Animal & Plant Health Agency

APHA Briefing Note 01/15

Defra launches new service to provide free TB management advice to cattle farmers within the badger cull areas of Somerset and Gloucestershire

Purpose

1. To inform Official Veterinarians (OVs) in England of a new service which will provide TB management advice to cattle farmers within the licensed badger cull areas of Somerset and Gloucestershire. This initiative will be of particular interest to OVs who have clients with cattle holdings within these areas.

Background

2. Defra has launched a new service to provide cattle keepers within the badger cull areas of England with free bespoke veterinary advice on TB management.

3. The service will be delivered by APHA over the next two years, as part of Defra's comprehensive strategy to beat the disease in England. It will help farmers to strengthen their TB prevention measures to the highest practical levels, complementing over measures in place within these areas of Somerset and Gloucestershire.

4. In January, APHA will send cattle keepers within these areas a summary of the local level of TB, with a description of known causes and risk factors. Copies of these documents are attached at Annexes A and B.

5. APHA will then provide keepers with tailored reports for each of their holdings, showing the number of incidents of TB recorded over the last five years, the cattle movement history and other risk-related information. Reports will be issued to keepers in batches over the two year period.

6. Keepers will also have the option of receiving a free farm visit from a vet, who will discuss the tailored report and provide bespoke advice and guidance on preventing TB.

7. To provide consistency of handling, five private veterinarians will cover the two areas and carry out the advisory visits over the two year period of the service.

The vets will be sourced from the existing Framework Agreement of appointed providers for veterinary services.

8. It is envisaged that the first batch of invitations to arrange a vet visit will be issued to cattle keepers within these areas of Somerset and Gloucestershire from February to March 2015.

9. Advice and guidance will include practical solutions aimed at preventing new breakdowns, reducing the risk of spread, possible changes in farm husbandry and suggested improvements to buildings or facilities. The vet will ensure awareness of other sources of information, support and guidance information and specialist advisory services. Feedback from the visit will be collated within APHA's Sam system for future reference.

For further information

- Defra news story: https://www.gov.uk/government/news/tb-advice-for-farmers-in-badger-cull-areas
- The strategy for achieving Officially Bovine Tuberculosis Free status for England: https://www.gov.uk/government/publications/a-strategy-for-achieving-officially-bovine-tuberculosis-free-status-for-england
- Annex A – Bovine TB in Somerset (page 3)
- Annex B – Bovine TB in Gloucestershire (page 11)

Issued: 14 January 2015

Annex A

Bovine TB in Somerset

This document is designed to provide information about bovine tuberculosis (bTB) in your local area and nationally, so that the subsequent farm level information we will send you can be put into context. We are sending two copies of this document so you can share with your vet or advisor.

Bovine TB in Somerset: occurrence and detection

Below is a map (**Figure 1**) showing the new TB incidents (or 'breakdowns) recorded in Somerset during 2013. A new TB incident can be generated by either the disclosure of a reactor at a skin test or a slaughterhouse case with a positive laboratory culture result. All incidents are classified as either Officially TB Free Status Suspended (OTFS; a case where none of the test reactors had visible lesions of TB at slaughter or positive culture results) or Officially TB Free Status Withdrawn (OTFW; positive culture or visible lesions found in at least one of the test reactors). **In the High TB Risk Area (HRA) counties of England, like Somerset, both types of incidents are likely to represent true infection in the herd, with the OTFS breakdowns likely to be more recent introductions, so we are depicting all breakdowns in the data below.**

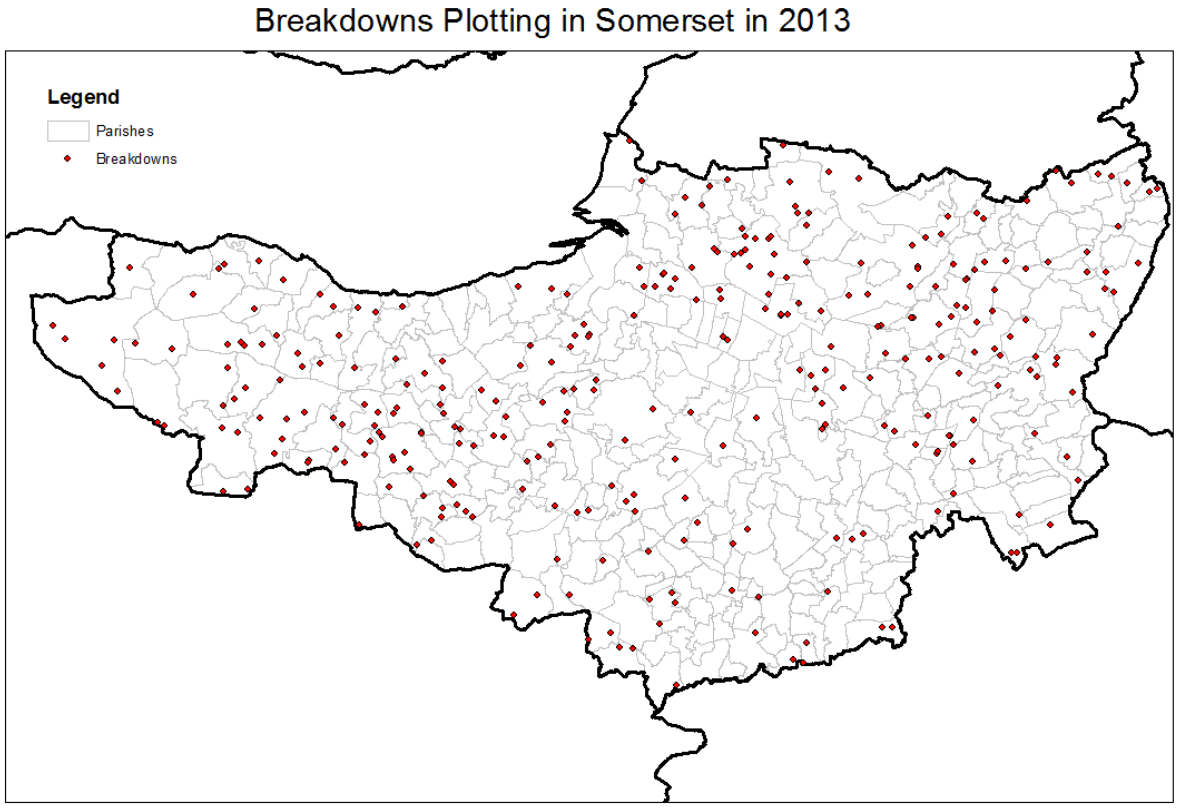

Figure 1. New TB incidents in Somerset in 2013 (the grey lines within the county are parish boundaries)

The bar chart (**Figure 2**) below shows the number of new TB incidents in Somerset over the past 5 years. These figures do not include on-going incidents that started in previous years, so are a reflection of the changes/trend in new incidents. In 2013, there was a total of 317 new bTB incidents in Somerset, 43 of which were disclosed by routine post-mortem inspection in abattoirs. It is clear that, **whilst there was a significant increase in bTB incidence from 2009 to 2010, there has been very little change in the numbers of new incidents in Somerset in the past four years.**

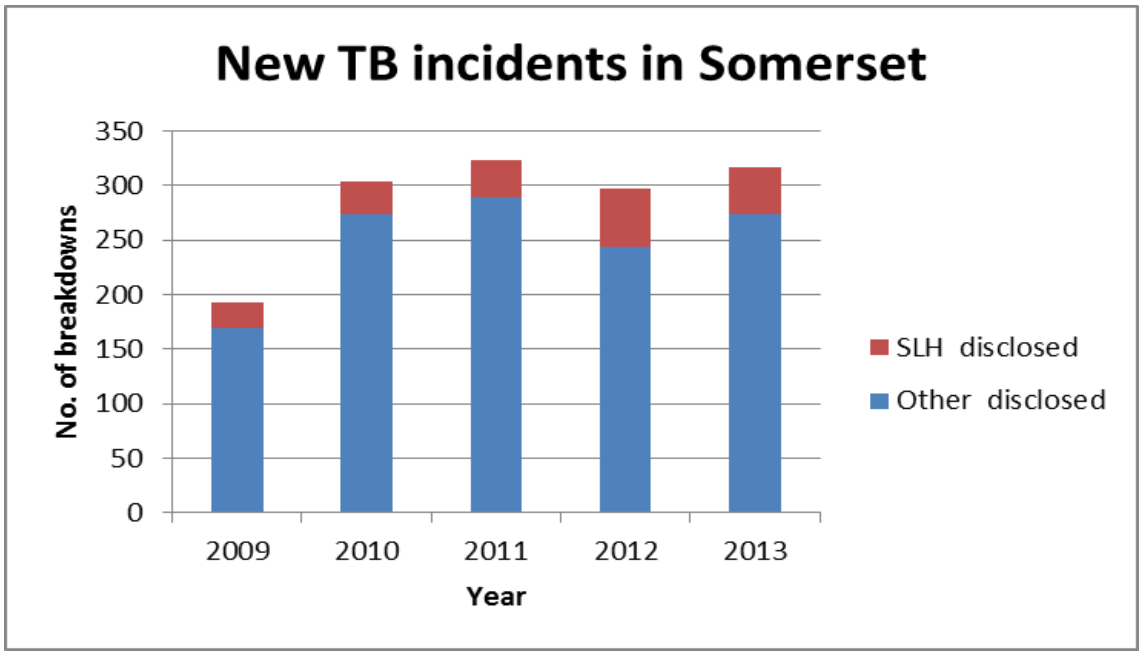

Figure 2. Number of new TB incidents in Somerset 2009-2013, divided into those disclosed by on-farm testing and by slaughterhouse surveillance.

Most of the new bTB incidents in Somerset are disclosed by skin testing (e.g. whole herd testing, trace testing or pre-movement testing). The number of incidents that have been disclosed by slaughterhouse surveillance (i.e. lesions are found in test negative animals at routine slaughter) in Somerset has ranged from 23-54 per annnum between 2009 and 2013; i.e. **less that 20% of new incidents are detected at slaughter. This figure is very similar in all HRA counties**, whilst in the Low TB Risk Areas of England, where surveillance testing of less frequent, between 40% and 55% of cases have been detected at slaughter every year.

The map below (**Figure 3**) shows the incidence rates (percentage of existing herds affected by a TB incident in 2013) by county across GB. As can be seen, **the breakdown incidence rate per 100 live herds per year for Somerset between 8% and 12%, which is slightly less than in the majority of the counties in the HRA of England.** All England HRA counties have herd incidence levels greater than8%. Across the HRA, between 8% and 16% of herds by county were affected by a new bTB incident in 2013.

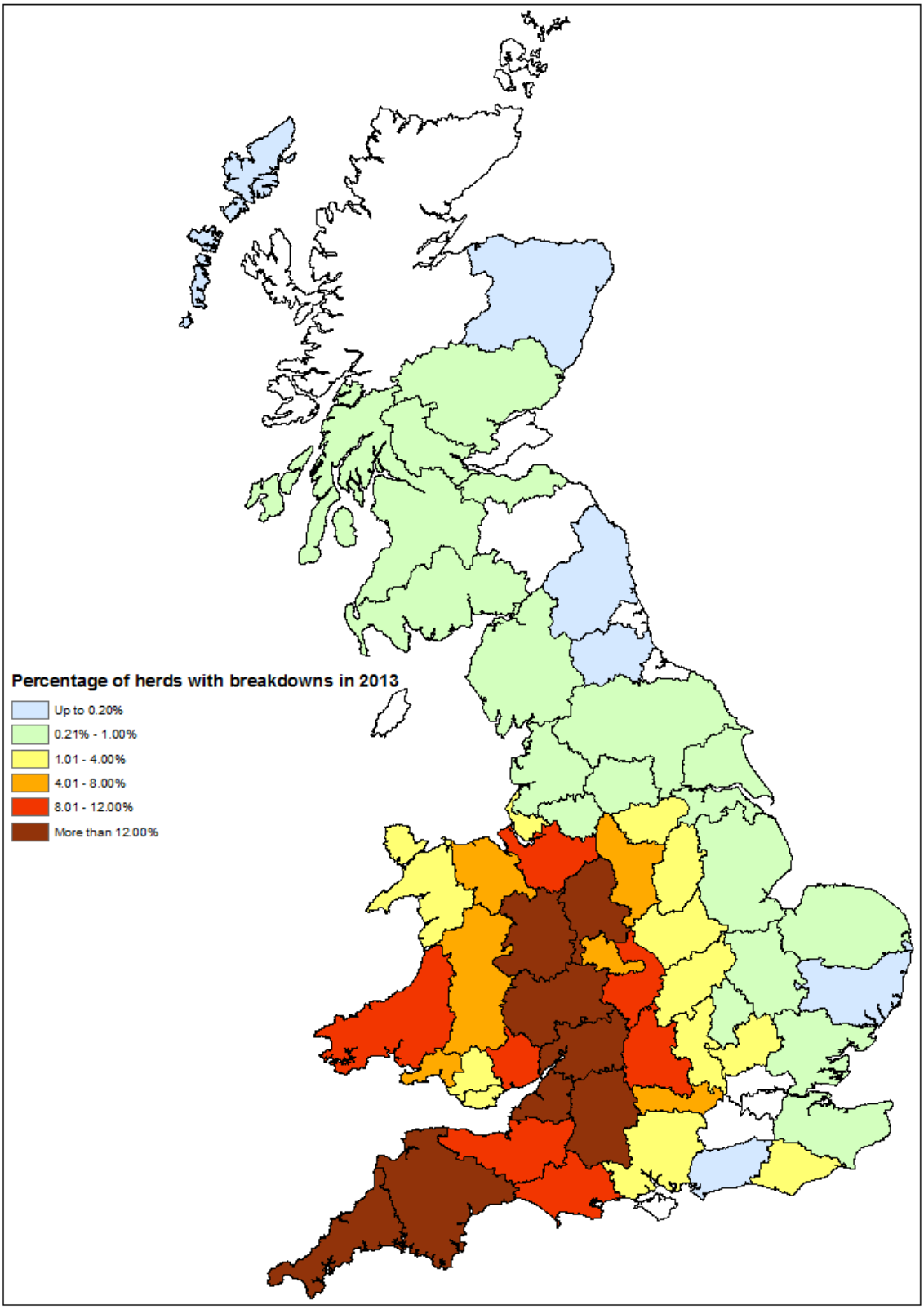

Figure 3. Percentage of herds affected by an OTFW breakdown in GB by county in 2013

Bovine TB in Somerset: duration of breakdowns

The majority of bTB breakdowns are resolved within 12 months, however some are not. These patterns could be due to an inability to remove all infected cattle from a herd during the breakdown testing or the continued transmission of disease into the herd from external sources (e.g. cattle movements in, contiguous contact with neighbouring cattle or badger-related transmission).

On average, breakdowns in the HRA of England last just under 200 days (i.e. from serving of the restriction notice until lifting of it). **Figure 4** demonstrates that the median duration of breakdowns in Somerset has varied from 156 to 203 days between 2009 and 2013 and mirror the median duration of breakdowns in the England HRA as a whole.

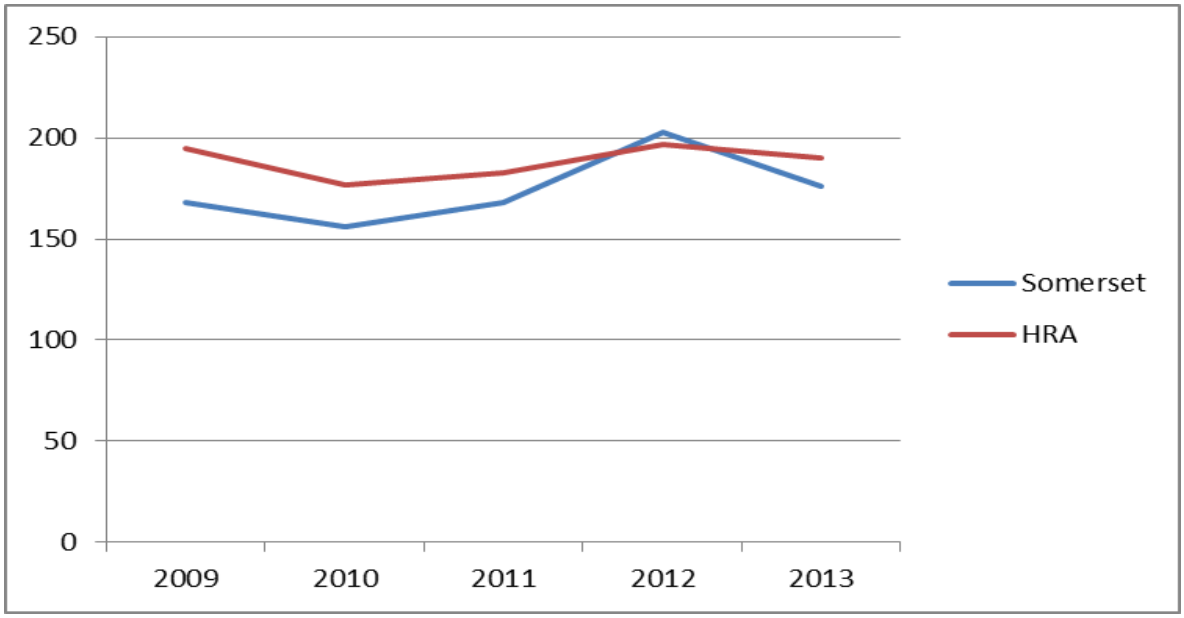

Figure 4. Median duration of bTB breakdowns in Somerset and in the England HRA in 2009-2013.

Breakdowns that last longer than 18 months (i.e. >550 days) are usually classified by APHA as persistent breakdowns. Breakdowns can last longer than average for various reasons. The tuberculin skin testing is not 100% accurate and is more likely to leave behind false negative animals than to take false positive animals, particularly in large herds containing more than a single infected animal. There can be a continuous re-infection of stock from badgers and from contact with neighbouring stock. Also, it has been demonstrated in Ireland that herds that are allowed to restock during the breakdown are more likely to experience a longer breakdown than herds that do not restock during the breakdown. In England, a number of persistent breakdowns before 2013 were found to have been caused by fraudulent practices, whereby test reactors were generated by tampering with the test site or had been kept in the herd by swapping ear tags.

On average around 8-10% of breakdowns in the HRA of England last longer than 18 months. This figure has, in recent years, been considerably lower (4-7%) in Somerset than in the HRA as a whole (**Figure 5**).

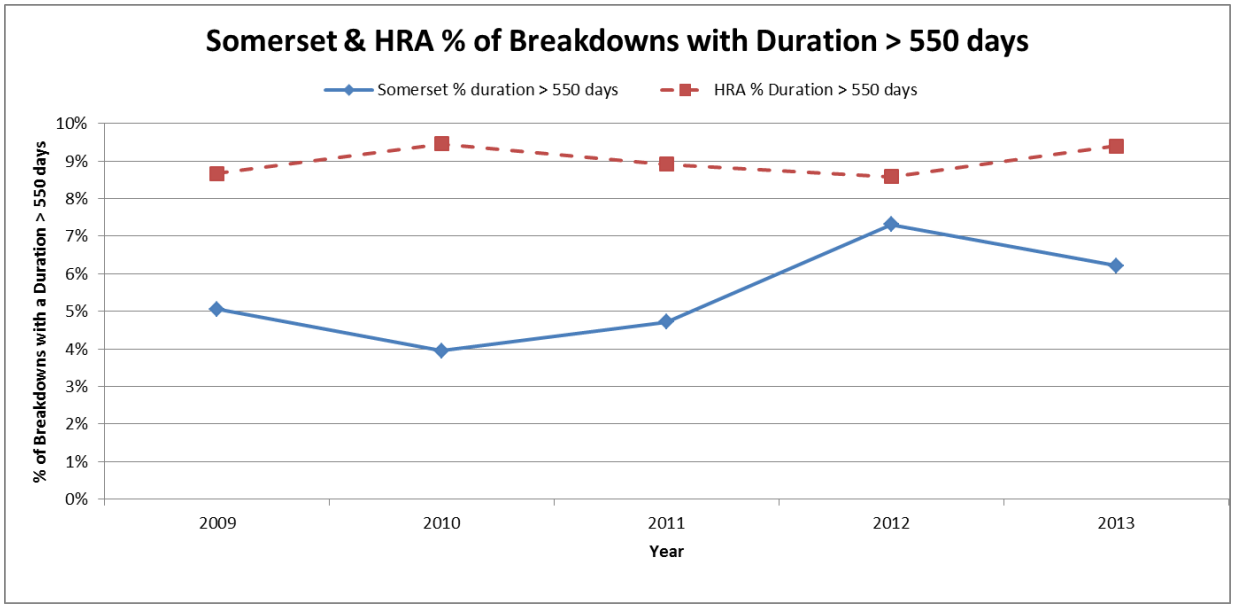

Figure 5. Percentage of breakdowns that last longer than 550 days in the England HRA and in Somerset in 2009-2013.

Bovine TB in Somerset: recurrence of breakdowns

One of the typical features of the bTB epidemic in the HRA of England is a high level of recurrence: the same farms keep on breaking down time and again, often shortly after the previous breakdown has ended.

Recurrent breakdowns occur for similar reasons as the persistent ones. We know that there is a risk of leaving infected animals in the herd after lifting the restrictions, as the skin test is not perfect and its ability to detect all the infected animals in a herd depends very much on following a meticulous testing technique on the farm. Scientific analysis suggests that infected animals remain in herds after lifting the restrictions in more than 20% of all breakdowns. Reinfection by badgers and by contact with neighbouring, infected stock and purchase of infected stock (often to replace the animals lost as reactors) all contribute to the high recurrence levels in the HRA.

Figure 6 shows that the recurrence rate in recent years in Somerset has varied from 35% to 55% and remains below the England HRA average. The recurrence in Somerset has, however, been increasing rapidly in the past three years since 2010 and is now approaching the HRA average.

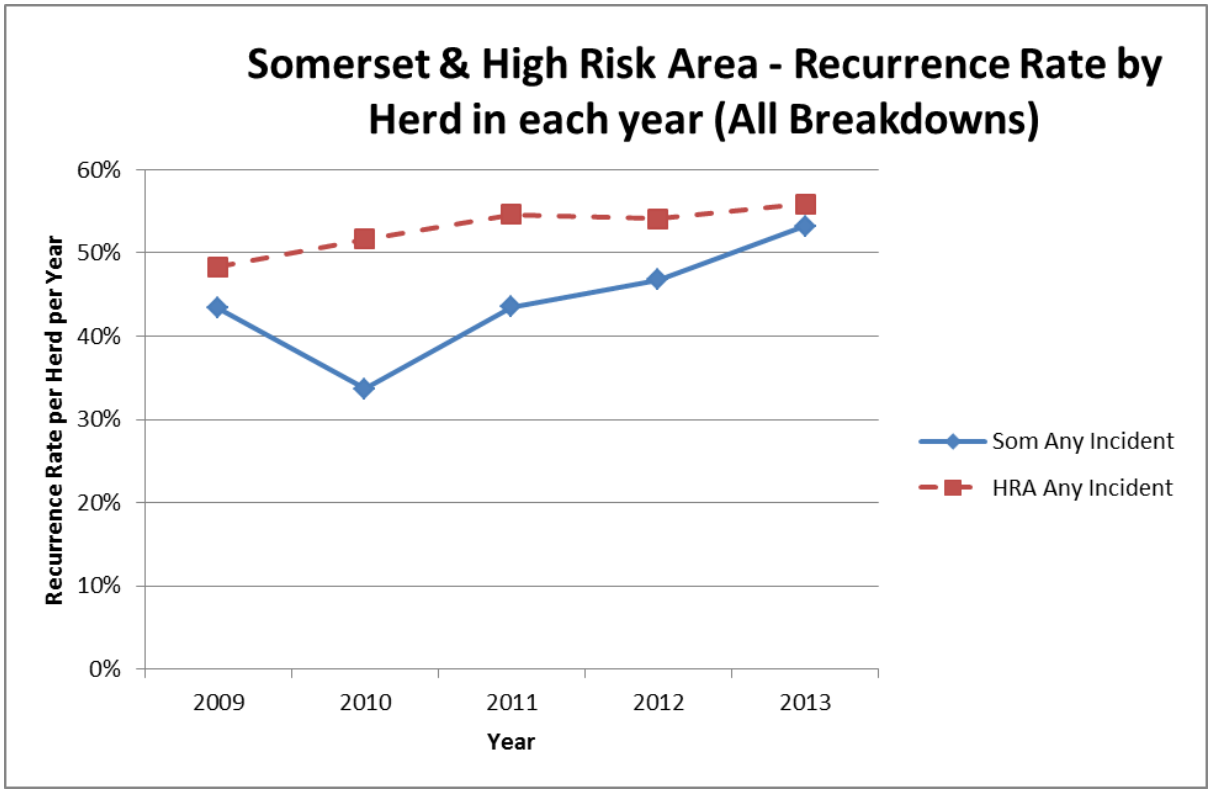

Figure 6. Proportion of breakdown holdings that have had a bTB breakdown in 2009-2013 and have had one or more bTB breakdowns in the previous three years in Somerset and in the HRA of England.

Bovine TB in Somerset: numbers of TB reactors removed from breakdown herds

One of the main impacts of a TB breakdown at farm level is the number of reactor animals removed. Sometimes this can have a major impact on the farm business and, as suggested above, can lead to persistence and recurrence as replacement stock has to be bought in.

In 2012 and 2013, **the average number of reactors (this includes the twice inconclusive reactor (IR) animals) removed from breakdowns in Somerset was 6.4 and 5.4 animals. The corresponding figures for the HRA of England in 2012 and 2013 were 7 and 7.1 animals.**

Average figures can, however, be misleading as approximately 20% of TB breakdowns lose only one animal as a reactor or a twice IR while the remaining 80% of breakdowns holdings may suffer much higher losses in terms of animals removed.

Mycobacterium bovis (*M. bovis*) spoligotype distribution in GB and in Somerset

M. bovis (the bacterium that causes bovine TB) can be separated into different strains. If these different strains (or 'spoligotypes') are plotted on a map, they show a pattern of geographical clustering. A map of the spoligotypes identified during 2013 in GB is shown below (**Figure 7**). Only positive laboratory culture samples of *M. bovis* can be typed, and normally only one sample is typed in a single TB incident even if there are many reactors with visible lesions at slaughter removed.

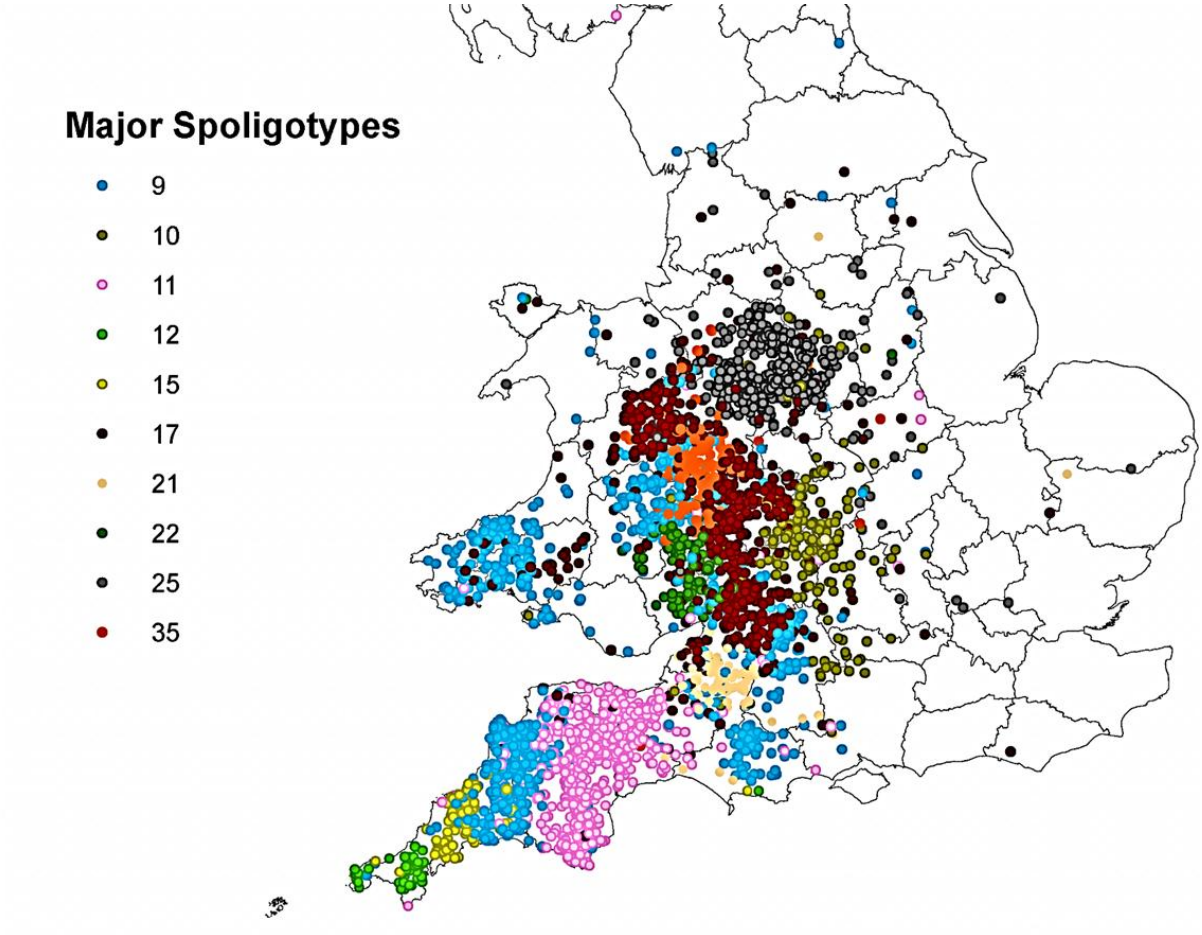

Figure 7. A map of *M. bovis* spoligotype distribution across England and Wales in 2013.

We can use spoligotype information to help us understand the spread of disease. As can be seen in the map, most isolates lie within their expected cluster (or homerange**). Those that lie outside their expected cluster are often associated with movements of infected cattle. Most TB incidents in Somerset are caused by spoligotype 11 (central and western parts) and by spoligotypes 17 and 21 (eastern parts of the county), and are probably caused by local cattle movement or contiguous transmission or by contact with local badgers that are likely to be infected with the same spoligotype as cattle in their homeranges.** Spoligotypes can be further broken down to genotypes which also have their homeranges (areas where they are more likely to be found). **Figure 8** depicts the genotypes of the isolates identified in laboratory culture-positive breakdowns in Somerset in 2013. The isolates that are out of their homeranges are shown as square dots on the map.

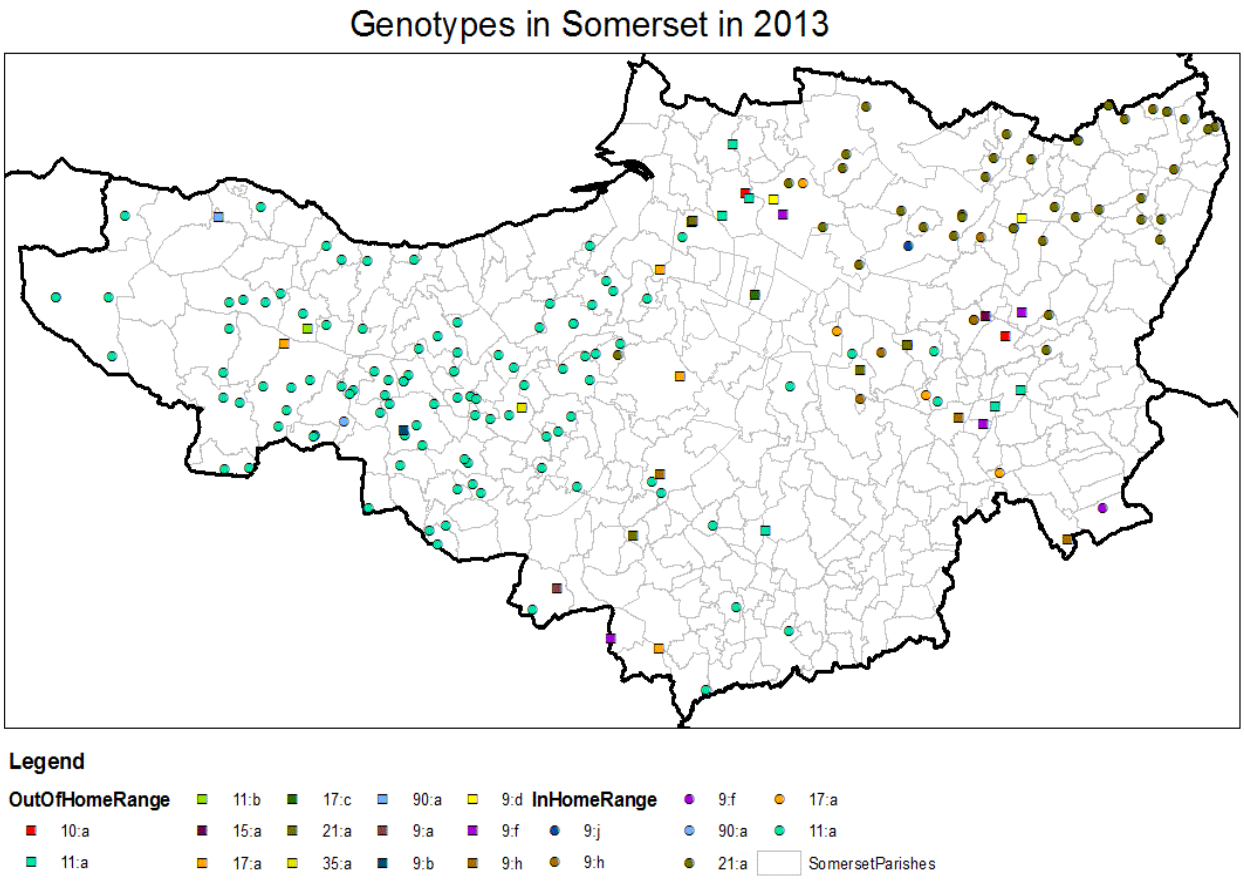

Figure 8. Genotypes isolated from bTB breakdowns in Somerset in 2013. Genotypes that are out of homerange are shown as square dots on the map. (Please note that this map differs from the map in Figure 1 as in this map only the laboratory culture-positive breakdowns are depicted.)

Annex B

Bovine TB in Gloucestershire

This document is designed to provide information about bovine tuberculosis (TB) in your local area and nationally, so that the subsequent farm level information we will send you can be put into context. We are sending two copies of this document so you can share with your vet or advisor.

Bovine TB in Gloucestershire: occurrence and detection

Below is a map (**Figure 1**) showing the new TB incidents (or 'breakdowns') recorded in Gloucestershire during 2013. A new TB incident can be generated by either the disclosure of a reactor at a skin test or a slaughterhouse case with a positive laboratory culture result. All incidents are classified as either Officially TB Free Status Suspended (OTFS; a case where none of the test reactors had visible lesions of TB at slaughter or positive culture results), or Officially TB Free Status Withdrawn (OTFW; positive culture or visible lesions found in at least one of the test reactors). **In High TB Risk Area (HRA) counties of England, like Gloucestershire, both types of incident are likely to represent true infection in the herd, with the OTFS breakdowns likely to be more recent introductions, so we are depicting all breakdowns in the data below.**

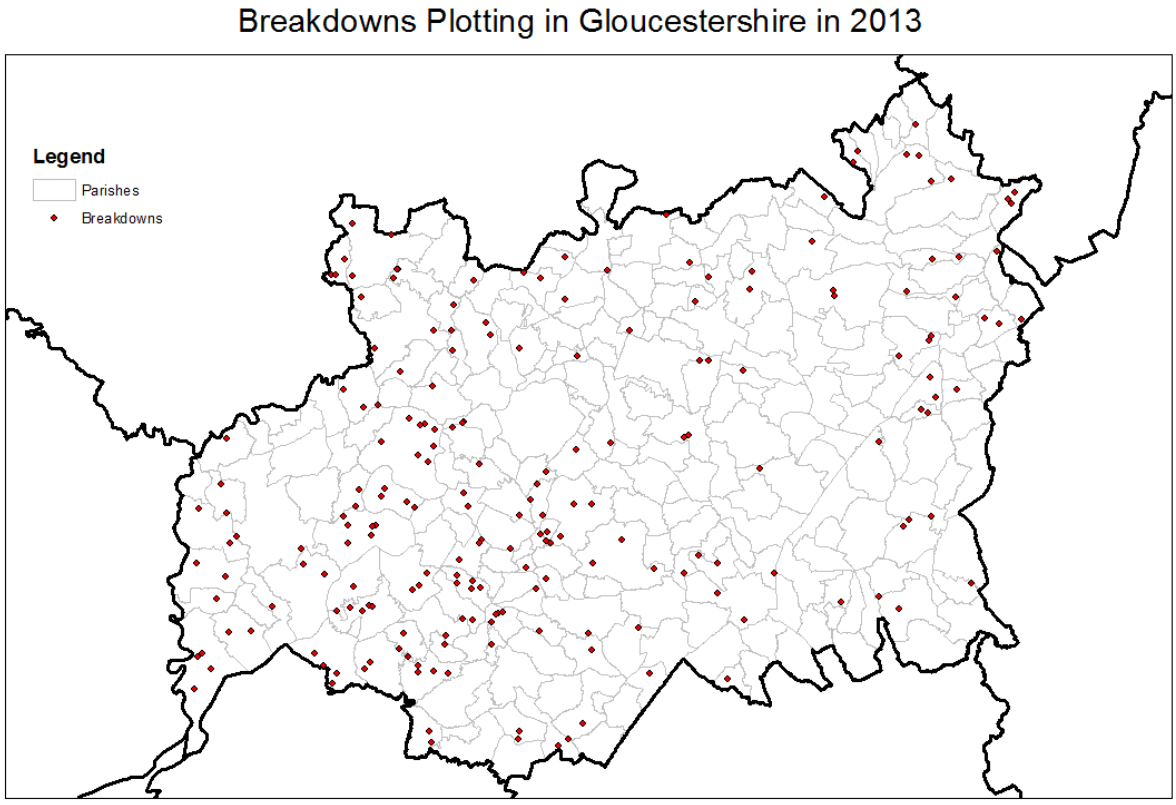

Figure 1. New TB incidents in Gloucestershire in 2013 (the grey lines within the county are parish boundaries)

The bar chart (**Figure 2**) below shows the number of new TB incidents in Gloucestershire over the past 5 years. These figures do not include on-going incidents that started in previous years, so are a reflection of the changes/trend in new incidents. In 2013, there was a total of 209 new bTB incidents in Gloucestershire, 37 of which were disclosed by routine post-mortem meat inspection in abattoirs. It is clear that, **whilst the new incidence level remains high in comparison to other HRA counties of England, there has been very little change in the numbers of new incidents in Gloucestershire in the past five years.**

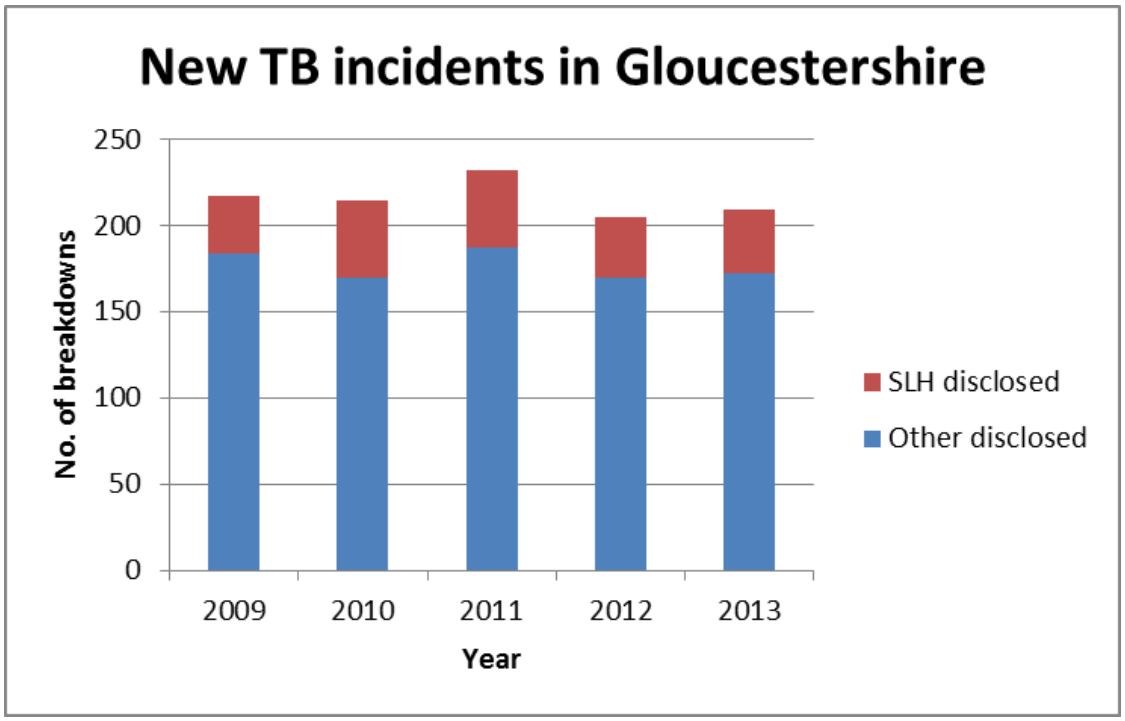

Figure 2. Number of new TB incidents in Gloucestershire 2009-2013, divided into those disclosed by on-farm testing and by slaughterhouse surveillance.

Most (around 80%) of the new bTB incidents in Gloucestershire are disclosed by skin testing (e.g. whole herd testing, trace testing or pre-movement testing). The number of incidents that have been disclosed by slaughterhouse surveillance (i.e. lesions are found in test negative animals at routine slaughter) in Gloucestershire has ranged from 33-45 per annum between 2009 and 2013; i.e. **around 20% of new incidents are detected at slaughter. This figure is very similar in all HRA counties**, whilst in the Low TB Risk Area of England, where surveillance testing is less frequent, between 40% and 55% of cases have been detected at slaughter every year.

The map below (**Figure 3**) shows the incidence rates (percentage of existing herds affected by a TB incident in 2013) by county across GB. As can be seen, **the breakdown incidence rate per 100 live herds per year for Gloucestershire was greater than 12% in 2013.** All HRA counties of England have herd incidence levels of greater than 8%; across the HRA between 8% and 16% of herds by county were affected by a new bTB incident in 2013.

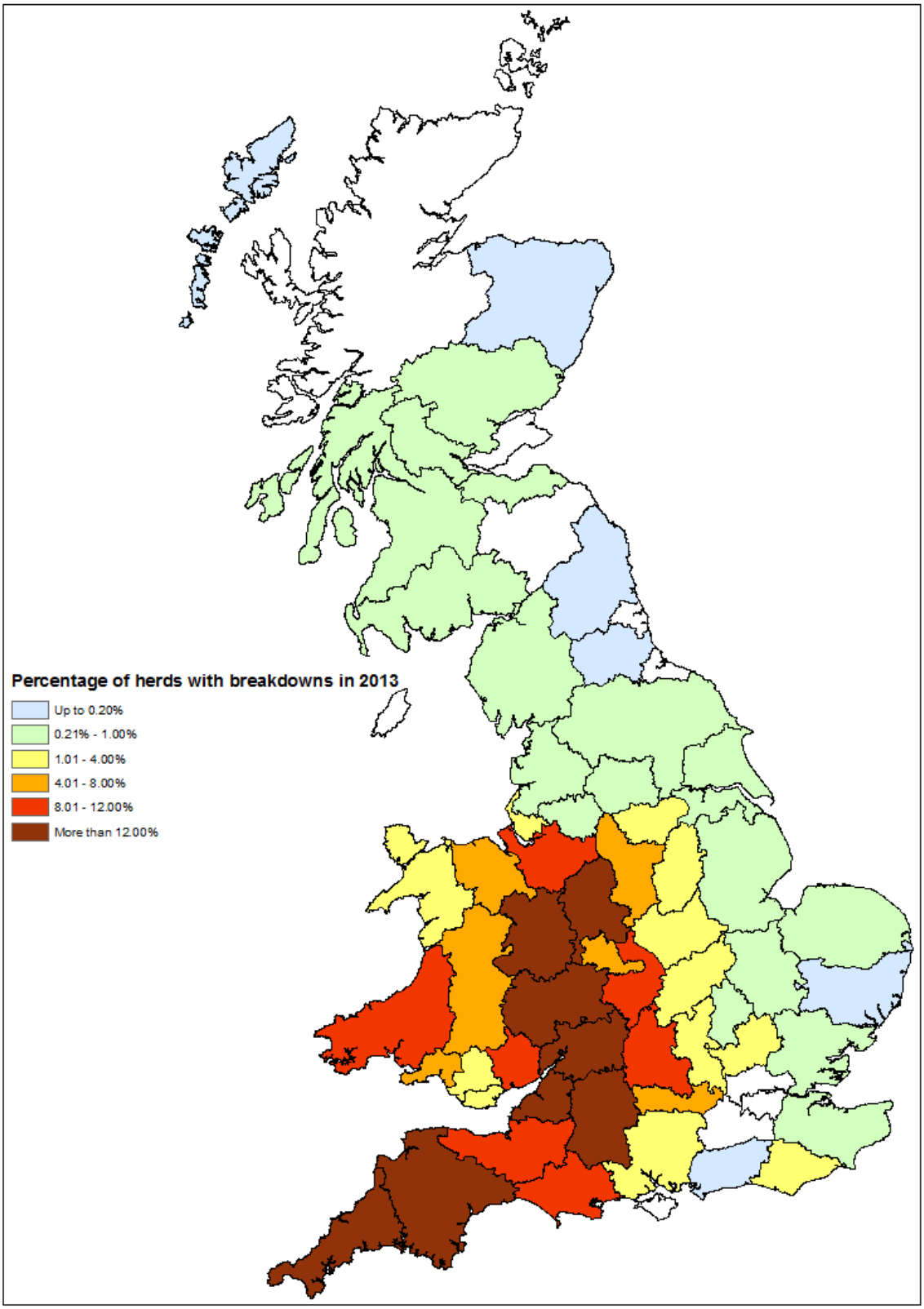

Figure 3. Percentage of herds affected by a new TB breakdown in GB by county in 2013

Bovine TB in Gloucestershire: duration of breakdowns

The majority of bTB breakdowns are resolved within 12 months, however some are not. These patterns could be due to an inability to remove all infected cattle from a herd during the breakdown testing or the continued transmission of disease into the herd from external sources (e.g. cattle movements in, contiguous contact with neighbouring cattle or badger-related transmission).

On average, breakdowns in the HRA of England last around 200 days (i.e. from serving of the restriction notice until lifting of it). **Figure 4** demonstrates that the median duration of breakdowns in Gloucestershire has varied from 200 to 213 days between 2009 and 2013 and is slightly higher than on average in the HRA of England.

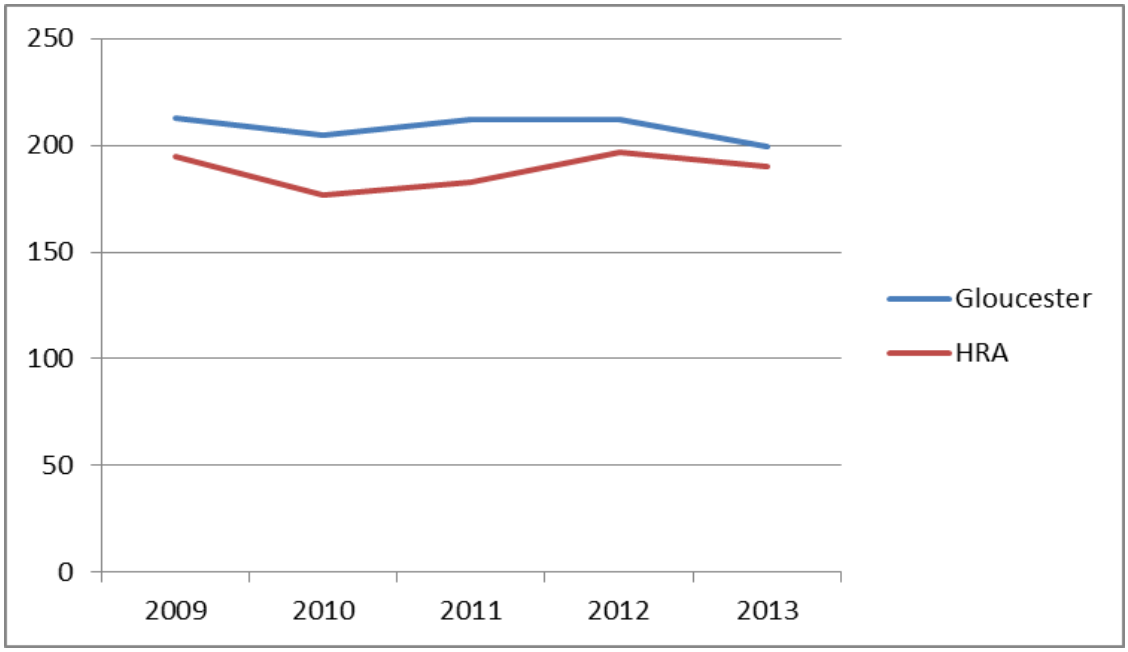

Figure 4. Median duration of TB breakdowns in Gloucestershire and in the England HRA in 2009-2013.

Breakdowns that last longer than 18 months (i.e. >550 days) are usually classified by APHA as persistent breakdowns. Breakdowns can last longer than average for various reasons. The tuberculin skin testing is not 100% accurate and is more likely to leave behind false negative animals than to take false positive animals, particularly in large herds containing more than a single infected animal. There can be a continuous re-infection of stock from badgers and from contact with neighbouring stock. Also, it has been demonstrated in Ireland that herds that are allowed to restock during the breakdown are more likely to experience a longer breakdown than herds that do not restock during the breakdown. In England, a number of persistent breakdowns before 2013 were found to have been caused by fraudulent practices, whereby test reactors were generated by tampering with the test site or had been kept in the herd by swapping ear tags.

On average around 8-10% of breakdowns in the HRA of England last longer than 18 months. This figure has, in recent years, been slightly higher (range: 13-15%) in Gloucestershire than in the HRA as a whole (**Figure 5**).

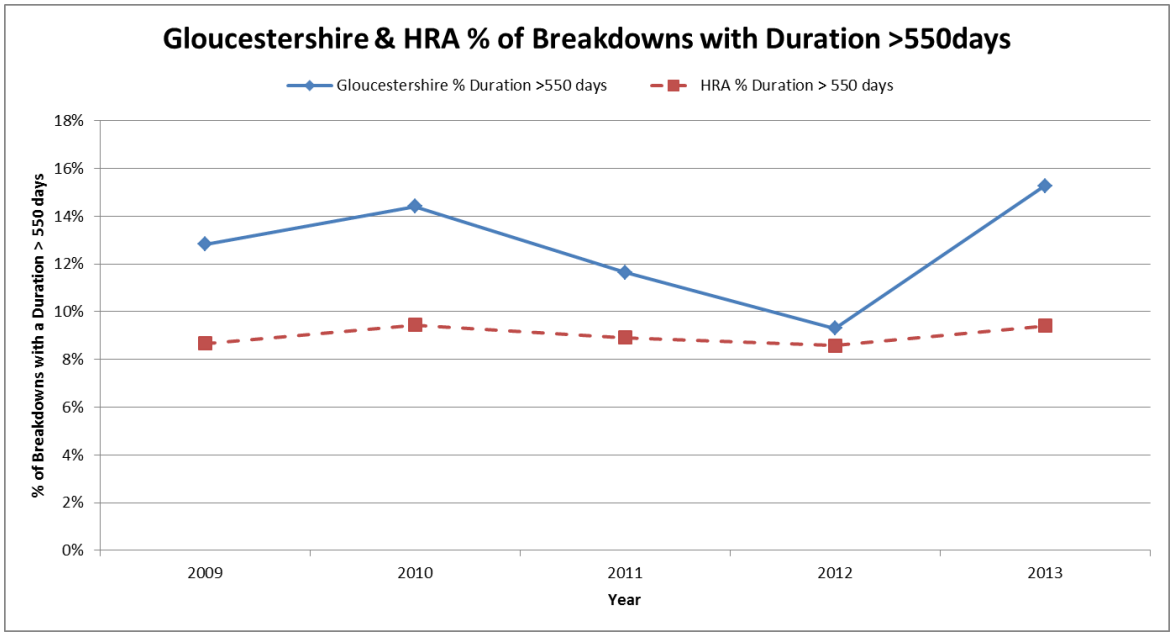

Figure 5. Percentage of breakdowns that last longer than 550 days in the HRA of England and in Gloucestershire in 2009-2013.

Bovine TB in Gloucestershire: recurrence of breakdowns

One of the typical features of the TB epidemic in the HRA of England is a high level of recurrence: the same farms keep on breaking down time and again, often shortly after the previous breakdown has ended.

Recurrent breakdowns occur for similar reasons as the persistent ones. We know that there is a risk of leaving infected animals in a herd after lifting the restrictions, as the skin test is not perfect and its ability to detect all the infected animals in a herd depends very much on following a meticulous testing technique on the farm. Scientific analysis suggests that infected animals remain in herds after lifting the restrictions in more than 20% of all breakdowns. Reinfection by badgers and by contact with neighbouring, infected stock and purchase of infected stock (often to replace the animals lost as reactors) all contribute to the high recurrence levels in the HRA.

Figure 6 shows that around 60% of holdings that have a TB breakdown in Gloucestershire in each year have had one or more TB breakdowns in the previous three years. This figure, again, is slightly higher than the corresponding figure for the HRA of England as a whole.

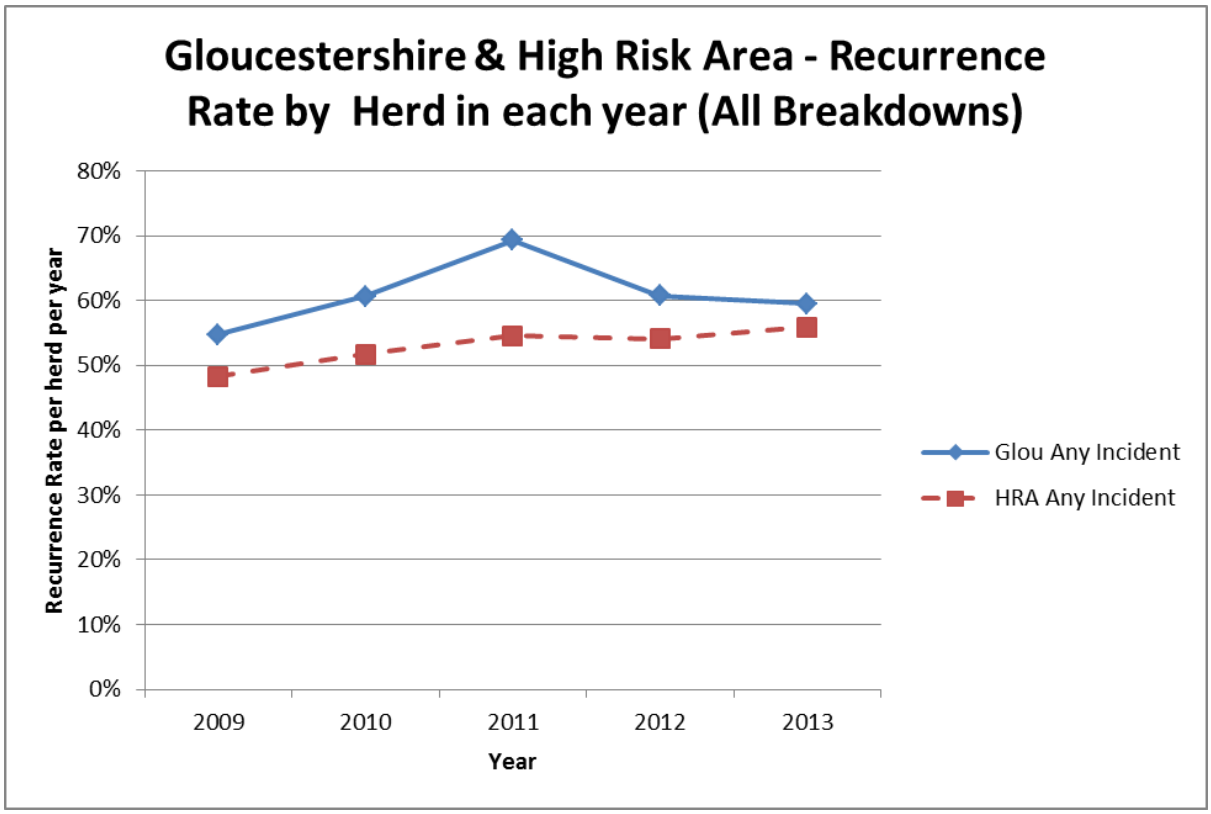

Figure 6. Proportion of breakdown holdings that have had a TB breakdown in 2009-2013 and have had one or more TB breakdowns in the previous three years in Gloucestershire and in the HRA of England .

Bovine TB in Gloucestershire: numbers of TB reactors removed from breakdown herds

One of the main impacts of a TB breakdown at farm level is the number of reactor animals removed. Sometimes this can have a major impact on the farm business and, as suggested above, can lead to persistence and recurrence as replacement stock has to be bought in.

In 2012 and 2013**, the average number of reactors (including the twice inconclusive reactor (IR) animals) removed from breakdowns in Gloucestershire was 6.7 and 8.5 animals, respectively. The corresponding figures for the HRA of England in 2012 and 2013 were 7 and 7.1 animals.**

Average figures can, however, be misleading as approximately 20% of TB breakdowns lose only one animal as a reactor (or a twice IR) while the remaining 80% may suffer much higher losses in terms of animals removed.

Mycobacterium bovis (*M. bovis*) spoligotype distribution in GB and in Gloucestershire

M. bovis (the bacterium that causes bovine TB) can be separated into different strains. If these different strains (or 'spoligotypes') are plotted on a map, they show a pattern of geographical clustering. A map of the spoligotypes identified during 2013 in GB is shown below (**Figure 7**). Only positive laboratory culture samples of *M. bovis* can be typed, and normally only one sample is typed in a single TB incident even if there are many reactors with visible lesions at slaughter.

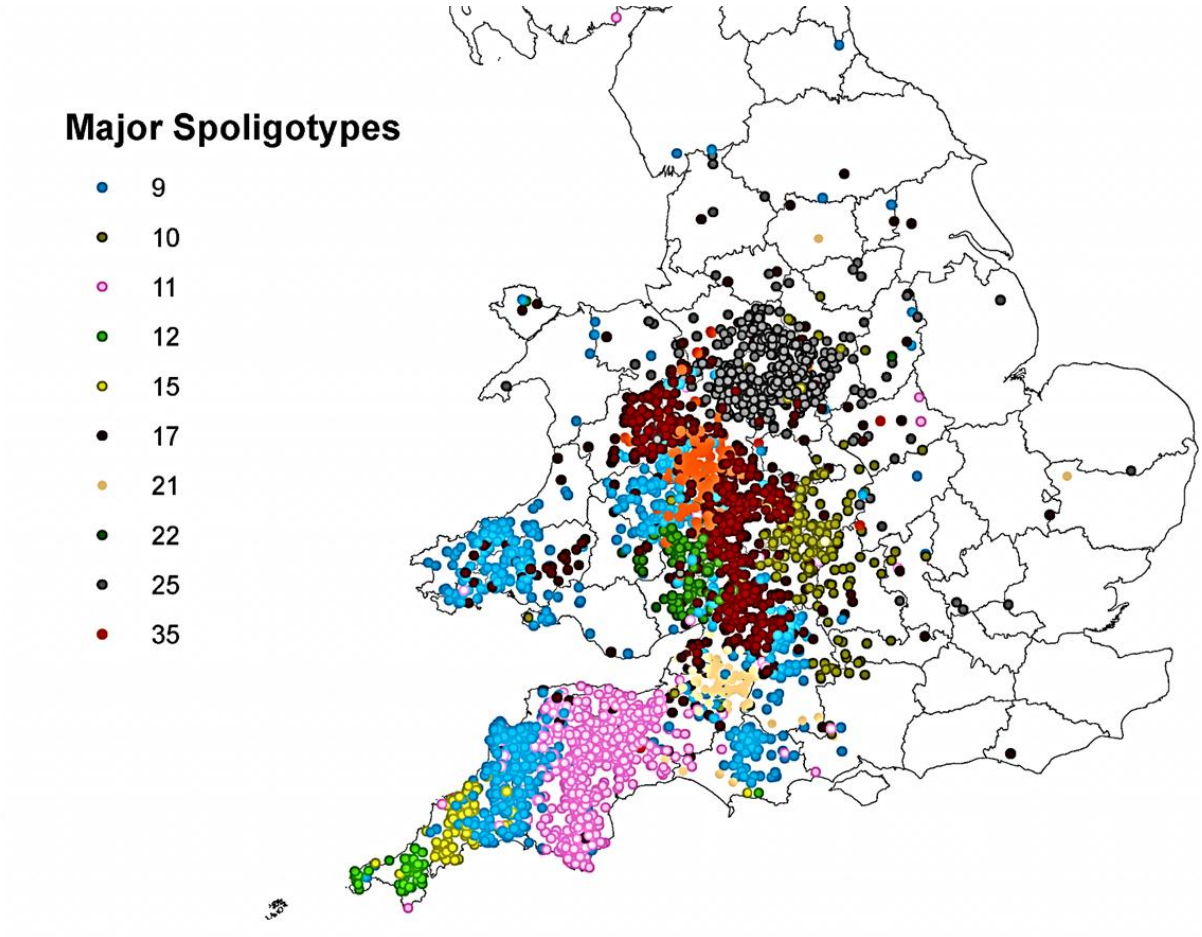

Figure 7. A map of *M. bovis* spoligotype distribution across England and Wales in 2013.

We can use spoligotype information to help us understand the spread of disease. As can be seen in the map, most isolates lie within their expected cluster (or home-range). **Those that lie outside their expected cluster are often associated with movements of infected cattle. Most TB incidents in Gloucestershire are caused by spoligotype 25 and 9 (central and western parts) and by spoligotype 10 (eastern parts of the county), and are probably caused by local cattle movement or contiguous transmission or by contact with local badgers that are likely to be infected with the same spoligotype as cattle in their**

homeranges. Spoligotypes can be further broken down to genotypes which also have their homeranges (areas where they are more likely to be found). **Figure 8** depicts the genotypes of the isolates identified in laboratory culture-positive breakdowns in Gloucestershire in 2013. The isolates that are out of their homeranges are shown as square dots on the map.

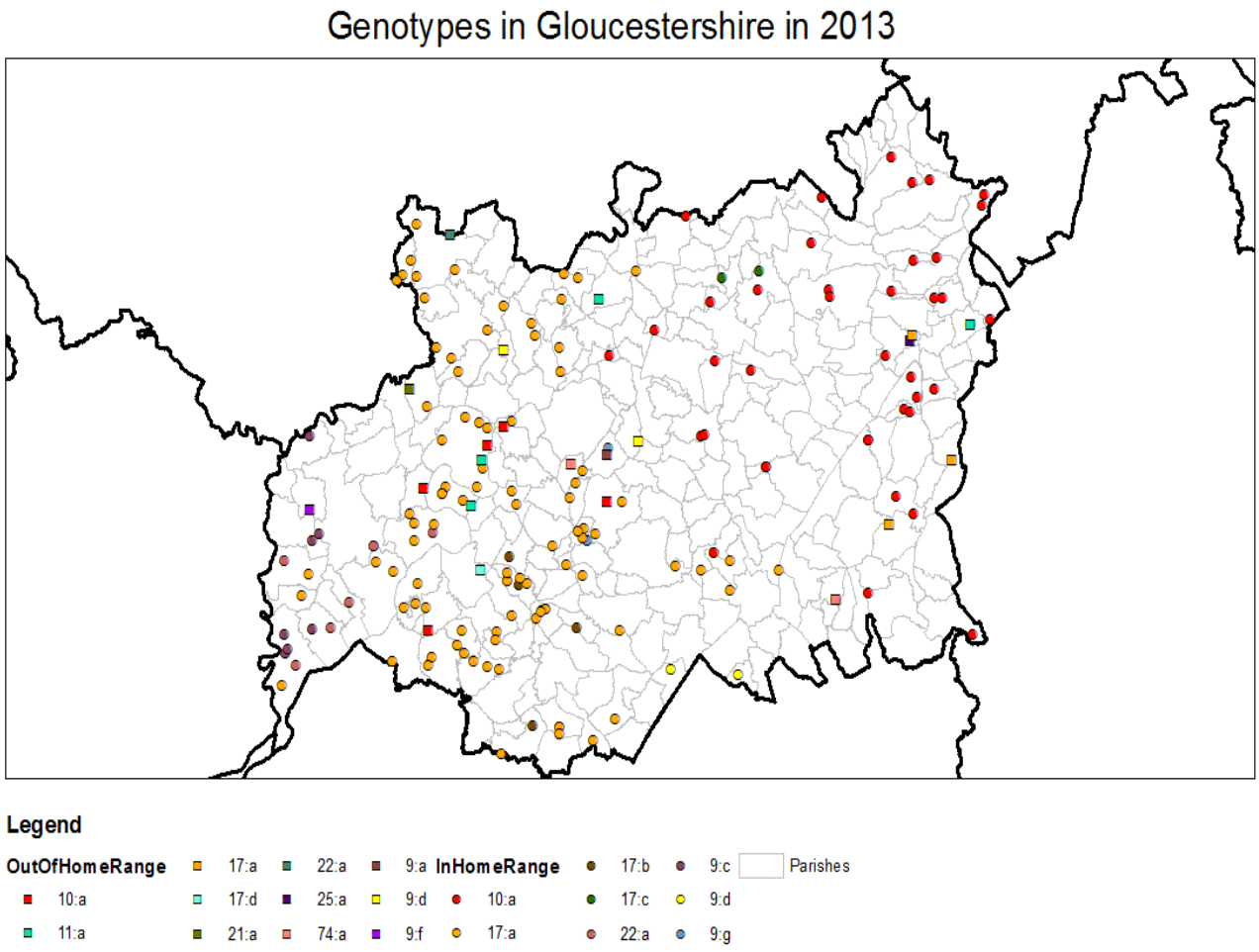

Figure 8. Genotypes isolated from TB breakdowns in Gloucestershire in 2013. Genotypes that are out of home-range are shown as square dots on the map. (Please note that this map differs from the map in Figure 1 as in this map only the laboratory culture-positive breakdowns are depicted.)