Regional Six-monthly Report of Descriptive Bovine TB Epidemiology for the Edge Areas of England

Regional office: APHA England North: Cheshire Edge

Mid-year (first six months) report for 2015

1. Cattle industry in the Edge Area of the Region

![Figure 1: Cheshire Edge & High Risk Area in relation to other counties.](image)

Cheshire is included in the North region of the APHA regions and is split into a High Risk Area (HRA) south of Nantwich, extending from Malpas to Betley, and the rest of the county has been included in the Edge Area (red hatched) under the TB England Eradication Strategy since 2014. Further north the region includes the counties of Lancashire, Cumbria, Yorkshire and Northumberland, Greater Manchester and Wirral which are all 4 year TB testing areas and are classed as part of the Low Risk Area (pink). To the east, Cheshire borders Greater Manchester and Derbyshire; to the south, Staffordshire; to the west, North Wales and Shropshire, and to the north, Lancashire and Wirral.

The north of the county is bordered by the large urbanised areas of Liverpool and Manchester, the Manchester Ship Canal and the River Mersey. It is divided into two local authorities, Cheshire East and Cheshire West and Chester.

There are two livestock markets, Beeston Castle Auction and Chelford Market which joined together under the same management in 2014. Currently, both markets are very busy with cattle sales which attract buyers from all over the country. Beeston is situated south of Chester in the west of Cheshire and Chelford is situated in the north east of the county near Knutsford. Both markets operate slaughter collections and sales for TB restricted cattle.
which some farmers prefer as they are selling live weight. Just south-west of Cheshire, in Shropshire, there is another busy livestock market at Market Drayton and one in Leek Staffordshire south-east of Cheshire. Many Cheshire farmers also use these markets to trade cattle.

Cheshire has several cattle abattoirs: Beesons at Haslington, near Crewe and close to the M6, is contracted by APHA and DEFRA to slaughter TB reactors. Hewitts of Huxley, near Tarporley and Jacksons near Knutsford both kill a variety of species including cattle.

Cheshire is predominantly a dairy farming county with many Pedigree Holstein Friesian herds although there are also a large number of beef suckler and beef fattening herds. In recent years, dairy herds have increased in size and the New Zealand style farming system has become more common across Cheshire. Share farming has also increased in popularity and increased the fragmentation of herds with dispersal of cattle all over the county and beyond into the High Risk Areas of the neighbouring counties of Staffordshire, Shropshire and into North Wales. The use of robotic milking facilities has increased the amount of zero grazing practised in a few large dairy herds across the county.

The more traditional dairy herds are grazed in summer and housed over the winter. Batch spring calving is increasing in popularity for relative ease of management over winter with the New Zealand systems.

Most farms make grass silage and over the years, to support higher milk yields, maize has become a very popular feed in Total Mixed Rations (TMR) which is fed all year round on many dairy farms. TMR is mixed on farm using straights stored in bulk and fed generally in feed passages both inside and on the outside of buildings.

Grazing practices vary between; strip grazing, set-stocking and paddock grazing. The use of mineral licks is common in Cheshire and many of these are accessible to wildlife when used at pasture. Most dairy cattle, with the exception of the New Zealand systems, are housed over winter in cubicle sheds with feed passages either inside or on the outside of the sheds.

Artificial insemination is utilised in many dairy herds with very few relying on natural service. Most farmers purchase bulls and replace them every 2-3 years. Many farmers breed their own replacement heifers although there are a few which are classed as flying and buy all replacements which may be sourced from anywhere in the UK. Many replacements heifers have also been sourced from mainland Europe in recent years. There appears to have been more of a shift towards risk based trading and sourcing replacements more carefully for many farmers. Initially they may like to be classed as closed herds but in reality they may buy a few replacements or import some in calf heifers as replacements.

Truly closed herds are relatively uncommon now as many use multiple sites for management purposes as their herds have increased in size. They may also use heifer rearers where the heifers leave the main farm as calves and return at the point of calving. Some of these are dedicated rearers for one source and others rear for several farmers. Others maintain a single site but may occasionally purchase bulls or replacement heifers to vary the bloodlines.

The majority of dairy herds practise vaccination for BVD, IBR and leptospirosis and many monitor for Johnes disease and use parasite control regimes. Many of the dairy farms have routine veterinary visits 2-4 times per month depending on their size.

There are a relatively large number of beef suckler herds varying in size. These are distributed throughout Cheshire. There is also a moderate number of beef fattening units which tend to house the cattle all year round with dynamic populations of cattle and with most moving stock direct to slaughter on a weekly basis providing a good level of slaughterhouse surveillance for TB.

The beef suckler herds are generally grazed in summer and occasionally out wintered or loose housed. Intensive finishing units will keep cattle continuously housed from purchase and are usually fed a cereal based diet often including maize until slaughter.
In the Cheshire Edge, there has been an increase in the number of non-grazing AFUs over the past year. Seven are in the Edge and one in the HRA. There are also ten pre-movement exempt finishing units in the Edge.

There are no areas of common grazing in Cheshire.

Number of cattle premises by size band in the Edge Area of the region at 1 January of the reporting year.

<table>
<thead>
<tr>
<th>Cattle per premises</th>
<th>0</th>
<th>1 - 50</th>
<th>51 - 100</th>
<th>101 - 200</th>
<th>201 - 350</th>
<th>351 - 500</th>
<th>501+</th>
<th>All</th>
<th>Mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of premises</td>
<td>12</td>
<td>646</td>
<td>216</td>
<td>260</td>
<td>231</td>
<td>100</td>
<td>92</td>
<td>1557</td>
<td>153</td>
<td>73</td>
</tr>
</tbody>
</table>

There are 92 cattle herds in Cheshire with over 500 cattle and a small number have thousands of cattle (dairy). The average herd size is 153 although most commonly there are a large number of herds with fewer than 50 cattle (usually beef).

Cattle breed purpose: The majority of cattle breeds in Cheshire are dairy with just under a quarter being beef.

<table>
<thead>
<tr>
<th>Number of cattle</th>
<th>Beef</th>
<th>Dairy</th>
<th>Dual purpose</th>
<th>Unknown</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>56366 (23.7%)</td>
<td>172312 (72.3%)</td>
<td>9477 (4.0%)</td>
<td>65 (0.0%)</td>
<td>238220</td>
</tr>
</tbody>
</table>

Figure 2: Cattle breed purpose in Cheshire 2015.
Density of cattle and cattle premises at January of the reporting year.


Figures 3 & 4 show the cattle and premises density data for the whole of Cheshire. North Cheshire has far fewer cattle and cattle premises than further south and east. In terms of TB breakdowns there are more breakdowns in the more densely populated areas especially to the east of Cheshire. The most densely populated cattle premises lie to the east where there are smaller holdings.

2. Geographical distribution of bovine TB breakdowns (new and ongoing) in the Edge Area of the Region

The geographical distribution of new breakdowns in 2015 appears to follow the same pattern as last year with the majority of cases being concentrated to the east of the county and with some bordering the HRA in the south of the county. There have been very few new breakdowns in the north of the Cheshire Edge. Likewise the ongoing breakdowns carried over from last year are centred in the east and particularly the Siddington, Marton, Henbury areas just south of Macclesfield and north of Congleton. The geographical distribution of new breakdowns in Cheshire for 2015 can be seen in figures 5, 6 & 7 below.
Density of TB reactors and slaughterhouse cases in TB breakdowns per km²

Figure 5: Density of skin test reactors, IFN-gamma test reactors and slaughterhouse cases in OTF-W breakdowns per km² taken in the reporting period
Figure 6: Density of skin test reactors, IFN-gamma test reactors and slaughterhouse cases in OTF-W and OTF-S breakdowns per km² taken in the reporting period
Figure 7: New OTFW breakdowns detected in the Cheshire Edge Area during the first half of 2015.
Figure 8: Ongoing OTFW breakdowns in the Cheshire Edge Area carried over from 2014
3. Summary of the Edge Area Regional Headline Cattle TB Statistics

![Bar chart showing the annual numbers of new TB incidents in Cheshire from 1994-2015.](image)

Prior to 2001, there were very few cases of bovine TB in Cheshire. In 2002, there was a dramatic seven-fold increase in the number of cases (29 cases recorded vs 4 cases in 2000) probably due to the fact that no testing took place during the FMD outbreak in 2001. In the past 20 years in Cheshire, the number of cases has increased by over 1760% (from 10 cases in 1994 to 176 cases in the whole of Cheshire in 2014). In 2013, there were 143 new breakdowns recorded for the whole of Cheshire and the average increase in cases each year was 29% compared to previous years (range 7-43%). In previous years, the ratio of OTFS to OTFW cases has been greater with the exception of 2011. In 2007, there was another FMD outbreak which might explain the slight decrease in cases overall as the TB testing decreased that year due to restrictions on cattle and the risks of spreading FMD virus. The confirmation rate in the Edge has continued throughout 2014 and into this reporting period.

![Cheshire Edge TB cases 2014-15](image)

**Figure 10: Cheshire Edge TB breakdowns 2014-15**
This year so far, there has been a relative decrease in new breakdowns compared to the same period last year. In the first half of this year there have been 52 new breakdowns in the Edge Area of Cheshire (36 OTFW cases and 16 OTFS cases) compared with 77 in the same period last year (see table below). In figure 10 above, in 2014, there were two spikes of cases in February and September which would be expected to correlate with testing before turnout and as housing starts to reflect the changes in herd testing volumes for management purposes. In the first six months of 2015, there have been no clear spikes in herd breakdowns and it cannot be clearly explained (see figure 10 above) especially in view of the six monthly herd testing in place from the beginning of the year. Bovine TB in the Cheshire Edge is likely to be establishing both in the cattle population and the wildlife population as evidenced by the infected badgers found on the University of Liverpool survey last year. Some of the new OTFW breakdowns have had previously unconfirmed incidents and this appears to be a common pattern in Cheshire indicating initial exposure with establishment and identification of disease at a later date. However, there are also new breakdowns in herds which have not had previous disease incidents, many of which are homebred reactors in herds with no or minimal purchase history which strengthens the likely wildlife link in Cheshire.

In recent years, the testing frequency has increased in Cheshire from large areas of 4 yearly testing to 12 monthly testing in 2013 and this may account for the sharp increase in the number of cases in 2014 as herds were being tested more frequently in totality. However, endemic infection should also be considered in some areas with continuous lateral spread over time. Cattle measures have been increased significantly this year in the Cheshire Edge so this is difficult to explain and more data will be available at the end of year report once the second tranche of six monthly herd testing data is available.

The distribution of new breakdowns in the Edge appears to be sporadic in some areas with previously “clean” areas becoming affected (more northerly and westerly). There are several possible explanations although the exact reasons remain obscure at the time of this report. Even with the genotyping data, there may be no clear conclusions as to the exact source of disease in some cases especially in breakdowns with previous incidents and with locally purchased stock in the interim. The vast majority of OTFW cases in the Cheshire Edge are type 25 or 25a (32 cases) and type 17 & 17a (4). There are no “exotic” genotypes in this reporting period.

Several persistent breakdowns have resolved earlier this year. No extra TB testing measures have been employed so this is hard to explain. One of the farms started a badger vaccination programme last year. Post-breakdown TB testing will be due later in 2015.

The overall herd level statistics are shown below

<table>
<thead>
<tr>
<th>Herd-level statistics</th>
<th>Cheshire Edge (first half 2015)</th>
<th>Cheshire Edge (first half 2014)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Total number of cattle herds live on Sam at the end of the reporting period</td>
<td>1446</td>
<td>1453</td>
</tr>
<tr>
<td>(b) Total number of herd tests carried out in the period</td>
<td>1410</td>
<td>1507</td>
</tr>
<tr>
<td>(c) Total number of OTF cattle herds TB tested during the period for any reason</td>
<td>907</td>
<td>980</td>
</tr>
<tr>
<td>(d) Total number of OTF cattle herds at the end of the report period (i.e. herds not under any type of TB02 restrictions)</td>
<td>1360</td>
<td>1100</td>
</tr>
<tr>
<td>(e) Total number of cattle herds that were not under restrictions due to an ongoing TB breakdown at the end of the report period</td>
<td>1388</td>
<td>1283</td>
</tr>
<tr>
<td>(f) Total number of new TB breakdowns detected in cattle herds during the report period:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• OTF status suspended (OTFS)</td>
<td>16</td>
<td>30</td>
</tr>
<tr>
<td>• OTF status withdrawn (OTFW)</td>
<td>36</td>
<td>47</td>
</tr>
<tr>
<td>(g) Of the new OTFW herd breakdowns how many:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Occurred in a holding affected by another OTFW breakdown in the previous three years?</td>
<td>19</td>
<td>N/A</td>
</tr>
<tr>
<td>• could be considered secondary to a primary breakdown based on current evidence?</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>• were triggered by skin test reactors or 2xIRs at routine herd tests</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>• new OTFW breakdowns triggered by skin test reactors or 2xIRs at other TB test types (forward and back-tracings, contiguous, check tests, etc.)</td>
<td>16</td>
<td>14</td>
</tr>
</tbody>
</table>
- were first detected through routine slaughterhouse TB surveillance

<table>
<thead>
<tr>
<th>(h) Number of new breakdowns revealed by enhanced TB surveillance (radial testing) conducted around those OTFW herds (Derbyshire):</th>
</tr>
</thead>
<tbody>
<tr>
<td>OTFS</td>
</tr>
<tr>
<td>OTFW</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(i) Number of OTFW herds still open at the end of the period (including any ongoing OTFW breakdowns that began in a previous reporting period)</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(j) New confirmed (positive <em>M. bovis</em> culture) incidents in non-bovine species detected during the report period (indicate host species involved)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 alpaca herd</td>
</tr>
</tbody>
</table>

**Animal-level statistics (cattle)**

<table>
<thead>
<tr>
<th></th>
<th>first half 2015</th>
<th>first half 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Total number of cattle tested in the period (animal tests)</td>
<td>173949</td>
<td>167969</td>
</tr>
<tr>
<td>(b) Reactors detected:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• tuberculin skin test</td>
<td>254</td>
<td>448</td>
</tr>
<tr>
<td>• additional IFN-gamma blood test reactors (skin-test negative or IR animals)</td>
<td>334</td>
<td>296</td>
</tr>
<tr>
<td>(c) Reactors per breakdown</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>(d) Reactors per 1000 animal tests</td>
<td>3.38</td>
<td>4.49</td>
</tr>
<tr>
<td>(e) Additional animals identified for slaughter for TB control reasons (DCs, including any first-time IRs)</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>(f) SLH cases (tuberculous carcases) reported by FSA</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>(g) SLH cases confirmed by culture of <em>M. bovis</em></td>
<td>3</td>
<td>9</td>
</tr>
</tbody>
</table>

The herd level statistics show that 1410 TB herd tests have been carried out on 1446 herds in this reporting period. The number of new breakdowns in the Edge area is lower than the same period last year (52 compared to 77 in the first half of 2014). This observation has also been noted in the HRA of Cheshire where there has been no change in TB testing frequency unlike the Cheshire Edge. It is possible that the policy of breaking links may have helped plus the fact that farmers have become more aware of movements of cattle in and out of both areas.

The number of reactors per 1000 animal tests has also decreased compared to last year and the reason may be that with the increased TB testing, disease is not spreading as much within the herds. Again, a complete dataset for the whole year will be more meaningful.
4. Suspected sources of *M. bovis* infection for all the new OTF-W breakdowns identified in the report period

<table>
<thead>
<tr>
<th>Most likely origin</th>
<th>Provisional</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction (e.g. purchase) of infected animal(s)</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Local - lateral spread from neighbouring holdings:</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>• exposure to infected wildlife e.g. badgers</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>• other farmed species</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>• recrudescence of residual infection from a previous TB breakdown</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>• infected human source</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Undetermined/obscure</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Other (explain)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>33</td>
<td>3</td>
</tr>
</tbody>
</table>

From DRF data, before genotype information is available, many of the sources of breakdowns are attributed as obscure or wildlife infection. Two of the newly resolved breakdowns have been attributed to wildlife in the final assessment and one to purchase. Further data for final assessment of sources will be available in the next report.

<table>
<thead>
<tr>
<th>Probability of introduced <em>M. bovis</em> infection introduced via cattle movements</th>
<th>Probability of isolated, sporadic ('one-off') breakdown, without secondary local spread from the index case</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Likely (no secondary breakdowns detected)</td>
<td>Possible (no secondary breakdowns detected, but dataset incomplete)</td>
</tr>
<tr>
<td>Definite</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Likely</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Possible</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Not likely (indigenous infection in the locality)</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

06/237/0029
Two thirds of the new OTFW breakdowns in the Cheshire Edge area are in dairy herds which reflects the overall demographics of Cheshire. The remainder of the breakdowns are in beef herds divided between fatteners and suckler herds.

Over half of the OTFW breakdowns have been attributed to wildlife sources with the remainder of cases being attributed obscure reasons and only 4% due to possible purchased disease.
Just under a third have been attributed to bought-in cattle in mainly non-grazing fattening units in the Cheshire Edge. The majority cite wildlife as a possible source especially in grazing fattening herds. This appears to be in contrast to other areas where fattening herds are more likely to purchase disease via cattle. This observation in Cheshire could be due to the fact that there is known infection in the badger population and the spoligotype and genotype information is overwhelmingly 25 & 25:a. Often, the reactors have been sourced from farms with no previous history of disease but they may have originated from the HRA and purchased infection cannot be completely ruled out in these cases due to the volumes of purchased stock.

Wildlife has been cited as a possible source for over two thirds of OTFW breakdowns in suckler herds in the Cheshire Edge. These herds are less likely to purchase many stock other than stock bulls and are often smaller herds of less than 50 cattle.
In figure 15, the herd size distribution of all cattle herds in the Cheshire Edge is weighted more to large numbers of smaller herds and a few very large herds. The OTFW breakdowns appear to be more prevalent in herds of between 101-350 cattle plus, which is consistent with larger herd sizes being reported as a risk factor for bovine TB. Including all Edge Breakdowns in Cheshire, peak numbers of breakdowns occur in herd sizes of 201-350 with another peak in smaller herds of 51-100.

Larger herds tend to be more fragmented over several premises than the smaller herds and some may also be zero grazed. Zero grazing increases the likelihood of ingesting potentially contaminated grass that may have been avoided with free choice. There may also be movements between risk areas via heifer rearing premises or seasonal grazing. The cattle stocking densities and movements between premises may significantly increase the risk within the herd.
5. Overview of the bTB control programme in the Edge Area and assessment of its effectiveness

5.1 Edge Testing Policy

- Six-monthly herd testing was introduced into the Cheshire Edge Area on 1st January 2015, to replace annual herd testing and radial testing around new OTFW incidents;

- This has resulted in ten new OTFW breakdowns where TB has been disclosed in herds much earlier than it would have been under annual herd testing, thus proving to be a very valuable measure;

- Systematic interferon-gamma parallel blood testing of all herds with OTF status withdrawn continues and is proving to be valuable in shortening the length of time under restrictions, with a few exceptions where exposure to infection continues;

- All CTS links with herds in other bTB risk areas have been broken, so that cattle movements are reportable and statutory pre-movement TB testing is easier to monitor and enforce;

- All herds affected by bTB breakdowns (OTFW and OTFS) continue to require two consecutive herd tests with negative results on severe interpretation to regain OTF status;

- Discretionary interferon-gamma testing has been applied in OTFS herds persistent or unexplained breakdowns;

- IRs have been removed as direct contacts in breakdowns confirmed, with visible lesions of TB found at slaughter on several occasions. The removal of IRs with subsequent lesions has reduced the risk of leaving residual infection in those herds.

5.2 Unusual bTB breakdowns

Large numbers of reactors were found on a beef store premises near Crewe, close to the Staffordshire border. The case was disclosed on a pre-movement test of 18 heavy store cattle where two skin reactors were disclosed both with lesions at slaughter. Ten days later, a slaughterhouse case was disclosed. The remainder of the cohort group were gamma tested immediately and 17 positives were disclosed, 11 of which had lesions at slaughter. Check testing of the remainder of the herd disclosed two skin reactors and 12 gamma positives. Both skin reactors had lesions. Cattle with lesions were disclosed subsequently at herd testing and the case is ongoing. The case is considered unusual as clear herd testing had been carried out three months before the initial reactors were disclosed. The reactor cohort group contained a number of traced cattle which had been TB tested clear on several occasions but originated from another Cheshire holding as calves. In the previous report for Cheshire, this holding was mentioned as being the most probable source of disease caused by young calves ingesting infected milk from a tuberculous cow. Investigations are still ongoing but the genotype matches the farm of origin identified as genotype 25a. As this is the most common genotype found in Cheshire, a conclusion may never be reached as to the definitive source in this case.

There have been no known cases of M. bovis infection in humans in the Cheshire Edge.

There has been no suspicion of fraudulent reactors and none involving producer-retailers of raw milk or open farms in this reporting period.

5.3 Other Testing Measures

Some exemptions for TB testing have been given to beef fatteners in the Edge Area of Cheshire. The criteria are quite strict and are as stated in the APHA Ops Manual which states that there should be no breeding of cattle; direct movement to slaughter; housed cattle; ongoing slaughterhouse surveillance. Routine six-monthly TB tests for those herds are still marked forward to ensure reviews are done and activities are verified with cattle tracing system (CTS) checks.

There are no designated ‘potential hotspot’ areas in Cheshire.

In response to the M. bovis positive cases in the badgers submitted to the University of Liverpool survey last year, no radial testing was done as the genotype information was delayed until the middle of this year. All herds near the sites of the infected badgers will either be on six-monthly herd testing now or will be on breakdown testing in the HRA.
5.4 Other Control Measures
The monitoring regime and enforcement actions following overdue skin testing have significantly reduced the number of overdue TB tests in Cheshire compared to previous years. It is thought that the financial penalties imposed by overdue TB testing and the zero tolerance policy are actively discouraging farmers to deliberately delay skin testing. Due to the radial testing and increased skin testing in the Edge Area of Cheshire, OV resourcing is being stretched, but many practices are addressing this by employing more staff to undertake TB testing or extending the testing week to include weekends. The reductions in compensation for overdue TB testing also acting as a disincentive and appear to be working well in Cheshire.

OV audits
OV audits are being undertaken on an ongoing programme of unannounced audit visits. To date, no major areas of non-compliance have been identified and the OVIs accept that this is being done for quality assurance. A change in farmer attitude has been noted in Cheshire in recent years and farmers are now much more aware of the standards and importance of correct TB skin testing. The Veterinary Delivery Partnership has also instigated OV auditing as part of the contract in place. TB tester training has been outsourced to Improve International.

Cheshire TB Eradication Board
The Cheshire TB Eradication Board has been less active than last year, but there have been fewer issues to discuss in this reporting period as the majority of policy changes were discussed last year. The increased cattle herd testing in the Edge has generally been well accepted in recognition of the need to identify disease early.

Enforcement & partner liaison
Active monitoring of market activities including movement recording and disinfection between gatherings and slaughter gatherings is continuously taking place in both east and west authorities. There is also good liaison with neighbouring authorities in other counties. Public Health England is also regularly informed and consulted about OTFW TB cases and incidents of confirmed *M. bovis* infection in non-bovine domestic species.

5.5 Risks, Issues and Recommendations

Resource - The amount of radial testing in the county last year increased the strain on local resources both within the APHA and in local OV resources. The six-monthly TB testing appears to have relieved some of the resource strain particularly in OV resources by enabling better planning with testing more evenly spread rather than being requested at short notice with large numbers of premises.

Liaison – A recommendation for more joined up working with neighbouring regions and shared data made available. This is difficult to arrange with resource issues.

Interferon-gamma testing It is proving to be very valuable in TB breakdowns especially when used early in the breakdown. Issues still include lab capacity at busy times in combination with large herd sizes in Cheshire. A recommendation would be to enable more flexibility in capacity as some sampling has been delayed until the second SIT due to lab capacity issues which is far from ideal.

Risks to the LRA – As outlined in previous sections, there is ongoing stakeholder concern that bTB is progressing towards the LRA in the Greater Manchester/ Stockport area. However, a one-off check test of all herds in this area was carried out in January-April 2015 and no further OTFW cases were revealed which did not have strong epidemiological links with the Edge Area. A farmer-led and NFU-funded initiative has been set up in the Stockport area to gather data on road kill badgers in partnership with the University of Liverpool. The second tranche of radial TB testing will also be performed late autumn.

Wildlife monitoring – it is essential to monitor for infected wildlife if the spread of infection is to be reduced. More resource is required to invest in providing better biosecurity advice for the farming community to ensure that herds are more thoroughly protected. A recommendation for continued monitoring of infection in wildlife will provide valuable information for epidemiologists, case officers, vets and farmers.

Increase the controls and consultation with local APHA staff regarding rehabilitation of badgers and release sites and encourage TB testing and vaccination of rehabilitated wildlife.

Badger Vaccination initiatives – it is important to maintain support for badger vaccination initiatives in the Edge particularly in the west of the Edge Area of Cheshire, where the apparent prevalence of bTB is much lower than in the East, and to actively encourage good quality research in order to provide farmers with scientific evidence of its efficacy in the longer term. Continue to support the Badger Edge Vaccination Scheme and to support liaison with stakeholders. This year the board of the Cheshire Wildlife Trust made the decision to cease all badger vaccination initiatives on other farms due to other priorities within the Trust. This has resulted in the existing farm
Other wildlife control measures – due to the logistical difficulties of vaccination alone, other wildlife control measures must be explored as there is now strong evidence of badger infection with M. bovis in Cheshire particularly in East and South Cheshire. With the six-monthly increase in cattle control measures being undertaken, it is important to support this in future with additional wildlife control measures in order to ensure a greater effect of slowing the spread of disease in Cheshire. Together with the combination of vaccination in the West and North, this should ensure that we are providing robust disease controls in the county and reducing the risks of ongoing exposure to disease.

Review of policy in the HRA - A recommendation would be for a review of policy to increase TB testing in areas buffering the Edge to monitor for disease more frequently and to monitor the wildlife populations in these areas too. There are no geographical or physical barriers between the Edge and HRAs so it is important to monitor disease more closely to attempt to slow the rate of spread of continuous disease and wildlife from these areas. Similarly, it would be logical to include the whole of Cheshire in the Edge to ensure further measures are available to all herds.

6. Established and Emerging Infected Areas

There are no major changes to the established areas as described in the 2014 report. However, there have been some interesting observations regarding a shift in genotype found in an area between Middlewich and Crewe which will be described further in this report.

Bosley cluster – River Dane boundary

This is an area to the far east of Cheshire bordering Staffordshire and situated east and northeast of Congleton. The area of interest is bounded by the river Dane from the east extending to the west towards North Rode. The other side of the River Dane is Staffordshire. Further north the land rises along the A54 towards Buxton in Derbyshire and is much less densely populated with cattle. Also traversing the area is the A523 main road from Macclesfield to Leek.

Since the last report fewer breakdowns have been disclosed in this area. Many of these are smaller herds and wild red deer and badgers are commonly seen in this area. Two km further east towards Congleton, five badgers have been identified with M. bovis infection as part of the RTA survey. These have been found in areas where there have been historical breakdowns involving genotype 25:a. The spoligotypes of the badgers has been disclosed as 25 with genotyping still pending in some cases.

The locals have noted that badger numbers have increased in the area compared to previous years. Just over the border in Staffordshire is the Rudyard/Leek area which has had a lot of TB breakdowns over the years and an M. bovis positive badger has been identified in this area with spoligotype 25, again consistent with local cattle infection. Local APHA staff still consider this to be an endemic area compared to other parts of Cheshire.

Siddington/Marton/Knutsford clusters

This area lies further west from the Bosley area on the other side of the River Dane and extends northwest from Congleton towards Knutsford and eastwards towards Holmes Chapel and Goostrey. The area is approximately 100 sq kms. and contains the parishes of Lower Withington, Marton, Siddington, Gawsworth, Swettenham, Capesthorne, Over Peover and Chelford. In this area, during the reporting period, there were 30 OTFW breakdowns most of which are or have been genotype 25:a in the recent past. M. bovis positive badgers have been found 2km southeast of this area towards Bosley and approximately 5km to the north of this area at Morley. In the Lower Withington area in particular, there has been a high concentration of breakdowns and there is also an active sand quarry here too where reportedly large numbers of badgers reside and indicates the soil type in the area being highly favourable for habitation of burrowing wildlife. Further west and north there are similar cases, with many recurrent breakdowns. Towards the north-western periphery of this area, there are still a few OTFS2 cases which may indicate that they are more at the true edge of the disease.

Warmingham-Middlewich area

Several large herds were disclosed as OTFW breakdowns at the end of last year and in this reporting period in this area. Historically, there have been cattle breakdowns in the mid-2000s and up to 2014 in this area with genotype 25:a. One large dairy herd in particular is classed as closed as no stock are purchased and bulls are also purchased.
homebred. However, this herd operates over several holdings with heifers being reared on a separate holding within the same ownership. The last breakdown in 2013 revealed genotype 25:a, but the last breakdown has disclosed genotype 17:a. Interestingly a neighbouring herd with no cattle contact and minimal purchase history has experienced the same change in genotype. Further towards Crewe along the same main road but approximately 3 miles away, genotype 17:a has also been isolated in three more cases. The homorange of 17a spans Mid and SW Cheshire but this raises the question of potentially infected wildlife with a genotype shift or a mixture of genotypes compared with previous breakdowns in the area. Wildlife monitoring in this area would be useful.

7. Wildlife

Badger populations are generally considered to have increased dramatically over the past 10 years. At the breakdown investigation (DRF) visits, it is not uncommon to hear of new setts being reported by the affected farmers when there were previously fewer setts historically. The general perception is that more badger road kills are seen in Cheshire and far fewer hedgehogs than previously. Fortunately, there are no feral pigs reported in Cheshire, but wild deer are very prominent in the area to the north of Congleton bordering on Staffordshire. Wild deer are easily visible in the Bosley area and it is thought that these can travel large distances over the hills to and from Staffordshire where there is endemic M. bovis infection. The deer are culled regularly for local consumption and to date, no-one has reported suspicion of TB in these carcasses except for one carcass found near the River Dane several years ago and found to have lesions consistent with TB. Further into Cheshire, there have been deer sightings, but these are much less common further south and west from Congleton.

The University of Liverpool pilot study of badgers found dead in Cheshire has revealed 12 M. bovis positive badgers submitted from approximately 102 carcasses since February 2014. A further six badgers are still potentially positive with definitive genotyping results still pending from last year.

8. Other Susceptible Species

Sudden deaths were reported in a number of alpacas in a small herd situated in Henbury near Macclesfield at the end of 2014. Initial post-mortem results revealed no abnormalities, but further post-mortem examinations revealed lesions suspicious of TB, which was then reported to APHA. Voluntary TB testing revealed a further seven skin reactors, with six alpacas having widespread lesions consistent with TB (five were open cases with lung abscesses). The second skin test is due in September 2015. Herd depopulation is under consideration although these alpacas are considered pets. As shown in figure 7 above, the herd is situated in an area close to several cattle herds infected with the same genotype 25:a. There is no evidence of cattle contact with these herds, although there is a strong suspicion of infected wildlife as despite interferon-gamma parallel testing and regular skin testing in the cattle, disease is ongoing in these herds.

9. Summary of Risks to the Low Risk Area (LRA) from the Edge Area and any Mitigating factors

The main risks to the LRA remain to the north east of the county towards the Stockport area in the north-east. Infected badgers have been identified in the Adlington area and the Morley area of Cheshire. As described above, a farmer-led, NFU-funded wildlife monitoring project is ongoing in the Stockport area for the remainder of this year.

The area further north towards Warrington appears to be less of a concern as the area is less densely populated with cattle and bTB incidents appear to have been caused by movements of infected cattle up here as it is mainly beef fattening units that have been affected. The Wirral is the other LRA at risk and although the cattle TB breakdowns are less common in this area, we have seen changes in this area in the past couple of years.

There are several large New Zealand style herds which operate over large areas of Cheshire and extend into Derbyshire, Staffordshire and Shropshire, all of which are currently TB breakdowns. In these types of systems cattle are moved regularly although pre-movement testing and breakdown testing is carried out as required. There is still potential for cattle to be missed or moved before testing especially where SOAs are still in place. There are also several businesses operating multiple farms under one CPH in Cheshire. There is also potential for moving cattle without TB testing them between the multiple premises as there will be no requirement to report movements. These holdings have been allowed to operate in this way as the holdings are all within 10 miles of each other and under the RPA rules, they should only be operating under one CPH. There is potential here for disease spread and propagation.

Links with neighbouring counties and different risk areas have been broken by BCMS, so this is now less of a risk of spreading bTB than it was as affected businesses now have to report movements and these can be monitored for pre-movement testing whereas previously this was difficult to monitor as the movements did not require notification.
Both Cheshire markets have many cattle sales and also operate red markets and exempt markets. There is potential for movement of cattle through these markets into the LRA.

10. Summary of the risks to the Edge Area from the High Risk Area (HRA) and any mitigating factors

- Unfortunately, except for the urbanisation to the north of the county, there are very few natural barriers between the HRAs of the neighbouring counties, south Cheshire and the Cheshire Edge. Cheshire is a very flat county with very sandy soils, making them an ideal habitat for badgers.

- The large dairy herds which move cattle around Cheshire and across borders into the HRAs.

- High risk dealer activities – some farmers are still driven by economics rather than risk of TB and would prefer to pay less for a replacement cow rather than buying a lower risk cow. Some dealers source cheaper cattle from endemic bTB areas. Habitual activities are difficult to change. The experience of the dispersal sale of a Cumbrian dairy herd last year has dissuaded many farmers from buying in from the LRA and many would prefer to buy a local animal which has recently been TB tested.

- On-farm biosecurity measures often not instigated due to costs – it is difficult to persuade farmers to spend money on fencing and badger proofing. More educational work needs to be done in this area.

- BCMS links – these have been broken between herds in the HRA, LRA and Edge Area.

11. Plans for the next half-year and future regarding Control Measures

- Continue with all Edge Area cattle control changes subject to cost-benefit analyses and review

- Continue collaboration with wildlife groups to identify and actively develop and to promote badger vaccination strategies in the Edge Area and particularly in west Cheshire

- Continue enhanced management of persistently infected herds as far as possible and seek financial support

- Continue to increase awareness of local farming community regarding bovine TB and its consequences through stakeholder events, farm visits and through the Cheshire Eradication Board.

- Review the HRA policy and buffer areas of the Edge and consider inclusion of the whole of the county of Cheshire in the Edge Area.

- Continue and increase local collaboration between stakeholders, wildlife groups (including rehabilitation centres), private vets and APHA colleagues locally and in neighbouring regions.

- Encourage more proactive action against inconclusive reactors either with private interferon-gamma testing, or in breakdown situations removal as direct contacts.

- Increased field epidemiological input into cases and review of issues with permanent veterinary resource

- Continue with auditing of skin tests performed by OVs

- Increase biosecurity advice for breakdown management and encourage contingency planning after the end of breakdowns.

Report compiled by

Lead TB VO Cheshire, APHA England North
Glossary

- **Edge Area (EA)** – the annual TB testing area of England situated between the High and Low Risk Areas

- **Epidemiology** – the science that studies the patterns, causes, and effects of health and disease conditions in defined populations

- **Genotype** – the genetic makeup of a cell, an organism, or an individual usually with reference to a specific characteristic under consideration

- **High Risk Area (HRA)** – the annual testing area of England comprising the South West, West Midlands and part of East Sussex, in which *M. bovis* infection is endemic in cattle herds and in badgers

- **Potential ‘Hotspots’** – a temporary area of enhanced TB cattle and wildlife surveillance that may be declared around some OTFW TB breakdowns of uncertain origin detected in a region of historically low TB incidence

- **Low Risk Area (LRA)** – the four-yearly TB testing area of the North and East of England in which *M. bovis* infection occurs only sporadically in cattle and is not considered endemic in wildlife. Although the default testing interval for routine TB surveillance is four years, some higher risk herds in the LRA are subjected to annual testing. There is also more intensive surveillance testing (radial testing) around any herds in the LRA (and parts of the Edge Area) that have their officially TB free status withdrawn due to a TB breakdown

- **OTF** – Officially Tuberculosis Free status. Herds that are not subjected to TB movement restrictions of any type are classified as OTF

- **OTF-S** – Officially Tuberculosis Free Suspended status. In England, an OTFS breakdown is a herd in which all the reactors removed had no visible lesions (NVL) on post-mortem examination and had negative culture results for *M. bovis*

- **OTF-W** – Officially Tuberculosis Free Withdrawn status. In England, an OTFW breakdown is a herd in which at least one test reactor with visible lesions (VL) and/or an animal with *M. bovis*-positive culture result have been disclosed

- **Persistent herd breakdown** – a herd that has been under TB movement restrictions for 18 months or longer due to infection with *Mycobacterium bovis*

- **bTB** – (bovine) Tuberculosis (infection of cattle with *Mycobacterium bovis*)

- **IFN-γ** – interferon-gamma test. A supplementary in vitro blood test for TB used by APHA in conjunction with the tuberculin skin test in some situations, usually to improve the overall diagnostic sensitivity in infected herds with OTF status withdrawn.

The Animal and Plant Health Agency is an Executive Agency of the Department for Environment, Food and Rural Affairs working to safeguard animal and plant health for the benefit of people, the environment and the economy.