£2,109,921,827	104225
80%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£2,576,512,235	127273
85%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£3,043,102,644	150322
90%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£3,509,693,052	173370
95%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£3,976,283,461	196419
100%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£4,442,873,869	219467

Net Benefit (£000s)											
30%	£25,173	£25,173	£25,173	£25,173	£25,173	£25,173	£25,173	£25,173	£25,173	£25,173	£25,173
35%	£19,552	£19,552	£19,552	£19,552	£19,552	£19,552	£19,552	£19,552	£19,552	£19,552	£19,552
40%	£13,930	£13,930	£13,930	£13,930	£13,930	£13,930	£13,930	£13,930	£13,930	£13,930	£13,930
45%	£8,309	£8,309	£8,309	£8,309	£8,309	£8,309	£8,309	£8,309	£8,309	£8,309	£8,309
50%	-£2,030	-£2,816	-£3,602	-£4,388	-£5,174	-£5,960	-£6,746	-£7,533	-£8,319	-£9,105	-£9,891
55%	-£12,368	-£13,940	-£15,512	-£17,085	-£18,657	-£20,229	-£21,801	-£23,374	-£24,946	-£26,518	-£28,091
60%	-£22,706	-£25,065	-£27,423	-£29,781	-£32,140	-£34,498	-£36,857	-£39,215	-£41,573	-£43,932	-£46,290
65%	-£33,045	-£36,189	-£39,334	-£42,478	-£45,623	-£48,767	-£51,912	-£55,056	-£58,201	-£61,345	-£64,490
70%	-£43,383	-£47,314	-£51,244	-£55,175	-£59,106	-£63,036	-£66,967	-£70,897	-£74,828	-£78,759	-£82,689
75%	-£53,721	-£58,438	-£63,155	-£67,872	-£72,588	-£77,305	-£82,022	-£86,739	-£91,455	-£96,172	-£100,889
80%	-£64,060	-£69,563	-£75,065	-£80,568	-£86,071	-£91,574	-£97,077	-£102,580	-£108,083	-£113,586	-£119,088
85%	-£69,681	-£75,184	-£80,687	-£86,190	-£91,693	-£97,196	-£102,699	-£108,201	-£113,704	-£119,207	-£124,710
90%	-£75,303	-£80,806	-£86,309	-£91,811	-£97,314	-£102,817	-£108,320	-£113,823	-£119,326	-£124,829	-£130,332
95%	-£80,924	-£86,427	-£91,930	-£97,433	-£102,936	-£108,439	-£113,942	-£119,445	-£124,947	-£130,450	-£135,953
100%	-£86,546	-£92,049	-£97,552	-£103,055	-£108,557	-£114,060	-£119,563	-£125,066	-£130,569	-£136,072	-£141,575

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.

Appendix F: Net Benefit Analysis With 25% Reduction in Pop. Eligible for Anti-hypertensive Medication

Pilot 5 - Hypertension Under 80: Net Benefit Analysis

Value per point achieved £133.76
Number of practices 8,228
Mean practice population 6,297

Societal value of a QALY

£20,000

Minimum threshold 45%
Maximum threshold 80%

Baseline achievement

Eligible population (mean % of practice population) 21.7%
Baseline achievement (mean % of eligible patients) 52.4%

Cost-effectiveness estimates

Incremental cost (£ per patient) £553
Incremental effect (QALYs per patient) 0.031

Points 30 35 40 45 50 55 60 65 70 75 80

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	-£1,392,088,786
35%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£1,081,215,900
40%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£770,343,013
45%	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	-£459,470,126
50%	£4,717	£5,503	£6,289	£7,075	£7,861	£8,647	£9,434	£10,220	£11,006	£11,792	£12,578	-£148,597,240
55%	£9,434	£11,006	£12,578	£14,150	£15,723	£17,295	£18,867	£20,439	£22,012	£23,584	£25,156	£162,275,647
60%	£14,150	£16,509	£18,867	£21,225	£23,584	£25,942	£28,301	£30,659	£33,017	£35,376	£37,734	£473,148,533
65%	£18,867	£22,012	£25,156	£28,301	£31,445	£34,590	£37,734	£40,879	£44,023	£47,168	£50,312	£784,021,420
70%	£23,584	£27,514	£31,445	£35,376	£39,306	£43,237	£47,168	£51,098	£55,029	£58,959	£62,890	£1,094,894,307
75%	£28,301	£33,017	£37,734	£42,451	£47,168	£51,884	£56,601	£61,318	£66,035	£70,751	£75,468	£1,405,767,193
80%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£1,716,640,080
85%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£2,027,512,966
90%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£2,338,385,853
95%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£2,649,258,739
100%	£33,017	£38,520	£44,023	£49,526	£55,029	£60,532	£66,035	£71,538	£77,040	£82,543	£88,046	£2,960,131,626
Net Benefit (£000s)												
30%	-£168,662	-£168,662	-£168,662	-£168,662	-£168,662	-£168,662	-£168,662	-£168,662	-£168,662	-£168,662	-£168,662	-£168,662
35%	-£130,997	-£130,997	-£130,997	-£130,997	-£130,997	-£130,997	-£130,997	-£130,997	-£130,997	-£130,997	-£130,997	-£130,997
40%	-£93,333	-£93,333	-£93,333	-£93,333	-£93,333	-£93,333	-£93,333	-£93,333	-£93,333	-£93,333	-£93,333	-£93,333
45%	-£55,668	-£55,668	-£55,668	-£55,668	-£55,668	-£55,668	-£55,668	-£55,668	-£55,668	-£55,668	-£55,668	-£55,668
50%	-£22,720	-£23,507	-£24,293	-£25,079	-£25,865	-£26,651	-£27,437	-£28,223	-£29,009	-£29,796	-£30,582	-£30,582
55%	£10,227	£8,655	£7,083	£5,511	£3,938	£2,366	£794	-£778	-£2,351	-£3,923	-£5,495	-£5,495
60%	£43,175	£40,817	£38,458	£36,100	£33,742	£31,383	£29,025	£26,666	£24,308	£21,950	£19,591	£19,591
65%	£76,123	£72,978	£69,834	£66,689	£63,545	£60,400	£57,256	£54,111	£50,967	£47,822	£44,678	£44,678
70%	£109,071	£105,140	£101,209	£97,279	£93,348	£89,417	£85,487	£81,556	£77,626	£73,695	£69,764	£69,764
75%	£142,018	£137,302	£132,585	£127,868	£123,151	£118,435	£113,718	£109,001	£104,284	£99,568	£94,851	£94,851
80%	£174,966	£169,463	£163,960	£158,458	£152,955	£147,452	£141,949	£136,446	£130,943	£125,440	£119,937	£119,937
85%	£212,631	£207,128	£201,625	£196,122	£190,619	£185,116	£179,613	£174,111	£168,608	£163,105	£157,602	£157,602
90%	£250,295	£244,792	£239,289	£233,787	£228,284	£222,781	£217,278	£211,775	£206,272	£200,769	£195,266	£195,266
95%	£287,960	£282,457	£276,954	£271,451	£265,948	£260,445	£254,942	£249,440	£243,937	£238,434	£232,931	£232,931
100%	£325,624	£320,121	£314,619	£309,116	£303,613	£298,110	£292,607	£287,104	£281,601	£276,098	£270,595	£270,595

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.