

PRE-MOVEMENT TESTING IN ENGLAND: UPDATED ASSESSMENT OF COSTS AND BENEFITS, JANUARY 2007

1. Purpose

1.1 To review, in light of evidence to date, the costs and benefits assessment made in the original 2005 Regulatory Impact Assessment (RIA) to support introduction of pre-movement testing in England. See <http://defraweb/animalh/tb/premovement/index.htm>

2. Methodology

2.1 Benefits

2.1.1 These are assessed as costs avoided by preventing new incidents which arise from:

- TB being detected correctly by pre-movement tests;
- Timing of some movements and some herd tests being rearranged so movements take place within 60 days of the routine herd test;
- Existence of the measure deterring certain movements from taking place;
- Picking up infection earlier than otherwise would have been detected from routine surveillance tests.

2.1.2 The number of tests, reactors and IRs to date is based on Vetnet data from SVS/VLA.

2.1.3 The costs of incidents avoided includes costs associated with increasing test frequency to 1-2 yearly which would arise from new incidents in 3-4 year parishes, but not the additional costs of pre-movement testing that would arise in such herds. An updated assessment of benefit per incident has been used and is discussed further in Section 4.

2.1.4 The actual rate of identifying reactors from pre-movement tests to date is 0.16% (allowing for a small number of slaughters among IRs currently awaiting retest), which is lower than the 0.21% rate used in the original RIA for this age group of cattle (ie cattle > 15 months). That RIA rate was recognised at the outset as being highly uncertain and as critical to determining the effectiveness and the benefit of pre-movement testing. The RIA rate was estimated by reducing the average rate found in whole herd tests (WHT) (in herds not under restriction) to allow for the smaller interval between the previous WHT and the pre-movement test than the interval between successive WHTs, then adjusting for age of cattle moved. However, for reasons not fully understood, the actual rate has so far been lower. One contributory factor is likely to be the reduction seen in the number of new TB incidents in GB in January to September 2006 compared with the same period in 2005 – the provisional figures indicate a reduction of 11%.

2.1.5 The rate of reactors in pre-movement tested cattle under 15 months remains unknown but is expected to be substantially lower than in older cattle. In light of the uncertainty attached to reactor rate in younger cattle, alternative rates have been applied to demonstrate impacts on costs/benefits in Phase 2 and this is discussed further in Section 4.

2.1.6 The proportion of cattle movements from high incidence herds to low incidence areas is slightly lower than previously estimated and emerges from extensive further work with CTS data. This means that the number of breakdowns in clean areas prevented in destination herds at first move is lower than in the original RIA.

2.1.7 It is recognised that detection of a reactor does not necessarily prevent a TB incident in the destination herd. This is for several reasons. The original RIA and the updated cost benefit assessment presented in December 2006 took into account two reasons: “false positives” (see below) and the fact that TB incidents due to other causes would be expected in some destination herds in high-risk areas (hence diseased cattle movements to these herds would prolong or enlarge a disease incident rather than add to the number of recorded incidents). Following discussions with stakeholders in December, this further updated assessment now also allows for the fact that some movement-caused incidents may involve two or more reactor cattle moving together (either from a farm or market) : thus two reactors might cause only one further new TB incident. This reduces the benefits attributed to pre-movement testing.

2.1.8 The benefits of earlier detection of disease in the herd of origin as a result of pre-movement testing were not considered in the original RIA but are included in the new assessment.

2.2 Costs

2.2.1 These arise from:

- Costs of pre-movement tests;
- Lost benefits from movements that are rearranged or foregone in order to avoid costs of testing;
- Costs incurred from ‘false positives’.

2.2.2 Costs of TB pre-movement testing are based on emerging evidence on veterinary charges from DNV’s Review of veterinary capacity, and TB test batch size information from the SVS. Typical fee rates found by the review are very similar to those used in the original RIA (taken from a small survey of BCVA members). TB testing batch sizes have been slightly smaller than assumed in the RIA, so average testing costs per animal have been slightly higher. The number of cattle tested together is likely to be greater under Phase 2, and this is expected to lead to a reduction in average cost per animal tested (conservatively assumed for the Phase 2 assessment to be a marginal reduction).

2.2.3 The proportion of false positive test results cannot be determined without very intensive post-mortem examinations and it is, therefore, incorrect to regard as “false positives” all cattle that reacted to the test but failed to show visible lesions of TB at post-mortem. Only a proportion of reactors with no visible lesions is due to non-specific reactions to the tuberculin test and this proportion varies with the underlying prevalence of infection in a population. The proportion of genuine ‘false positives’ assumed in the original RIA (0.2% or 1 in 500 animals tested) has quite clearly not been occurring in the actual pre-movement tests so far this year and the assumed proportion is now recognised as too high. Scientific advice is that:

- 99.99% would be a more realistic estimate of the specificity of the comparative skin test test (equivalent to a false positive rate of 0.01% or 1 reactor in 10,000 animals tested in uninfected herds); and
- false positive animals (non-infected reactors) are epidemiologically important only in populations with a very low prevalence of *M. bovis* infection (i.e. in 3-4 yearly tested herds with no history of TB).

2.2.4 It is also the case that a false positive is likely to cause a breakdown in the destination herd if it is moved and then tested in that herd, so there are still benefits in detecting any such animals before movement.

2.2.5 Fifteen percent of all herds in which IRs are identified are put under restriction due to the herd having suffered a confirmed breakdown in the last 3 years. These herds have higher restriction costs than the remaining 85% of herds with IRs, in which only the individual animal is subject to restriction.

2.2.6 Actual costs of publicity, administration and enforcement are not available so the values assumed in the previous RIA have been included.

3. Revised estimated costs and benefits based on evidence to date

3.1 As shown in Table 1 the revised assessment estimates an overall net benefit from moving to a pre-movement testing policy that applies to cattle over 6 weeks of age. This is consistent with the original RIA. The relative magnitude of costs and benefits for the revised assessment and the original RIA are shown in Figure 1.

Table 1: revised costs and benefit assessment

(all figures are per year)	Phase 1 (cattle > 15 months)	Phase 2 (cattle over 6 weeks and under 15 months)	Phase 1 + Phase 2 (cattle over 6 weeks)
New incidents avoided	412	198	610
Total benefits	£7.09 million	£3.39 million	£10.48 million
Total costs	£3.20 million	£2.69 million	£5.89 million

Net benefits	+£3.89 million	+£0.70 million	+£4.59 million
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3.2 Overall, the costs of pre-movement testing cattle between 6 weeks and 15 months are very similar to the total costs estimated in the original RIA.

3.3 The number of disease incidents prevented in a full year by Phase 1 are now expected to be about 20% lower than in the original RIA (110 fewer incidents). This is mainly because of the lower detected rate of reactors discussed above. Another factor is the altered movement patterns which meant some cattle avoided testing by moving before 27 March 2006 or moving before 15 months of age. However the unit benefit is now assessed as higher and so the overall total benefit is only slightly lower.

3.4 The net benefit of pre-movement testing cattle between 6 weeks and 15 months is now assessed as slightly higher than previously, but the number of new bTB incidents prevented in destination herds is about the same.

3.5 For phase 2, evidence indicates that, as previously predicted, incidence in cattle < 15 months (when averaged) is about a third of that of older animals. The testing cost of preventing an outbreak from movement of these animals (estimated at approaching £14,000 per incident directly prevented) is therefore, as previously expected, higher than for older animals (£8,000).

3.6 However, an important feature of full operation of the policy covering all ages of moving cattle from 6 weeks to 15 months, is that it will end the incentive which appears to have caused a shift in movements to avoid pre-movement testing during phase 1. Full implementation of Phase 2 thus gives additional benefits in disease control which are expected to be seen through more cattle being tested *over* 15 months of age.

3.7 The policy needs to operate for a longer period for the full benefits in terms of TB incidents prevented to be evident.

Figure 1

Comparing the costs with the TB risks avoided
(Moving up the page means more risk avoided. Moving to the right means higher costs.)

