

Summary: Analysis & Evidence

Policy Option 1

Description:

FULL ECONOMIC ASSESSMENT

Price Base Year 2014	PV Base Year 2014	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: -£0.04m	High: £0.296m	Best Estimate: £0.118m

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	Optional	£20k	£176k
High	Optional	£31k	£268k
Best Estimate	Optional	£26k	£222k

Description and scale of key monetised costs by 'main affected groups'

Total gross cost to keepers, per business, is estimated at £8,600 (loss of camelid value plus keeper time for testing). This suggests that under the Preferred option, three non-complying businesses in a year could face gross costs of around £26k per annum. (See appendix for full costs)

Other key non-monetised costs by 'main affected groups'

This includes the costs to Government of additional testing, post-mortems and haulage of infected animals. For keepers there is also the reduced potential enjoyment of keeping the animal for a longer period.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	Optional	£27k	£228k
High	Optional	£55k	£472k
Best Estimate	Optional	£39k	£340k

Description and scale of key monetised benefits by 'main affected groups'

The private quantified benefits to the keeper are the transfer payments of compensation for animals culled, and the impact of reducing further losses by culling animals earlier, estimated at approx £13,000 per business, **£39k** for three non-complying businesses.

Other key non-monetised benefits by 'main affected groups'

Camelid keepers would be at less risk of additional and expensive TB herd cases, they would face reduced stress of operating businesses under restrictions as well as the emotional impact of losing valued camelids. Haulage and disposal fees would also be paid for by Government. Benefits enjoyed by Government include reduced risk of additional and expensive TB cases. There may be a welfare gain of quickly culling infected animals.

Key assumptions/sensitivities/risks	Discount rate (%)	3.5
<p>Future levels of bTB in camelids are uncertain, as is the future number of refusals to test. Number of camelids slaughtered due to additional testing along with their potential value is also uncertain given the wide range of infection prevalence within affected herds. Uncertainty around the TB testing refusal rate when mandatory blood testing is rolled out. Potential to increase as some in industry are known to be sceptical of blood testing. (See table 10 and section 9)</p>		

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:	In scope of OITO?	Measure qualifies as
Costs: 0.020	Yes	Zero net cost
Benefits: 0.031		
Net: 0.011		

Evidence Base (for summary sheets)

1. Introduction

Bovine TB (bTB) is a serious infectious disease of cattle, and is one of the biggest challenges facing the cattle farming industry today. TB related controls in England cost government almost £100 million per year. In 2013, almost 6.3 million cattle were tested for TB resulting in 3,900 new herd TB incidents, 5,200 herds under restriction and the slaughter of 26,600 animals¹.

The Coalition Government is committed to putting in place a comprehensive package of measures to tackle bTB, as set out in the TB Strategy² published in April 2014. There is no single solution, so we need to use every control tool in the toolbox to reduce the disease in cattle and other species, in a proportionate and cost-effective way. We envisage that a balanced programme should include the following key elements, many of which are already in place:

- surveillance for the disease in cattle and control measures in those herds where infection is identified;
- controlling the disease in badgers;
- enhanced biosecurity and husbandry practices by cattle owners;
- advice and support to farmers;
- **dealing with bTB in non-bovine kept species (including camelids [llamas, alpaca] and goats)**; and
- focused research and development (including development of a cattle vaccine and an oral badger vaccine).

2. Rationale for intervention

Bovine TB (bTB, caused by *Mycobacterium bovis*) is a serious infectious, often fatal, bacterial disease of cattle and other mammals, including South American camelids: alpacas and llamas. In England around 9 camelid herds per year are identified by AHVLA with confirmed new TB infections caused by *M. bovis*³. The government intervenes generally because actions taken by one animal keeper in relation to bTB on his or her premises may allow onward spread that causes losses and costs to others (including keepers of other susceptible species). Such interventions are in proportion to the risks involved.

Current government intervention with herds of camelids that have TB is partly based on voluntary agreement with keepers. The law does not specify the flat £750 taxpayer-funded non-statutory payment that is currently offered for each animal identified as affected and culled⁴. Section 32(3) of the Animal Health Act 1981 requires compensation to be set down in an Order and the lack of a statutory compensation scheme leaves the government unable to invoke other statutory control measures (powers of entry; testing and removal of animals) in a limited number of cases. Defra lawyers have advised that a statutory compensation scheme must be placed in law.

3. Policy objective and intended effect

The primary aim is to improve disease management by ensuring all camelid keepers with animals affected (those infected or affected by control measures) by TB undergo a new enhanced testing regime (comprising compulsory skin and double blood testing); and for those who currently refuse to have their herd tested to comply (each year around 5 camelid keepers with suspicion of disease in their herds refuse blood testing). Up until now, TB blood testing of affected camelid herds was voluntary. Camelid keepers could get their animals de-restricted on the back of negative skin test results alone, thus increasing the risk of leaving infected animals undetected in the herd compared with the far more sensitive combined skin and blood TB testing regime.

¹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/318717/bovinetb-dataset-11jun14.xls

² <https://www.gov.uk/government/publications/a-strategy-for-achieving-officially-bovine-tuberculosis-free-status-for-england>

³ <https://www.gov.uk/government/statistical-data-sets/other-tb-statistics>

⁴ £750 agreed with HMT in 2008, based on limited market information available at the time

4. Application and scope

TB control is a devolved matter. These changes will apply to England only.

5. Preferred Option

TB in Camelids

Data on camelid premises is very limited. Veterinary and epidemiology knowledge of TB in these species is also fairly limited, so the following estimates are approximate to indicate the potential scale of impacts.

According to the British Llama Association (BLA) and British Alpaca Society (BAS) it is estimated that there are between 28,000 – 34,000 camelids in England, around 10,000 of which are owned by 250-300 businesses. The remainder are kept as pets or as ornamental animals. Camelids currently undergo skin and blood testing under a non-statutory scheme. From 2008 to 2013 on average 9 premises experienced confirmed herd cases of TB per year, with around 8 animals culled per case on average.

AHVLA suggests around 5 refusals of blood testing occur every year. Without the presence of any better information we assume 3 of these 5 refusals are businesses. For these businesses this will mean the use of double blood testing on top of skin testing, as is the case for the vast majority of camelid premises. Given limited information we assume the same number of refusals and test-positive animals per case going forward.

If disease is found on a farm via testing, then any test-positive animals are removed with the holding put on movement restrictions. These are lifted after two clear consecutive TB tests are carried out.

Option 1 - Statutory compensation and control scheme

Option 1 will put in law the current non-statutory payment. It will enable government to settle compensation at £750 per culled animal with statutory backing.

The current flat rate payment was based on information available at the time it was introduced (2008). This took some account of “replacement value” of the affected animal and not just its actual value which at slaughter is simply its salvage value.⁵

The introduction of a statutory scheme will enable AHVLA to invoke other statutory powers to enter premises and test when there is a suspicion of bTB, and remove animals where necessary. This will particularly affect any future refusals. Any costs to business will depend upon the nature of refusal (whether they refuse any testing, or whether they comply with some), the nature of their business (breeders, fleece producers, trekking establishments) and whether disease is confirmed within their herd. As these are unknown, the following presents a stylised example to demonstrate the potential costs and benefits to business.

Scenario

Based on AHVLA advice that around 5 camelid keepers per year currently refuse voluntary blood testing and that 3 of these might be commercial businesses the scenario considers the future costs and benefits to 3 non-complying businesses per year.

Until now keepers could de-restrict their herds on the back of skin-tests alone; however from October 2014 combined skin and double blood testing will be mandatory. Therefore this scenario considers refusals for all testing rather than just blood testing.

Testing in camelid herds is not carried out under a regular surveillance system such as with cattle. Testing is prompted when keepers and vets are suspicious that disease may be present, such as when

⁵ The Appeal Court [Partridge Farms and the Secretary of State for Environment Food and Rural Affairs [2009]] accepted that flat rate payments are not discriminatory since the true value of any animal [in this case a pedigree bull] once it has tested positive for TB is the salvage value of its carcass [and that] the true value of the claimant's cattle was not materially different from any other [non pedigree] cattle which had been diagnosed with TB.

animals are displaying clinical signs. This assessment therefore assumes that disease is confirmed when testing is enforced.

6. Updates from consultation

After receiving responses from consulting with industry and the public a few decisions were made on the content of this assessment:

- Each herd is assumed to take 2 hours to handle. There were a range of responses from consultation suggesting that llamas can be very easy to handle (<1hr) or difficult to handle and may take longer than the 2 hours specified. Using data from the past 5 years, it is clear also that the majority of infected herds contain mostly alpacas (around 90%), which are easier to handle. Therefore the assumption has not been changed.
- A number of responses stated information regarding individual sales values of camelids, but in the absence of any robust evidence base www.alpacaseller.com remains the source used in this assessment. The website shows that the payment of £750 is at least equal to and in most cases higher than the minimum market values currently being traded. Whilst we recognise that some camelids can sell for more than the compensation value, a camelid with TB is worth its salvage value.
- Some respondents pointed out the existence of an insurance market for animals, in order to protect against losses from disease. Where keepers have taken insurance against TB, this would reduce the costs to them if disease is found and animals are lost. In the absence of substantial information regarding the incidence of an insurance market around camelids, we have not been able to take this into account in this economic analysis.
- No information on further sources on camelid numbers, herd sizes and businesses in England was provided which had not already been used.

7. Costs

Option 1 Costs to business

Labour

Under our best estimate there will be increases in costs to non-complying camelid keepers for gathering and presenting animals for the tests. Estimated at £128 per business; 6 testing events at 2 hours each (initial skin and follow-up blood testing event plus two clear skin and follow-up blood tests), with average hourly standard rate of £10.70, inflated for non-wage costs, for craft grade labour⁶.

Economic & personal loss

It is unclear how long an infected camelid might live before it develops clinical signs of TB and the disease becomes fatal. Veterinary advisors suggest a year (on average) is a reasonable estimate to use for this analysis, although there is a high degree of individual variation around that estimate depending on a number of factors such as the initial infective dose, route of infection, age of the animal, concurrent disease, etc. This will vary, and we illustrate it here with an estimate for a breeding camelid. Others are kept as pets, for wool and for trekking, so this is merely one example.

⁶ Nix 2013, p160

A breeding camelid with bTB, slaughtered one year earlier than its natural death, might mean lost offspring worth c£1,088 net of production costs⁷. This is an average of a small number of price values taken from www.alpacaseller.com rather than a distribution of prices, thus there may be a large number of camelids worth significantly less than £750.

Veterinary advice is that it is possible that a new-born camelid will contract TB through close contact if its mother has TB; therefore the value of this offspring is likely to be nil in a proportion of cases. Although no evidence exists to quantify this, veterinary advice is that there is a 10-50% probability of offspring contracting TB from an infected mother is a reasonable estimate. The best estimate assumes a 30% probability of the offspring being infected, or a 70% probability the offspring is not infected.

There will be some losses arising from any TB-free animals wrongly identified as infected by the tests (false positives). However, given the specificity of the combined tests (95-96% for the preferred blood test combination used in parallel), this is considered a low impact (4 false positive results for every 100 uninfected animals tested). For a herd of 37 camelids with 8 animals test-positive for TB, on average 1 animal may be falsely identified. This is valued based on the weighted average of female alpacas taken from www.alpacaseller.com as a proxy for the value of a healthy breeding camelid: £2,276.

Veterinary advisors estimate that the sensitivity of combined skin and blood testing may find 8 test-positive camelids per TB incident⁸ compared with skin testing alone. Loss for 8 breeding camelids that are found due to the extra testing (correctly or falsely) could be £8,465 per business:

$$[(7 \text{ true positive} \times \text{£}1088 \times 0.7 \text{ probability of offspring being healthy}) + (1 \text{ false positive} \times \text{£}2,276)] = \text{£}8,465$$

Total gross cost to keepers, per business, is estimated at £8,593 (loss of value plus keeper time for testing). This suggests that the three non-complying businesses in a year could face **gross costs of £26k** per annum (table 1).

Table 1 – Summary of best estimates (refuse all tests – find disease) gross costs

Best estimate	Yearly costs	10-year present value costs
Per business	£9k	£74k
3 businesses	£26k	£222k

Given uncertainty over the value of camelids, the high and low estimates explore the sensitivity of the results to higher and lower camelid values. As well as probability of infection passing to offspring.

Table 2 – Summary of low costs (refuse all tests – find disease) gross costs

Low estimate	Yearly costs	10-year present value costs
Per business	£7k	£59k
3 businesses	£20k	£176k

See Table 11 below for further details on how these estimates were calculated.

Table 3 – Summary of high costs (refuse all tests – find disease) gross costs

High estimate	Yearly costs	10-year present value costs
Per business	£10k	£89k
3 businesses	£31k	£268k

See Table 11 below for further details on how these estimates were calculated.

⁷ Based on sale price of young camelids from www.alpacaseller.com and production costs from Nix 2013. See annex for further details. Veterinary advice says that it is highly likely that a new-born camelid will contract TB via suckling milk if its mother has TB, thus the offspring is lost.

⁸ Dean et al. (2009) "Use of serological techniques for diagnosis of *Mycobacterium bovis* infection in a llama herd" and veterinary advice suggest a skin test sensitivity of approx 20%, with a combined skin and blood test sensitivity of approx 80% when the tests are used in parallel interpretation (i.e. animals that are positive to either test are removed as infected).

Gross costs to business may rise over time e.g. with inflation in camelid values, but it is highly unlikely that they will exceed £1m in one year. This would require >100 businesses to become affected and refuse bTB testing. As there are 250-300 camelid businesses in total, and a rate to date of about 9 new confirmed infections per year, this is not considered likely.

Unquantified costs

This includes the costs to Government of additional testing, post-mortems and haulage of infected animals. For keepers earlier loss of the infected animals may mean lost potential enjoyment that could have been derived from them living for an extra year with TB.

8. Benefits

Option 1 Benefits to business

Herd TB Control

Benefits to business include improved control of bTB resulting from dual blood testing of all skin test-negative animals. As mentioned above, veterinary advisors estimate that the higher sensitivity of combined skin and blood testing may find 8 test-positive animals per TB incident.

During the year or so in which an infected animal is assumed to survive with TB, it is likely that these infected animals will further spread the disease within the herd, or even to other premises, particularly in the final stages of the disease. If the infected animals are identified and culled early, rather than left to deteriorate and die (or remain latently infected in the herd after movement restrictions have been lifted), this may mean fewer infected camelids culled in total in the affected herd, a shorter period under movement restrictions, a lower risk of recurrent TB incidents and a lower risk of spreading TB to other camelid herds, thus benefitting all camelid keepers.

The Conlan et al. SOR model⁹ for TB transmission in cattle uses cattle herd numbers to establish a likely infection rate per animal. Based on an herd-size of 37 (the calculated camelid average), an infected animal is estimated to infect 0.2 further animals, on average, in a 1 year period. Veterinary advice is that the transmission rate for camelids is likely higher than for cattle given the lack of statutory surveillance meaning disease is given greater opportunity to develop before detection. Further, there are proportionately more whole-herd depopulations of camelid herds due to TB than cattle, which would suggest higher infectiousness of disease.

An upper estimate of the within-herd transmission rate for camelids is derived based on the SOR model estimate of 0.2, multiplied by 3.72. This is the relative proportion of a camelid herd slaughtered per confirmed TB incident in camelids (8/37) compared with cattle (8/133) as a guide for how much more infectious camelids could be than cattle.

This gives a range of 0.2 – 0.7 with a central estimate of 0.46 for the number of camelids each infected camelid might infect, in a year.

Therefore 7 infectious animals removed from the herd could have infected a further 3 animals over a 1 year period ($7 \times 0.46 = 3.22$). These are valued as healthy breeding females (as before). Avoided costs of losing 3 breeding camelids are estimated at approximately £7,000 ($3 \times \text{£}2,276$).

Compensation

The keeper will receive taxpayer compensation on the 8 test-positive camelids identified, compared with zero compensation if they are not identified and left to die in the herd a year later. $\text{£}750 \times 8 = \text{approx. } \text{£}6,000$.

⁹ Conlan et al. 2012 Estimating the hidden burden of bovine tuberculosis in Great Britain <http://www.ncbi.nlm.nih.gov/pubmed/23093923>

The private quantified benefit to the keeper is the avoided economic loss of losing extra camelids at around £7,000 and the transfer payments of compensation worth £6,000 per business = approx. £13,200.

Table 4 – Summary of best benefits estimates (refuse all tests – find disease)

Best estimate	Yearly benefits	10-year present value benefits
Per business	£13k	£113k
3 businesses	£39k	£340k

The high and low estimates explore the sensitivity of the results given higher and lower camelid values and by using the full range of the estimated within herd transmission rate.

Table 5 – Summary of low benefits estimates (refuse all tests – find disease)

Low estimate	Yearly benefits	10-year present value benefits
Per business	£9k	£76k
3 businesses	£27k	£228k

See Table 11 below for further details on how these estimates were calculated.

Table 6 – Summary of high benefits estimates (refuse all tests – find disease)

High estimate	Yearly benefits	10-year present value benefits
Per business	£18k	£157k
3 businesses	£55k	£472k

See Table 11 below for further details on how these estimates were calculated.

Unquantified benefits

Camelid keepers would be at less risk of additional and expensive TB cases, they would face reduced stress of operating businesses under restrictions as well as the emotional impact of losing further valued camelids. There may be avoided business productivity losses associated with the length of time on restrictions. There may also be a welfare gain of quickly culling infected animals rather than leaving them to die of TB.

Haulage and disposal fees would be paid by Government, rather than the keeper when the animal dies.

By introducing additional statutory powers the risk of infected camelids causing spill over effects into wildlife and neighbouring farms may be reduced by removing the reactors at an earlier stage. There is also a benefit to Government via lower risk of costs from additional TB cases.

Cost-benefit assessment

Table 7 – Best estimate cost benefit analysis

Best estimate - CBA	Yearly	Total 10-year PV
Total cost	£26k	£222k
Total benefit	£39k	£340k
Net benefit (NPV)	£13k	£118k

There is an estimated positive quantified net benefit to businesses, estimated to be approximately £118k over 10 years.

The low and high estimates explore the sensitivity of the results to changes in camelid values and varying the within-herd transmission rate. As well as the probability of onward infection to young.

Table 8 – Low cost/high benefit estimate summary

Best estimate - CBA	Yearly	Total 10-year PV
Total cost	£20k	£176k
Total benefit	£55k	£472k
Net benefit (NPV)	£34k	£296k

Table 9 – High cost/low benefit estimate summary

Best estimate - CBA	Yearly	Total 10-year PV
Total cost	£31k	£268k
Total benefit	£27k	£228k
Net benefit (NPV)	-£5k	-£40k

The sensitivity analysis shows that, on balance the policy is most likely to deliver a net quantified benefit to businesses. Under a high cost scenario where offspring are less likely to contract disease and are worth relatively more, there could be a small net cost of the policy. However, this does not take into account the non-monetised benefits of a shorter period under movement restrictions or reduced onward risk to other keepers of susceptible species. Including these in the assessment is considered to lead to an overall benefit to businesses.

9. Risks and uncertainties

Future levels of TB in camelids are uncertain, as is the future number of refusals to test. The number of camelids slaughtered due to additional testing is also uncertain given the wide range of infection prevalence within affected herds.

There is uncertainty around the TB testing refusal rate when mandatory blood testing is rolled out. There is potential to increase as some in industry are known to be sceptical of blood testing. If this were to happen then costs would increase due to more businesses being affected.

However, analysis suggests that even large increases in any of the assumptions used are highly unlikely to lead to gross costs to business of >£1m p.a.

Disease not found

Where non-complying businesses are tested and disease is not found then there would be no associated quantified benefits. However, there will still be the benefits of swifter lifting of movement restrictions. The costs to businesses are estimated at £43 per business for 2 testing occasions at 2 hours each time. These costs are extremely low and would be easily out-weighed by just 1 non-complying business finding disease.

10. Assumptions & references

Table 10 – Summary of assumptions made

Description	Assumption	Source
Number of camelids in England	28,000-34,000	Advice from British Llama Association (BLA) and British Alpaca Society (BAS)
Total number of camelid businesses in England	250-300	Advice from BLA and BAS
Number of camelids owned by businesses in England	10,000	Advice from BLA and BAS
Average business herd size	36.5 (33-40)	Calculated using Defra stats https://www.gov.uk/government/statistical-data-sets/other-tb-statistics
Number of refusals per year	5	Defra/AHVLA advice [it could be more when we roll out mandatory blood testing]
Number of business refusals per year	3	Estimated, Defra/AHVLA advice
Hours needed to test a herd	2	Estimated, Defra/AHVLA advice
Number of new camelid bTB herd cases confirmed by culture of <i>M. bovis</i> in England, per year	9 (range in 2008-2013: 6-14 per annum)	Defra stats: https://www.gov.uk/government/statistical-data-sets/other-tb-statistics
Average number of animals slaughtered per case	8.17	As above
Sensitivity of skin test only	<20%	Dean et al. (2009) "Use of serological techniques for diagnosis of <i>Mycobacterium bovis</i> infection in a llama herd" and veterinary advice
Sensitivity of combined skin and blood testing	c80%	Veterinary advice, based on AHVLA's report of TB blood test evaluation study in alpacas (Rhodes et al. 2012) and peer-reviewed published research: http://cvi.asm.org/content/19/10/1677 http://cvi.asm.org/content/18/12/2143
Proportion of false positive results to the dual blood test combination when animals are removed if positive to either test (parallel interpretation)	circa 4%	As above
False reactors per case	1.48 (36.5 x 0.04)	As above
True reactors per case	6.69 (8.17-1.48)	As above
Hourly wage for keeper	£10.70	Nix 2013 p.160 inflated by 30% to account for non-wage costs
Number of testing occasions per refusal	6	Estimated, based on AHVLA disease control policy
Sale value of camelid offspring	£1,171	www.alpacaseller.com April 2014
Production costs for camelids, per animal, per year	£83.70	Nix 2013, p.63. Based on lowland sheep production costs including a 50% surplus for young camelids.

Healthy female camelid average price	£2,276	www.alpacaseller.com April 2014
Cattle herd average herd size (2012)	133	https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/269740/structure-june-Englandsizedbands-07jan14.xls
Cattle herd average number of animals slaughtered per case	8	http://www.defra.gov.uk/ahvla-en/files/public-survreport-tb12e.pdf
Range of extra infections avoided per year - per animal found and culled(R0)	0.2 – 0.7	Based on Conlan et al. (2012) SOR Model http://www.ncbi.nlm.nih.gov/pubmed/23093923
Percentage of camelid offspring infected by parent camelid	10% – 50% (30% central)	Veterinary advice

Table 11 – Ranges for assumptions in analysis

Range of costs	Value of healthy animals	Weighted average of camelid values according to likelihood of camelid contracting TB from a parent	Within-herd transmission rate (R0)	False positives
Low	+10% (£2,504)	£544 (50% likelihood)	0.7	4%
Best	£2,276	£762 (central - 30% likelihood)	0.46 (central)	4%
High	-10% (£2,049)	£979 (10% likelihood)	0.2	4%

11. Wider impacts

Economic Impacts

Small firms impact test

Most businesses are likely to be small or micro in the camelid sector, an exemption for small and micro businesses would therefore likely apply to all businesses and undermine the policy.

12. One In, Two Out (OITO)

This measure to introduce a statutory camelid compensation scheme is in scope of OITO. It is a regulatory measure for which the monetised benefits to business are greater than the monetised costs and therefore takes ZERO NET COST status. We estimate that the policy generates an annual net cost to business of -£0.01m (in 2009 prices, discounted to 2010). See annex A for figures.

Annex A: Business costs and benefits contributing to EANCBC

Table A.1: Detail on costs and benefits for EANCBC calculation

Best cost estimate	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	PV	EA
Refuse all tests (6) find disease												
All 3 businesses - best												
Total gross cost	£25,779	£25,779	£25,779	£25,779	£25,779	£25,779	£25,779	£25,779	£25,779	£25,779	£221,901	£20,343
Total benefit	£39,467	£39,467	£39,467	£39,467	£39,467	£39,467	£39,467	£39,467	£39,467	£39,467	£339,721	£31,144
Total net benefit (NPV)	£13,688	£13,688	£13,688	£13,688	£13,688	£13,688	£13,688	£13,688	£13,688	£13,688	£117,820	£10,801

Low cost/high benefit estimate	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	PV	EA
Refuse all tests (6) find disease												
All 3 businesses - low												
Total gross cost	£20,401	£20,401	£20,401	£20,401	£20,401	£20,401	£20,401	£20,401	£20,401	£20,401	£175,605	£16,099
Total benefit	£54,838	£54,838	£54,838	£54,838	£54,838	£54,838	£54,838	£54,838	£54,838	£54,838	£472,028	£43,275
Total net benefit (NPV)	£34,437	£34,437	£34,437	£34,437	£34,437	£34,437	£34,437	£34,437	£34,437	£34,437	£296,424	£27,176

High cost/low benefit estimate	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	PV	EA
Refuse all tests (6) find disease												
All 3 businesses - high												
Total gross cost	£31,158	£31,158	£31,158	£31,158	£31,158	£31,158	£31,158	£31,158	£31,158	£31,158	£268,197	£24,588
Total benefit	£26,508	£26,508	£26,508	£26,508	£26,508	£26,508	£26,508	£26,508	£26,508	£26,508	£228,169	£20,918
Total net benefit (NPV)	-£4,650	-£4,650	-£4,650	-£4,650	-£4,650	-£4,650	-£4,650	-£4,650	-£4,650	-£4,650	-£40,028	-£3,670

No disease found	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	PV	EA
Refuse all tests (2) find no disease												
All 3 businesses - high												
Total gross cost	£128	£128	£128	£128	£128	£128	£128	£128	£128	£128	£1,102	£101
Total benefit	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Total net benefit (NPV)	-£128	-£128	-£128	-£128	-£128	-£128	-£128	-£128	-£128	-£128	-£1,102	-£101