TB is increasing.
Let's make the North West
TB free.

NORTH WEST TB COHORT AUDIT

2014 REPORT

Contents

Executive Summary

- TB Cohort Audit was established across the North West in April 2012. This report summarises the first two years results.
- North West TB Cohort Audit operates quarterly across four geographical footprints: Cheshire and Merseyside, Cumbria and Lancashire, North Manchester and South Manchester.
- All 1515 cases of TB notified from the North West during this time period were audited.
- We have established that cohort audit is feasible across this wide geographical area encompassing both low and high TB prevalence communities.
- The overall standard of TB case management in the North West has been found to be excellent as judged against the 9 agreed outcome measures.
- Where baseline outcome compliance was good (e.g. standard risk assessment, treatment completion) this was maintained or improved.
- Where baseline compliance was less good (e.g. in offer of HIV testing, timely ETS data entry) this improved with time.
- Baseline differences in compliance with outcome measures between footprints were observed. These improved with time.
- North West TB Cohort Audit has identified multiple learning points that can be used to enhance TB care.
- The multidisciplinary regional approach to TB cohort audit has promoted local and regional team working, exchange of good practices and local initiatives to improve care.
- A qualitative evaluation of North West TB Cohort Audit has been completed and will be reported separately.

Foreword

This report is a comprehensive review of the 1,515 cases tuberculosis notified during the first 2 years of North West TB Cohort Audit.

Significant numbers of TB cases occur in the North West and since 2011 partners across the locality have been working together, through the TB Summit to address this. The joint expertise being harnessed through cohort audit is vitally important in supporting high and low incidence areas to maintaining expertise in TB management. We believe the large geographic footprint covered by the North West Cohort Audit is unique in the UK. We hope that you will agree, on reading this report, that it has been successful.

TB cohort audit can only occur with effective multidisciplinary teamwork. Particular thanks must go to the TB Nurses who along with the North West TB Cohort Coordinator put considerable time and effort into preparing for the audits as well as the Cohort Chairs who are pivotal in ensuring the audit is a success. Despite, or maybe because of, the significant re-organisation of the healthcare landscape in 2013, attendance at TB Cohort Audit continues to increase.

A qualitative review was commissioned by the Cohort Audit Steering Group in 2013 to look specifically at the impact cohort audit has on practice and treatment of TB in the North West. Initial results indicate a very strong joint ownership of cohort audit from both TB clinicians, TB Nurses and Public Health. A full report on this research will be published in 2014.

TB Cohort Audit is about more than just reviewing the clinical management of patients and being NICE compliant. It's about education, support and maintaining a strong network of dedicated TB Professionals across many disciplines.

Mark Woodhead BSc DM FRCP FERS
Chair North West TB Cohort Audit Steering Committee
Honorary Clinical Professor of Respiratory Medicine, Manchester Royal Infirmary

Methodology

Introduction of Cohort Audit in the North West

The North West covers a population of around seven million people and includes 23 Local Authorities, 5 NHS England Area Teams, 33 CCGs and 3 Public Health England Centres. In 2012 there were a total of 794 cases reported in the North West (incidence rate of 11.2 per 100,000).[1]

TB cohort reviews (or 'audits') were introduced to the UK in London in 2010, and a pilot was implemented in the North West in November 2011. Following successful evaluation of the pilot the North West TB Cohort Audit was rolled out fully in April 2012

North West TB Cohort Audit is overseen by a Steering Group comprising of representatives from clinical medicine, nursing and public health. It is one of a number of workstreams of the North West TB Summit. More information on the background of cohort audit and the North West TB Summit can be found here: http://tbsummit.wordpress.com/

Aims and objectives

To improve the management of cases and their contacts, thereby strengthening the prevention and control of TB.

TB cohort audit is a collaboration between TB nurses, TB physicians, epidemiologists, public health specialists and analysts, to collate and review clinical, epidemiological and service-related information with the aim of improving clinical and public health outcomes and identifying systematic issues relating to workforce, education and training, or quality of care.

The objectives are:

1. To ensure the implementation of comprehensive case management procedures for all TB patients
2. To improve the promptness of appropriate interventions
3. To enhance the reliability of data on the National Enhanced TB Surveillance System and local TB Registers
4. To provide immediate analysis of treatment outcomes and contact investigation efforts, measured against previous cohorts
5. To assess efforts compared to local and national TB control targets
6. To identify, track and follow up on important case management issues
7. To provide on-going training and education for staff
8. To provide staff with a forum for open discussion

[1] **Health Protection Agency.** Tuberculosis in the UK: Annual report on tuberculosis surveillance in the UK, 2012. London : s.n., 2012.

Logistics and Methodology

The North West is divided up into four footprints in order to manage the case numbers effectively at the audit meetings. The four footprints are;

- Cheshire and Merseyside
- Cumbria and Lancashire
- North Manchester
- South Manchester

Each footprint has 4 audit meetings (or 'Rounds') per year at which TB Specialist Nurses present the cases they managed over a 3 month period. For each case they cover the key clinical aspects, the contact tracing results, the treatment outcomes and highlight any successes or challenges they encountered. A public health analyst provides immediate feedback on the 9 audit outcomes for the cases presented at the end of the meeting.

Cases for review are identified from the Public Health England Enhanced TB Surveillance (ETS) database. Each Round considers patients who commenced TB treatment over a 3 month period, six months before the audit. This is so that most patients will be at or nearing the end of a standard course of TB treatment at the time of the audit. So, for example, this means that 'Round 1' which took place in July 2012 covered cases reported on to ETS in Quarter 3 (October to December) of 2011 (see appendix 3 for more details).

A Cohort Coordinator is employed to oversee the process, identify the cohorts, and manage the Cohort Audit sessions. The audits are chaired by experienced TB clinicians (see appendix 4), who encourage constructive discussion, identify learning or service improvement opportunities, and summarise the key learning from each audit. This role is key in maximising the impact of cohort audit.

More information on the logistics of cohort audit and the North West TB Summit can be found here: http://tbsummit.wordpress.com/

Data Analysis

Data analysis for this project is managed by the cohort coordinator working closely with Public Health England (PHE) epidemiologists. Public Health England manage the Enhanced TB Surveillance system (ETS) used by clinical TB staff to notify the disease onto a centralised data base. It is from this data base that case lists and data collection forms are derived. The most recent version of the data collection form can be seen in appendix 5. Initial feedback on the 9 outcomes is given at the end of each footprint meeting from the Public Health Analyst.

Attendance at Cohort Audit

Any healthcare professional for whom the management of TB is part of their job is encouraged to attend. Core attendees are TB Nurses, Respiratory/Chest Consultants, Infectious Disease Consultants, Paediatric Consultants, Microbiologists and Public Health professionals from Local Government and PHE.

Attendance at Cohort Audit continues to grow and the number of attendees can be found in appendix 6.

All attendees, presenters and chairs are issued with a certificate of attendance, which they use alongside their reflective notes to evidence their learning for CPD.

North West TB Audit Outcomes

At the outset the steering group agreed 9 outcomes to monitor improvement, based on measures that had been used in cohort audit in other areas of the world.

Outcome Measures from 2013/14

1. 100% of patients will have a standardised risk assessment carried out to identify those with complex needs
2. At least 5 contacts will be identified for each case of confirmed smear positive Pulmonary/Laryngeal TB
3. At least 90% of identified contacts of each Pulmonary/Laryngeal TB smear positive index case, will be assessed.
4. 100% of children, 16 or under, who are contacts of a TB case (regardless of site) will be assessed
5. 100% of cases will be offered an HIV test and the outcome documented
6. At least 85% of all TB cases will complete treatment within one year unless drug resistant
7. Less than 2% of cases will be reported as lost to follow up at the end of planned treatment.
8. 100% of cases will be logged onto ETS within 5 working days of treatment starting
9. 100% of cases will categorised with a level of ECM 0,1,2,or 3

In year 1, there were two outcomes that considered the offering and use of Directly Observed Therapy (DOT) which were removed for year 2 and replaced with measures focused on improving the timeliness of notification and quantifying enhanced case management. These outcomes were:

- 100% of Pulmonary/Laryngeal TB smear positive cases with one or more risk factor will be offered DOT
- At least 95% of Pulmonary/Laryngeal TB smear positive cases with one or more risk factor will receive DOT

Things to note when reading this report

1. Cohort Audit runs on a financial year basis (April to March) (see appendix 3 for more details of meetings and cases reviewed).

   Year 1 – Cases reported on ETS from July 2011 to June 2012

   Year 2 – Cases reported on ETS from July 2012 to June 2013

2. TB cases identified post mortem are presented in full at cohort audit but the data is excluded from Outcomes 1,5,6,7 and 8.

3. When looking at the charts it should be remembered that the Greater Manchester Area Team area accounts for 60% of the North West TB patients. In the other Area Team areas, patient numbers are significantly less and as such 1 patient can significantly alter the percentages achieved and greater fluctuations in percentages are seen.

4. Although the health landscape in the North West changed on 1 April 2013, both years data have been presented on the five Area Team footprints in the North West to allow comparison of data across both years. Patients have been allocated to an Area Team footprint using their residential postcode.

Analysis and Findings

The following is a summary of the analysis of the key findings for the first two years (R1 – R8) of TB Cohort Audit. In total 1,515 cases were reviewed, all of which were resident in the North West of England.

A summary of the outcomes for each Area Team can be found in appendix 7. It is important to note that these figures may differ slightly from the number of cases that are recorded in the ETS system where logistical considerations unavoidably precluded consideration of all cases in a particular Round.

Profile of cases reviewed

Number of cases reviewed in each Area Team (AT)

The Greater Manchester AT has the majority of cases within the North West (60% of the total cases for the first two years of Cohort Audit. Lancashire has the next highest percentage at 22% of cases, with the remaining ATs accounting for less than 10% each).

	Number of Cases per Round									
NHS England Area Team	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**	**Total No of cases reviewed**	**Percentage of total cases (%)**
Greater Manchester	104	133	97	120	121	114	102	114	**905**	**60**
Cheshire Warrington Wirral	9	6	8	13	13	6	11	23	**89**	**6**
Merseyside	10	14	23	19	12	19	15	18	**130**	**9**
Lancashire	36	30	44	48	32	52	28	60	**330**	**22**
Cumbria	7	3	15	8	10	4	6	8	**61**	**4**
North West	**166**	**186**	**187**	**208**	**188**	**195**	**162**	**223**	**1515**	**100**

Table 1: The number of cases reviewed, by Area Team footprint

Outcomes

A summary of the results for each of the nine outcomes follows. In each Figure the vertical axis is the proportion of patients achieving that outcome and the horizontal axis is the round. A linear trend line is superimposed on each histogram.

Outcome 1: 100% of patients will have a standardised risk assessment carried out to identify those with complex needs

Figure 1: Percentage of patients who received a standardised risk assessment by Area Team footprint

Standardised risk assessment (SRA) is important because it allows all cases to be appropriately and consistently assessed to identify people who require additional support. This will allow consideration of whether the case requires Enhanced Case Management (ECM) or if they can be managed under standard care pathways.

There was a rising trend of completion of standardised risk assessment (SRA) across all areas and the North West.

In year 2, the overall percentages achieved across the 5 North West Area Teams was between 96% and 100% with only 7 cases across the North West who did not have an SRA completed (compared to 50 cases in year 1). Of these 7 cases;

- Two cases were lost to follow up. The patients had moved/returned abroad before culture results confirmed their TB diagnosis. In both cases attempts were made to ensure the patients were aware of their diagnosis.
- Five of the patients died before the risk assessment could be completed.

Those patients diagnosed post-mortem have been excluded from this outcome.

	2011/12 Year 1	**2012/13 Year 2**
Greater Manchester	93%	100%
Cheshire Warrington Wirral	97%	96%
Merseyside	94%	98%
Lancashire	94%	98%
Cumbria	97%	100%
North West	93%	99%

Table 2: Percentage of cases with a completed SRA by Area Team for years 1 and 2

Outcome 2: At least 5 contacts will be identified for each case of confirmed smear positive Pulmonary/Laryngeal TB

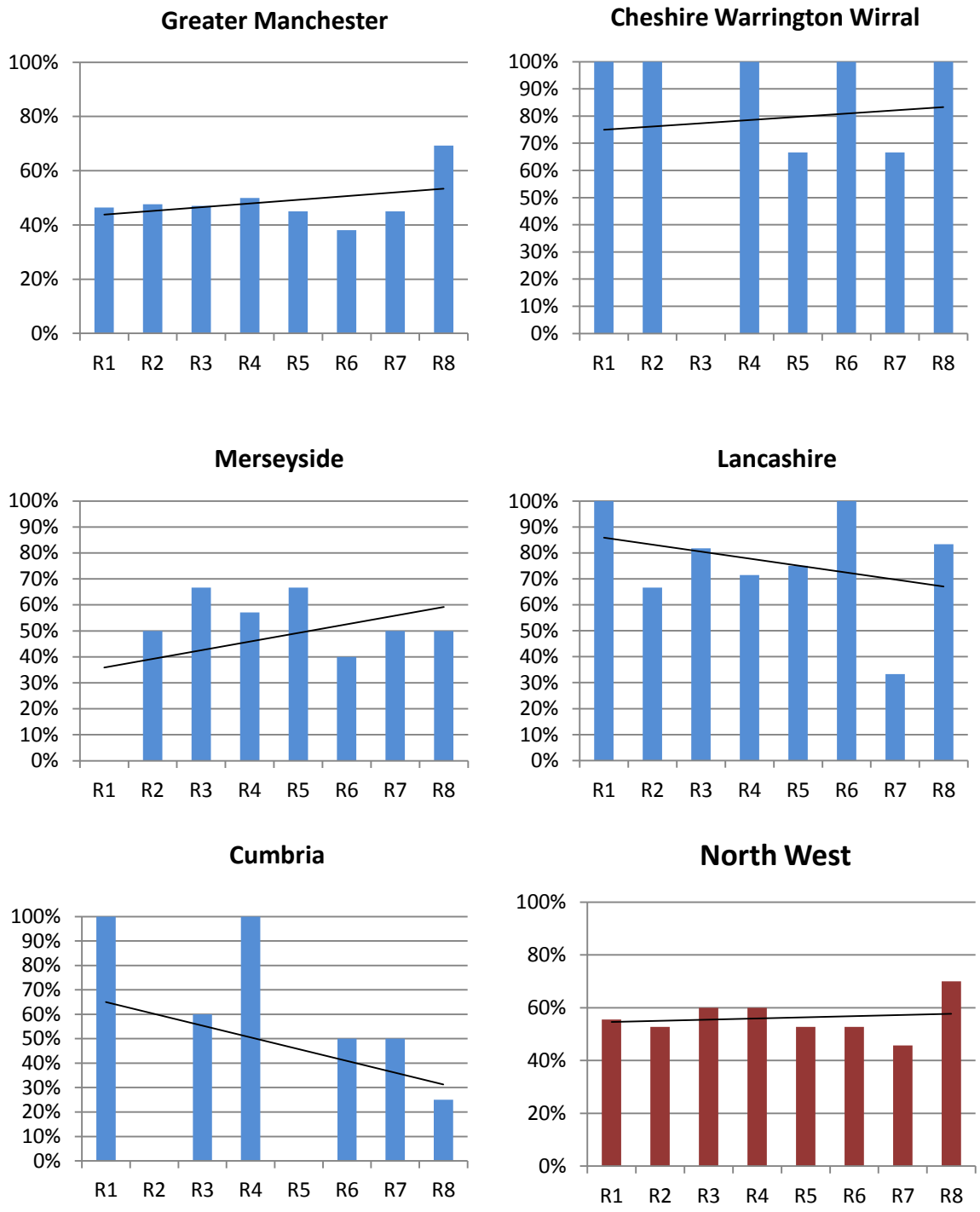

Figure 2: Percentage of smear positive pulmonary/laryngeal TB cases where at least 5 contacts were identified

A person who has a smear positive sputum for TB is likely to be infectious, and so identification of contacts of smear positive cases is important to ensure that all people who have been in contact with the case are identified and offered screening for disease, and where appropriate, treatment.

There is always debate at cohort audit as to whether 5 contacts is the right number. There is no evidence base for this figure, but it provides a standard against which performance can be compared.

The number of contacts for each case can vary greatly. Significant effort is put into identifying contacts but it is difficult to evaluate whether all contacts for every case have been identified. However, it is important to note that often patients will genuinely not have 5 contacts as they might live alone and/or have little contact with others.

In some communities, stigma can be a significant factor affecting the willingness of TB patients to identify contacts. Potential criminal activities (e.g. illegal entrants, substance misusers) can also affect this.

Where a patient was identified through contact tracing, the number of contacts identified is usually low as they often have a large number of contacts in common with the index case and these are not counted again.

Where contacts are identified who live out of area from the index case, the TB Nurses liaise with the relevant TB service to arrange the assessment of the identified contacts. Over the first two years of cohort, 10% of contacts were identified elsewhere.

Overall across the North West, the percentage of cases with 5 or more contacts identified remained consistent in the first two years at 57% and 56%.

Greater Manchester consistently have a fewer number of cases where 5 or more contacts are identified as compared to the rest of the North West with 47% and 48% on average over the two years. Cheshire, Warrington and Wirral (83% and 78%) and Lancashire (77% and 76%) consistently have the highest rates.

	Year 1	Year 2
Greater Manchester	48%	47%
Cheshire Warrington Wirral	83%	78%
Merseyside	56%	50%
Lancashire	77%	76%
Cumbria	67%	30%
North West	57%	56%

Table 3: Percentage of smear positive Pulmonary/ Laryngeal cases where 5 or more contacts were identified

Outcome 3: At least 90% of identified contacts of each pulmonary/ Laryngeal TB smear positive index case, will be assessed

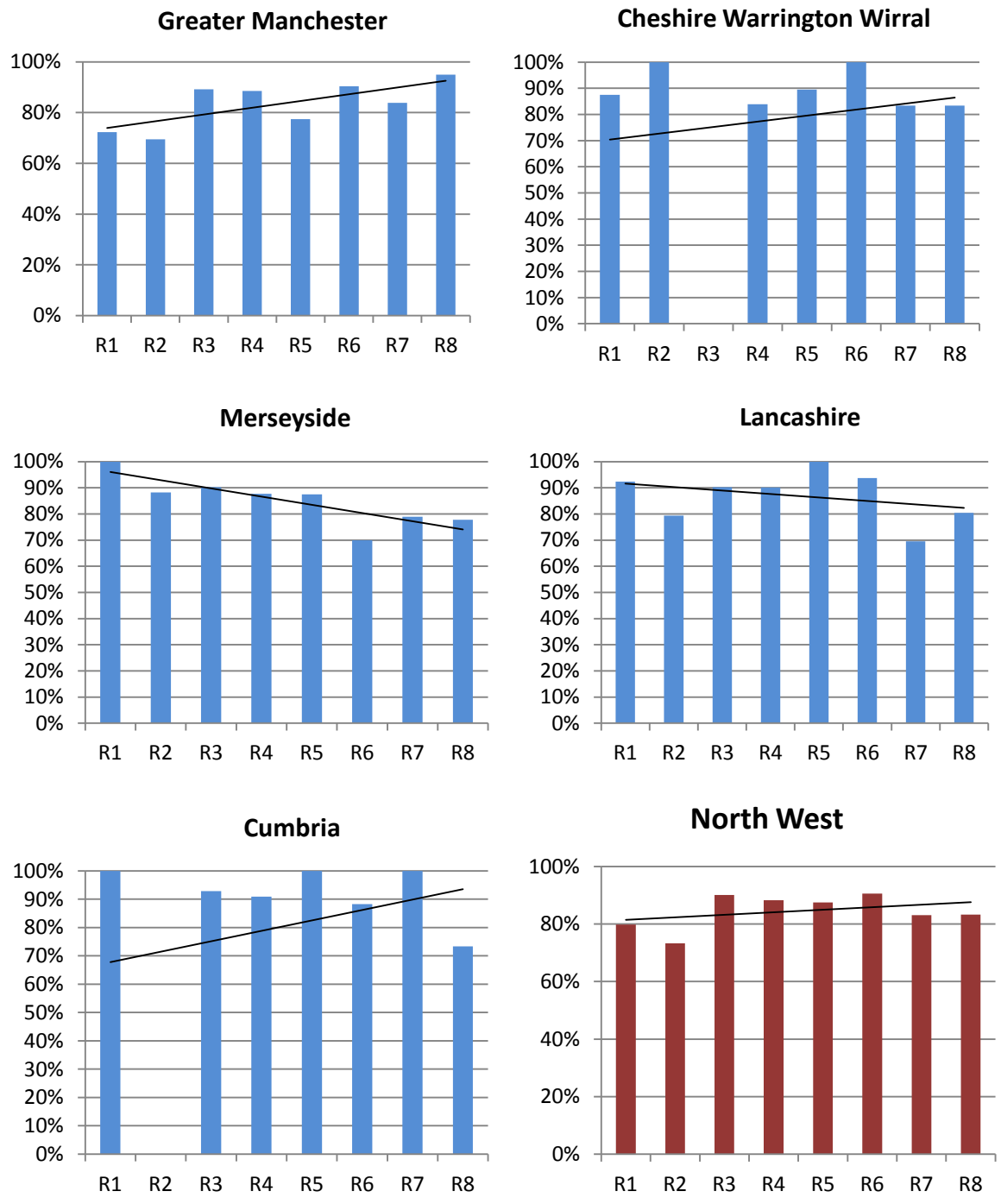

Figure 3: Percentage of identified contacts of pulmonary/laryngeal TB cases that are assessed

Once contacts of smear positive cases have been identified, it is important to ensure that these contacts are offered assessment and screening for TB infection. Ideally, all contacts should be assessed, but the target of 90% has been set in recognition that some contacts will refuse assessment, or cannot be located to offer screening. Where contacts are in a different region of the UK, the local TB nurses work with services in that area to ensure assessment of the contacts takes place.

Those contacts who only attend for part of the assessment process are recorded as not having been assessed.

We are currently just short of achieving this target with the proportion of contacts in the North West who are assessed at 85% in year 1 and 86% in year 2.

	Year 1	Year 2
Greater Manchester	78%	85%
Cheshire Warrington Wirral	86%	90%
Merseyside	89%	79%
Lancashire	89%	87%
Cumbria	94%	87%
North West	85%	86%

Table 4: Percentage of identified contacts of pulmonary/ laryngeal TB cases assessed in years 1 and 2

The contact tracing of a number of index cases involved large scale exercises at educational establishments (schools, colleges or evening schools). Further information on these can be found on page 28.

Outcome 4: 100% of children, 16 or under, who are contacts of a TB case (regardless of site of disease) will be assessed

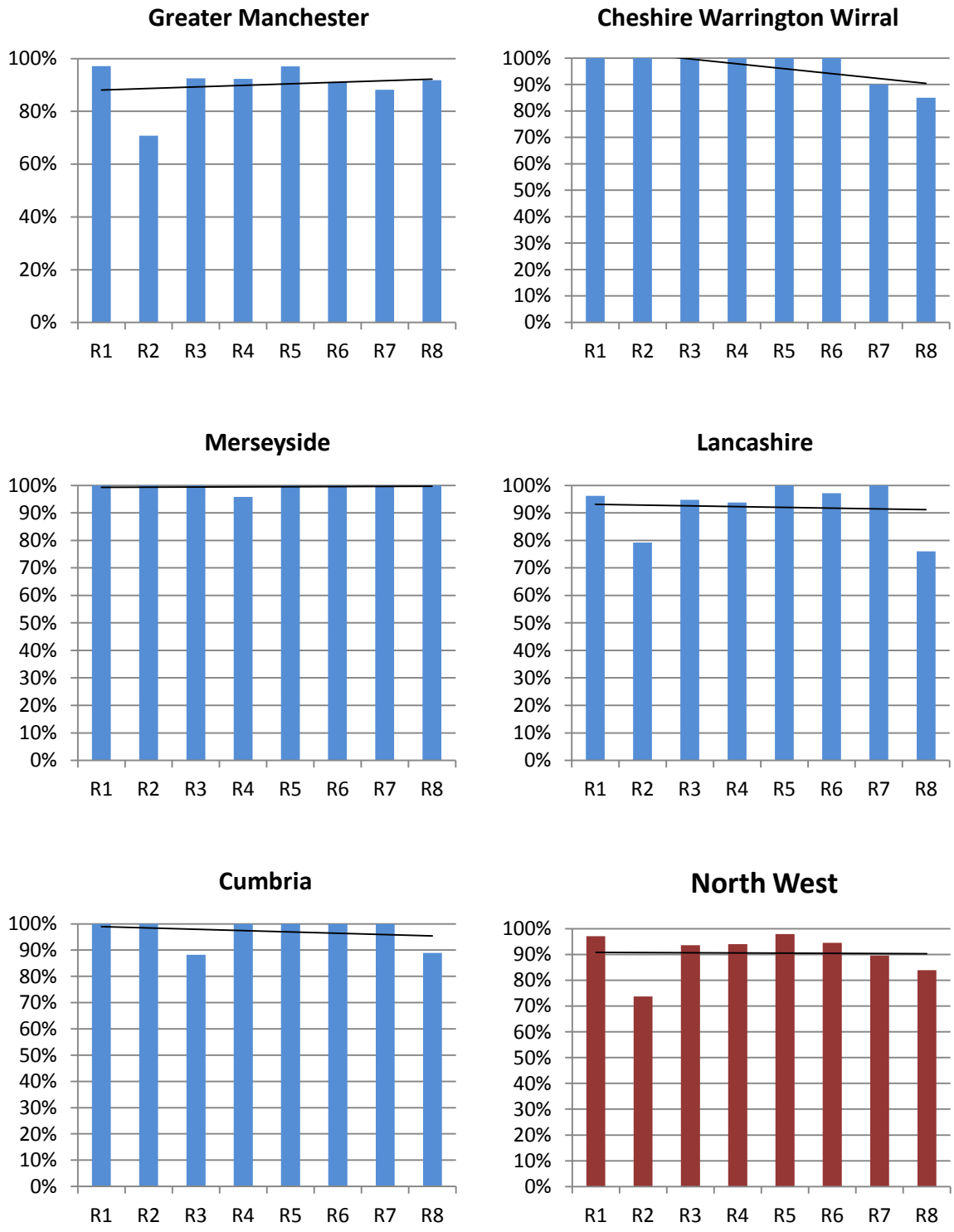

Figure 4: Percentage of children 16 years and under who are contacts of a TB Case (any site of disease) that are assessed

It is particularly important that children who are contacts of TB cases are identified and assessed, as children are more susceptible to TB and are at higher risk of morbidity and mortality from the disease

The proportion of child contacts assessed has improved from 88% to 90% overall in the North West. The target was met in year 1 in Cheshire, Warrington and Wirral and in year 2 in Merseyside. If a child only partially completes the assessment process they are recorded as not assessed.

	Year 1		Year 2	
Greater Manchester	614/727	84%	719/789	91%
Cheshire Warrington Wirral	41/41	100%	41/45	91%
Merseyside	53/54	98%	39/39	100%
Lancashire	327/354	92%	379/433	88%
Cumbria	39/41	95%	36/37	97%
North West	1074/1217	88%	1214/1343	90%

Table 5: Number and Percentage of children 16 years and under who are contacts of a TB Case (any site of disease) that are assessed

Outcome 5: 100% of cases will be offered an HIV test and the outcome documented

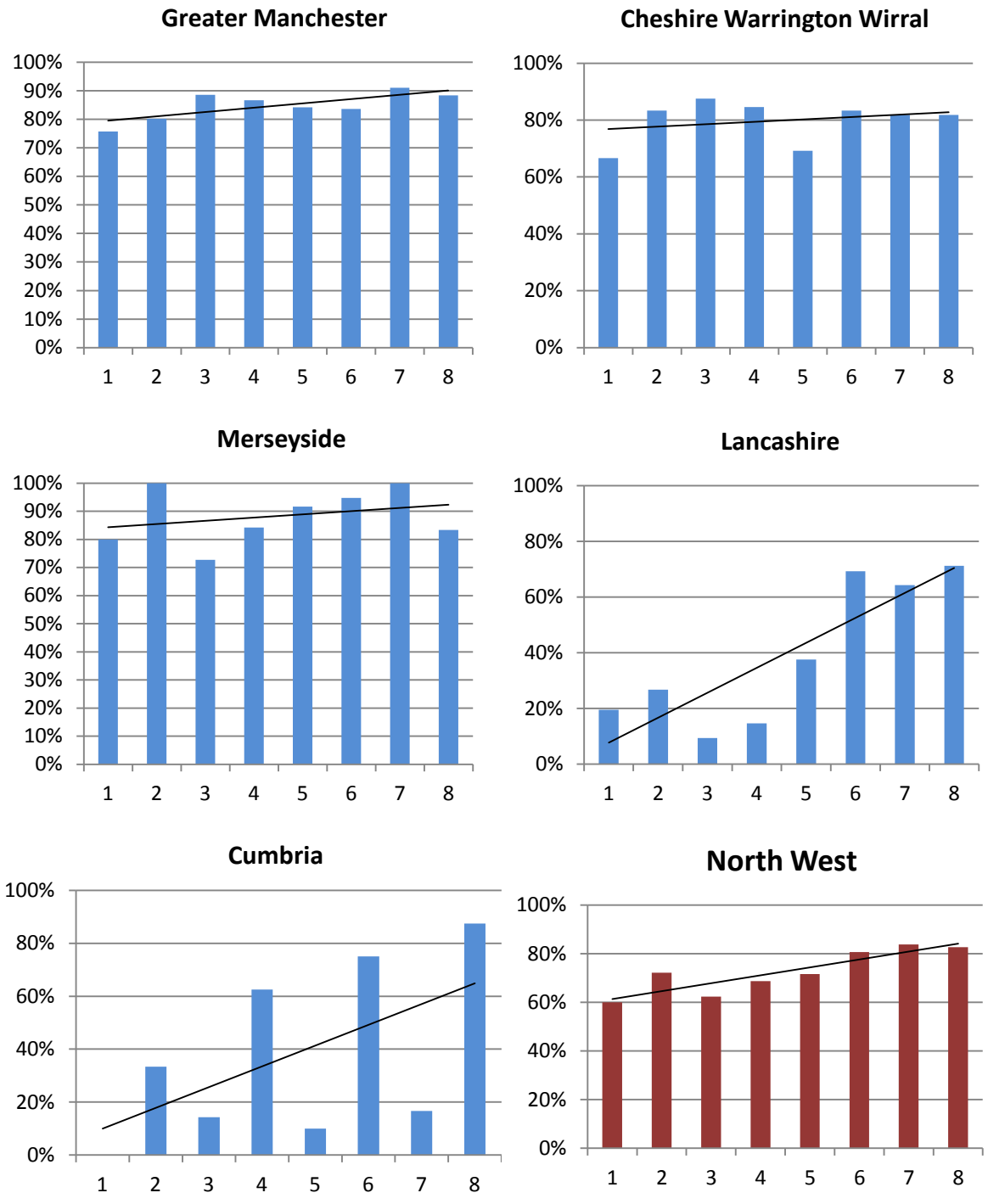

Figure 5: Percentage of cases who were offered an HIV test and the outcome was documented

Identification of co-infection with HIV is an important aspect of TB management. TB illness may be the index presentation for previously undiagnosed HIV infection. People with HIV and AIDS have a compromised immune system and the drugs being used to treat HIV may interfere with treatment for TB and vice versa. Individuals with HIV are also much more likely to be affected by TB infection, and the risk of death is greater.

In year 2, the percentage offered an HIV test increased overall in the North West from 66% to 80%. All areas except Cheshire, Warrington and Wirral increased in year 2 with significant improvements in Lancashire (17% to 63%) where cohort audit highlighted a previous significant difference in practice. Access to HIV test documentation remains an issue in some areas. Where TB Nurses have been unable to access HIV test documentation, it is recorded that it was not offered.

Post Mortem cases are excluded from this outcome.

	Year 1	Year 2
Greater Manchester	83%	87%
Cheshire Warrington Wirral	81%	79%
Merseyside	83%	92%
Lancashire	17%	63%
Cumbria	25%	43%
North West	66%	80%

Table 6: Percentage of cases offered an HIV test and the outcome documented

HIV testing in Paediatrics

There appears to some variation in practice across the region in index cases aged 16 and under, but numbers are small.

	Case numbers	Percentage
Greater Manchester	51/55	93%
Cheshire Warrington Wirral	0/3	0%
Merseyside	2/5	40%
Lancashire	3/22	14%
Cumbria	2/2	100%
North West	58/87	67%

Table 7: Number and percentage of Paediatric cases offered an HIV test and the result documented

At Manchester Children's Hospital, 100% had an HIV test offered and the result documented (32/32 cases) but at Alder Hey, only 40% (2/5 cases) did. Of cases treated elsewhere, on average, 48% were offered an HIV test (24/50 cases).

Outcome 6: At least 85% of all TB cases will complete treatment within one year unless drug resistant

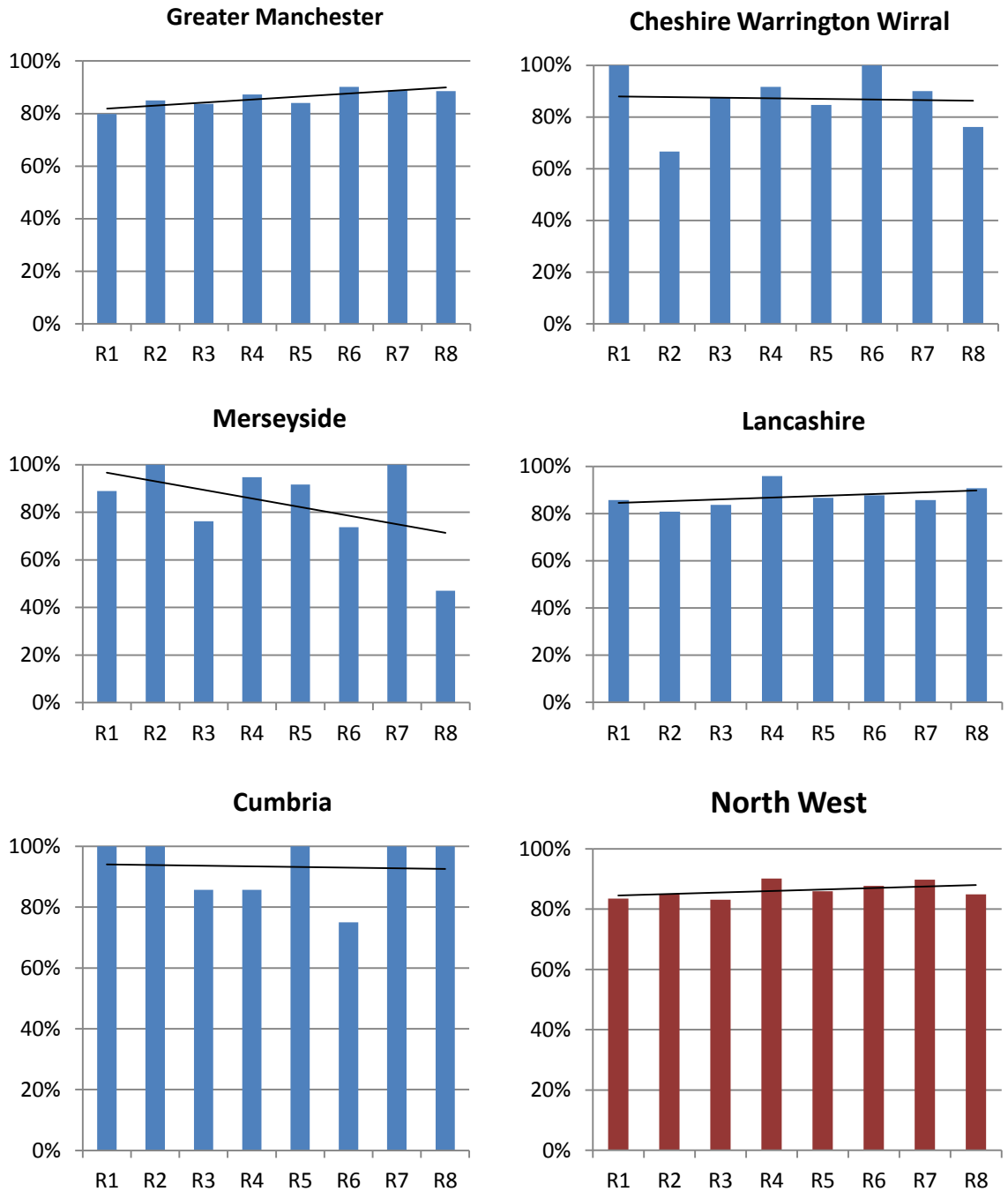

Figure 6: Percentage of non drug resistant cases that complete treatment within 1 year

Completing treatment within 12 months is vitally important to control the spread of disease and prevent drug resistance developing. The Cohort Audit target of 85% of cases completing treatment is in line with the standard set by the Chief Medical Officer in 2004.

The proportion of cases completing treatment fluctuates each quarter across locality, but overall shows the 85% target being met or exceeded in every Round except Rounds 1 (84%) and 3 (83%). This demonstrates a consistently high treatment completion rate throughout the two years. Overall, the North West exceeded this target for both years 1 and 2 (86% and 87% respectively).

The main factors associated with not completing treatment within one year were patients dying (from TB or other causes) before completing treatment or patients who were lost to follow up. Other factors included where treatment had to be re-started due to drug intolerances or periods of non-compliance. Some sites of disease also require a longer standard period of treatment such as TB Meningitis (12 months).

The significant dip in Round 8 in Merseyside (47%) was due to a particularly unusual cohort of patients. Of the 17 patients, 9 are recorded as failure to complete. Of these, 4 died, 2 transferred out of the region, 1 was lost to follow up in the last 2 weeks of treatment, 1 refused to accept their TB diagnosis and in 1 case a decision was made to stop treatment (they were subsequently found not to have TB).

Patients identified at post-mortem are excluded from this outcome.

	Year 1	Year 2
Greater Manchester	85%	88%
Cheshire Warrington Wirral	88%	84%
Merseyside	89%	76%
Lancashire	88%	88%
Cumbria	90%	96%
North West	86%	87%

Table 8: Percentage of non drug resistant cases that completed treatment within 1 year.

Outcome 7: Less than 2% of cases will be reported as lost to follow up (LTFU) at the end of planned treatment.

	Year 1 2011/12		Year 2 2012/13	
	Percentage	No. of cases LTFU	Percentage	No. of cases LTFU
Greater Manchester	4%	17	3%	13
Cheshire Warrington Wirral	0%	0	2%	1
Merseyside	5%	3	3%	2
Lancashire	3%	4	2%	4
Cumbria	0%	0	0%	0

Table 9: Percentage and number of cases LTFU in years 1 and 2

Cases of TB that cannot be followed up to complete treatment present a risk of ongoing transmission in the community. It is therefore important to minimize the numbers of cases that are lost to follow-up[2] (LTFU).

The proportion of cases lost to follow up fluctuated each round, due to the small numbers involved. Overall, 24 patients were lost to follow up in year 1 reducing to 20 in year 2. In most Area Team footprints, a single patient lost to follow up will mean the target is not met.

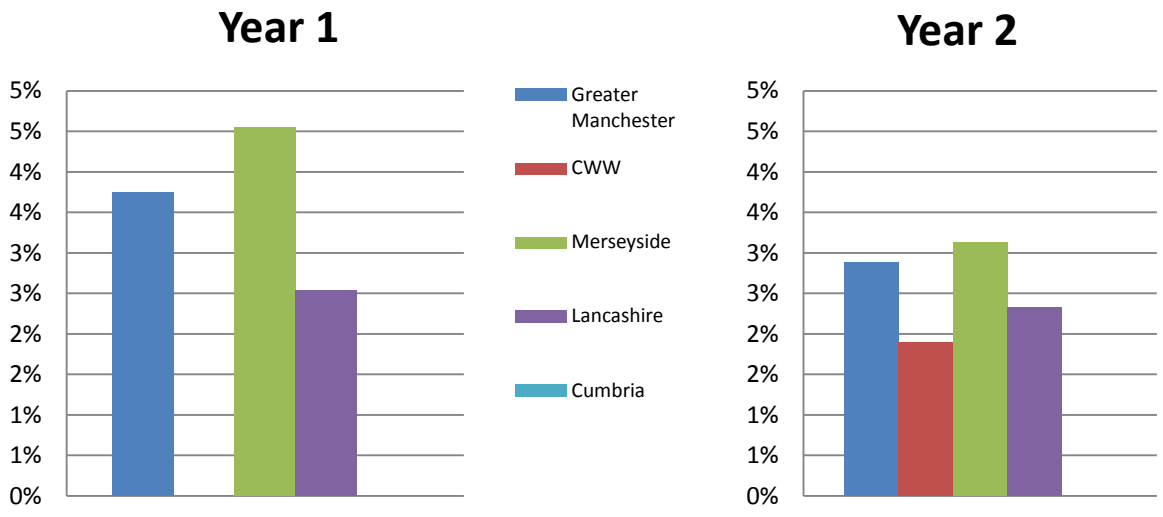

Figure 7: Percentage of cases lost to follow up

[2] 'Lost to follow up' is defined as: a patient on self-administered treatment who cannot be contacted within 10 working days of a missed appointment or for someone on DOT, cannot be contacted within 10 working days of a missed DOT appointment. This does not include those patients who have a planned discharge out of the country or to another UK TB Service.

TB Nurses make extensive efforts to contact all TB patients who have missed appointments.

Often patients will travel abroad for extended periods during treatment. When informed of travel plans, TB Services can provide patients with medication and/or referral letters to take with them. However, some fail to return as planned or TB Nurses are unable to verify that they have taken the medication provided and/or have re-registered with a TB Service abroad. As can be seen in Table 10, in 16 of the 44 cases identified as lost to follow up the TB service did provide the patient with a referral letter or at least 1 month's medication to take with them. In other cases, friends or relatives may provide some information on where a patient has moved to but TB Nurses are unable to make contact with the patient.

	No of cases
Total number of cases lost to follow up	44
Known to have returned/moved abroad	30
Known to have moved from NW but within UK	5
Left the NW with at least 1 months meds/referral letter/contact after leaving	16
Location of patient unknown	9

Table 10: Breakdown of reasons that cases were lost to follow up (years 1 and 2)

Of the 44 cases lost to follow up:

- One was MDR (extra-pulmonary). Three were INH resistant (2 extra-pulmonary, 1 smear negative pulmonary TB).
- Eight patients were classified as 'hard to reach '[3]
- 100% were aged 18 and over with the majority (73%) aged between 18 and 50.
- Six (14%) were UK Born
- 27/36 (75%) of those known not to be UK born, entered the UK within 5 years of their symptom onset.
- 36% were of Pakistani ethnicity, 27% Indian, 18% White, 7% Black-African, and 11% other or unknown.

Post-mortem cases were excluded from this outcome.

[3] 'Hard to reach' patients at risk of TB include children, young people and adults whose social circumstances or lifestyle, or those of their parents or carers, make it difficult to;

- Recognise the clinical onset of TB
- Access diagnostic and treatment services
- Self-administer treatment (or, in the case of children and young people, have treatment administered by a parent or carer)
- Attend regular appointments for clinical follow-up

Outcome 8: 100% of cases will be entered onto ETS within 5 working days of treatment starting.

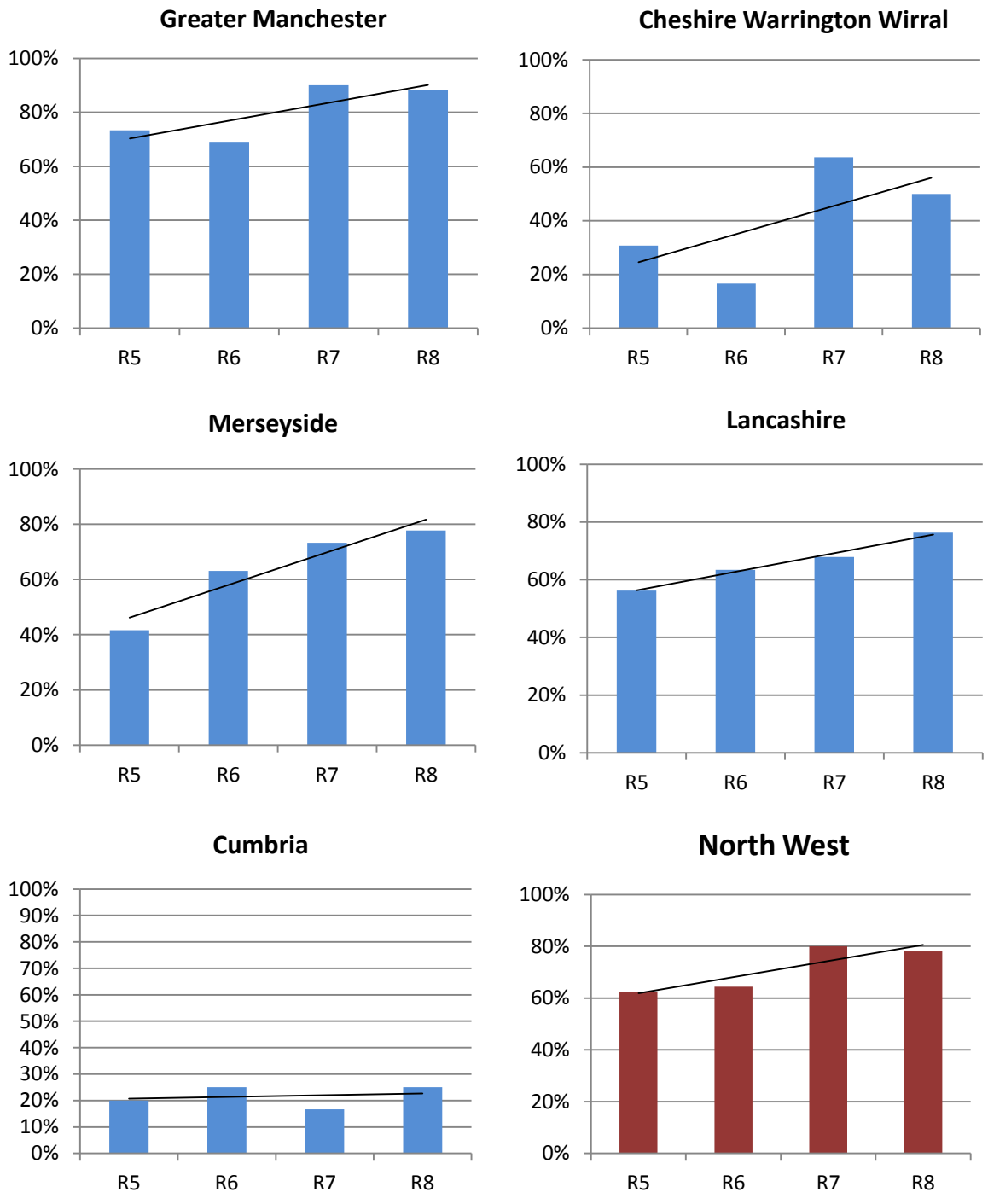

Figure 8: Percentage of cases entered onto ETS within 5 working days of treatment starting

It became apparent during year 1 of cohort audit, that there was a huge variation in the time taken to undertake the statutory notification of TB cases. It was also noted that despite the introduction of ETS, some Trusts were still notifying via a paper system. A letter was sent out to all NW Trusts in December of 2012 (see appendix 9) reiterating the importance of timely notification of cases and the Cohort Steering Group decided to reinforce this by including it as an outcome for cohort audit in year 2.

Round 7 is the first Round of cohort audit with patients notified after the letter was sent out. The percentage notified within 5 working days of treatment dramatically increased throughout year 2 with 80% and 78% being reported within 5 working days in Rounds 7 and 8 respectively (up from 63% in Round 5).

Although there has been considerable improvement in this outcome across the Area Team footprints, there is still room for improvement, particularly in Cheshire, Warrington and Wirral and Cumbria. The prompt notification of cases is key to the effective public health management of TB as it allows the full epidemiological picture to be investigated and analysed.

	Year 2
Greater Manchester	80%
Cheshire Warrington Wirral	44%
Merseyside	66%
Lancashire	67%
Cumbria	21%
North West	71%

Table 11: Percentage of cases in year 2 entered onto ETS within 5 working days of treatment starting.

Outcome 9: 100% of cases will be categorised with a level of Enhanced Case Management (ECM).

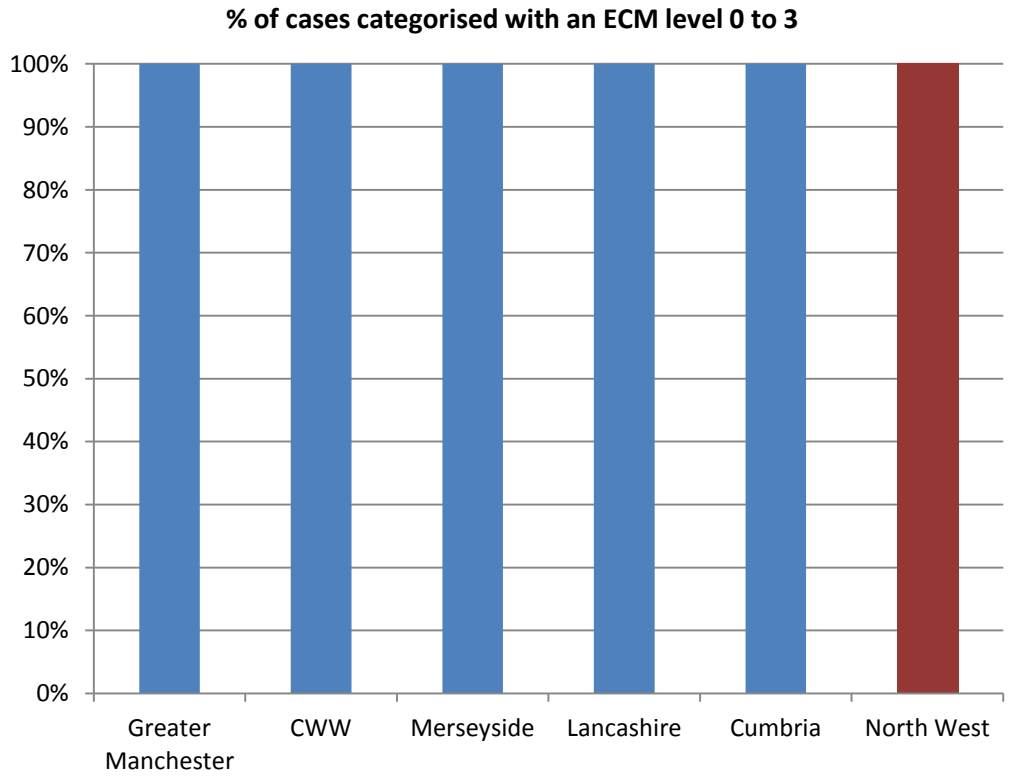

Figure 9: Percentage of cases categorised with a level of Enhanced Case Management from 0 to 3

Enhanced Case Management (ECM) applies to any case where more than the usual amount of TB Nurse time is required for their management. Where a case required no enhanced case management it was categorised as level 0 (zero).

Understanding the pattern of cases requiring ECM in the North West is fundamental to future manpower planning for TB Nurses. During the cohort audit meetings in Year 1, it became apparent that there was a huge variation in the level of Nurse input required for ECM cases, ranging from those that required a little extra time to those that required quite extensive additional time. Given this variation in workload, nurses had also expressed difficulties in determining if a case should be classed as requiring ECM or not.

For year 2, the Cohort Audit Steering Group agreed a series of levels in an attempt to quantify the workload of a case requiring ECM and set an outcome that 100% of cases in the NW should be categorised using this system (including post-mortem cases).

For cases requiring some enhanced case management, cases were categorised from level 1 (some additional time spent managing the case) up to 3 (where a large amount of extra time is required to manage the case). Further detailed information about the levels of ECM is available in appendix 8.

As can be seen in Figure 9, 100% of cases were categorised.

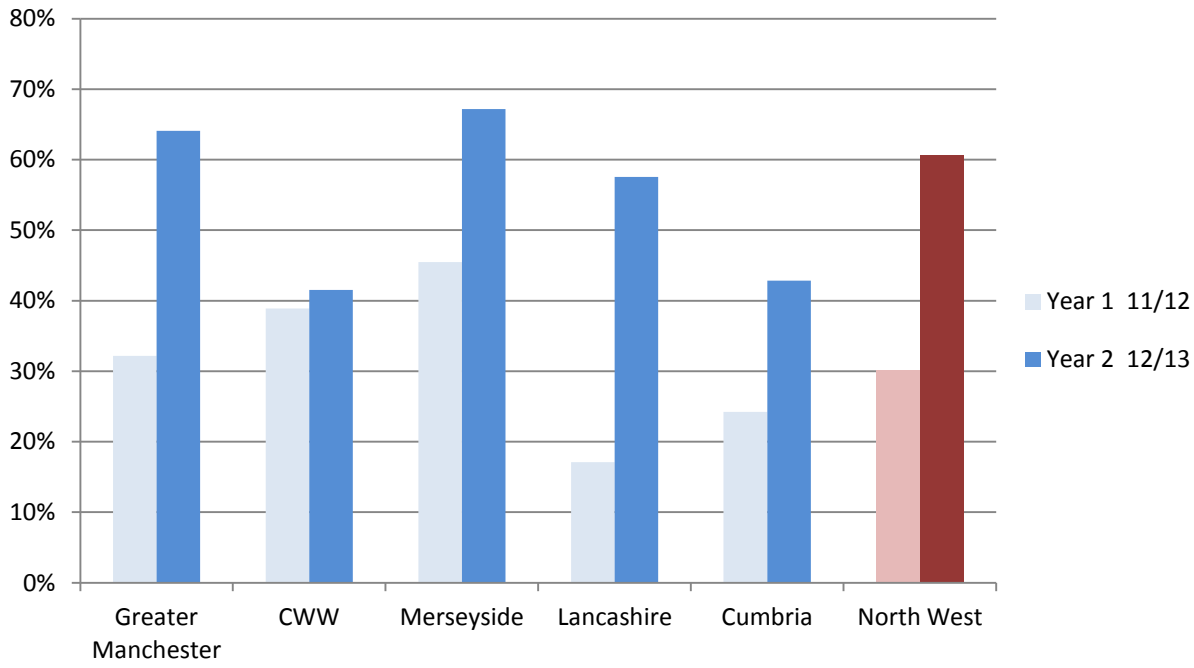

Figure 10: Percentage of cases requiring ECM levels 1-3

It was noted that the percentage of cases requiring ECM has doubled overall in the NW in year 2 from 30% to 61% (Figure 10). Only in Cheshire, Warrington and Wirral has the percentage of cases remained similar (39% to 42%). One explanation for the widespread increase is that Nurses had previously been underestimating the workload of the lower level ECM cases and had not categorised them as ECM.

Further information on the levels of ECM in year 2 is available on page 28/29.

In Depth

Large Contact Tracing Exercises

There have been 7 large (over 45 contacts) contact screening exercises over the two year period associated with educational establishments (school/college/evening schools).

These events present particular issues as opposed to screening a small family group. Managing the workload of these and accessing sufficient administrative help is vital to their success.

Generally these large exercises achieve a high percentage of contacts assessed but in one instance in Lancashire in year 2, the age group was in year 11 and diagnosis occurred at the end of the school year. 47% failed to complete the screening process despite numerous attempts by the school and TB service to contact the children.

All these events had index cases with pulmonary TB, with 6 confirmed as smear positive, fully sensitive TB (in 1 case, sputum and culture samples were not available). Four of the index cases were 16 or under, all were under 35 years of age. Four of the 7 index cases were UK born.

NHSE LAT	Round	Child contacts identified	Child contacts assessed	% assessed	Adult Contacts Identified	Adult contacts Assessed	% Assessed
Greater Manchester	R2	54	54	100%	43	42	98%
Lancashire	R3	91	83	91%	281	248	88%
Greater Manchester	R3	78	71	91%	31	28	90%
Lancashire	R4	45	39	87%	6	6	100%
Lancashire	R6	115	110	96%	11	5	45%
Greater Manchester	R7	160	145	91%	45	38	84%
Lancashire	R8	104	55	53%	18	13	72%

Table 12: Number and percentage of contacts assessed in cases with over 45 contacts

Enhanced Case Management

The Steering Group undertook a piece of work, led by Jenny Walker from Liverpool Community Health Trust, to describe the likely features of a case at each of 3 levels of ECM. More detailed information on this process and examples of the features of cases at each level are provided in appendix 8.

Generally across the North West, in year 2 of cohort audit, 61% of cases required some level of ECM. Of the cases requiring ECM, 45% required level 1 ECM, 32% level 2 and 23% level 3, the most intensive level of support.

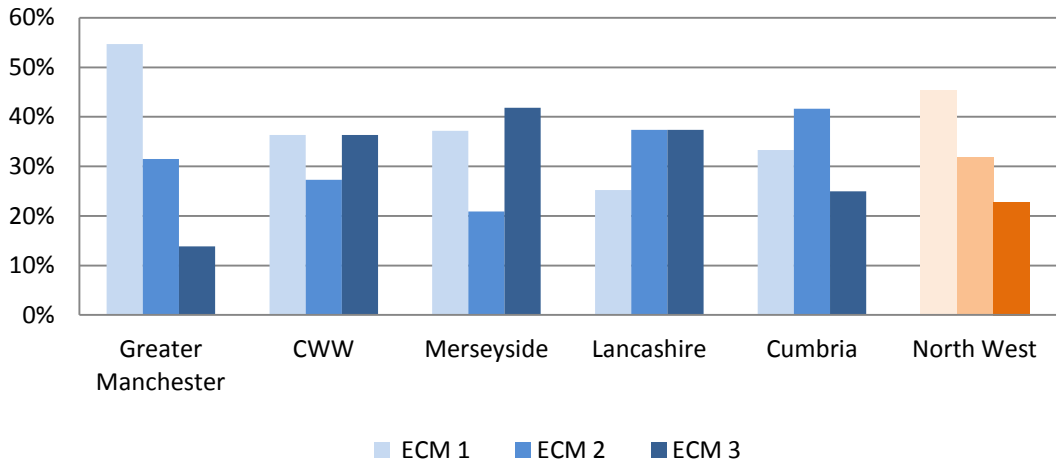

Figure 11: Percentage of ECM cases categorised as level 1, 2 and 3

It can be seen in Figure 11 that there appears to be some variation between Greater Manchester and the rest of the North West. In Greater Manchester, a higher percentage of cases are at level 1, with a smaller percentage of cases at level 3. We are not currently clear as to why this might be.

	ECM 1	ECM 2	ECM 3
Greater Manchester	55%	31%	14%
Cheshire Warrington Wirral	36%	27%	36%
Merseyside	37%	21%	42%
Lancashire	25%	37%	37%
Cumbria	33%	42%	25%
North West	45%	32%	23%

Table 13: Percentage of cases categorised as levels 1-3 by Area Team

Post-Mortem Cases

Each year there are a small number of cases of TB identified at post mortem. All these cases are presented at cohort audit meetings but we exclude the data from a number of the outcomes (Outcomes 1, 5, 6, 7 and 8).

	Year 1 Total	Year 2 Total
Greater Manchester	6	9
Cheshire Warrington Wirral	0	1
Merseyside	2	0
Lancashire	1	1
Cumbria	1	0
North West	**10**	**11**

Table 14: Number of post mortem cases by Area Team in years 1 and 2

Several issues have been identified at cohort with post-mortem cases. In some instances, the Coroner has failed to notify the TB service of a TB diagnosis which has led to delays in starting contact tracing. In these cases, it is usually the patient's GP or relatives who contact the TB Service to enquire about screening. There are also issues where samples are not sent for culture so limiting the information available to the TB Service when treating relatives who may be identified as having latent or active TB through screening.

Conclusions

TB Cohort Audit has run very successfully for two years in the North West. All notified TB cases have been audited over a large and very diverse region through an effective collaborative effort.

The overall standard of TB case management in the North West has been found to be excellent. Baseline levels of practice were found to be good for most outcomes, and where good have been maintained or even improved. Improvement has been seen for the few outcomes that were not so well achieved. North West TB Cohort Audit is unique in capturing some important TB outcomes, such as aspects of contact tracing, which are not routinely captured elsewhere.

Many issues have been identified where improvements are necessary, and North West TB Cohort Audit acts as a forum for the identification and resolution of such issues. Lessons learnt are detailed in appendix 1.

Anecdotally TB staff found North West TB Cohort Audit to be constructive and useful. Further details of this will be reported separately from the qualitative research project. Continued and growing attendance at North West TB Cohort Audit meetings supports this conclusion. A look forward to further improvements is detailed in appendix 2.

Appendices Index

Appendix 1: Lessons Learnt

The following issues and themes reflect the wide range of case discussions held at cohort audit by the multi-disciplinary TB professionals present. They are advisory in nature and represent the consensus reached by attendees.

Running Cohort Audit

There are several key elements to running an effective cohort audit;

1. **Co-ordination:** The role of the Cohort Coordinator is key to the smooth running of the audit meetings. From year 2, dates were circulated for the whole year ahead to facilitate planning attendance.
2. **Networking:** Cohort Audit meetings are a key opportunity for TB services to network and build relationships with neighbouring services. It is important that the cohort audit meeting has adequate break and lunch periods to allow for informal networking. This is particularly important for the TB Nurses who often work alone in a community setting.
3. **Effective Chairing:** The Steering Group developed a Person Specification for the Chair (see appendix 4). Where serious concerns are raised during an audit meeting, the Chair is required to lead on seeking a resolution or ensuring action is taken. This has been formalised into a Protocol (see appendix 10). Nursing Co-Chairs are also to be introduced in Year 3 as well as additional clinical chairs. The Chairs do not chair a meeting in their own area.
4. **Clinical representation at the meetings:** This is vital for several reasons. Primarily that they are there to support their TB Nurses in their presentation of the cases and to explain the clinical decisions taken. This also generates discussion and increases learning opportunities. There are still some TB Services in the North West who have failed to send a clinician to cohort and this is something the TB Steering Group are keen to address. Chairs will be asked to contact those not attending.

Reporting

The immediate feedback on the 9 outcomes on the day is extremely useful and these are repeated in the introduction of the next meeting. However, the Steering Group has acknowledged that formal reporting of the outcomes has been inadequate and detrimental to the seeking of funding. In year 3, formal quarterly reports will be sent out to the TB services along with an annual report.

Best Practice

1. **Importance of prompt and accurate completion of ETS notification:** The introduction of the target in year 2 has helped focus attention on the importance of this to facilitate the effective public health management of the disease. Discussions at cohort highlighted that an earlier notification onto ETS before, for example, culture results are available, has meant TB services have needed to adapt their practice to prompt them to go back to ETS to ensure completeness of data. Trusts may need to ensure they have additional staff able to register cases onto ETS to cover periods of leave etc. The full and accurate notification of cases is important in helping to identify clusters as well as enabling accurate analysis of the data to identify trends.
2. **HIV testing rates:** The first year of cohort audit highlighted the differences in practice regarding the offering of HIV testing across the North West. The offering of an HIV test is advised/ required by NICE guidance (CG117[4]). This should be offered to all patients, regardless of their perceived risk profile for HIV. Agreement has been reached through

[4] http://www.nice.org.uk/guidance/CG117

cohort that unless a previous HIV test was performed within 3 months of the TB diagnosis, it should be repeated. It is also recommended that HIV test results are communicated in writing rather than verbally to improve the reliability of the documentation.

3. **Negative Pressure Rooms:** There is a need in hospitals for negative pressure rooms that can be used for paediatric as well as adult TB cases. This would mean children could have induced sputums as well as gastric washes if needed.
4. **Getting a culture result is vital:** Rates of obtaining culture confirmation vary but it is vitally important that efforts are made to ensure we get a positive culture because without it there can be doubt about the validity of the TB diagnosis and it is difficult to confirm any strain clusters. Education is required for surgical colleagues to reduce the numbers of samples of e.g. lymph nodes, being sent to the laboratory in formalin which is unsuitable for TB diagnostic purposes.
5. **Robust referral systems:** Discussions of cases at cohort have highlighted the potential for the TB Service missing cases where referral systems are not robust – pharmacies should flag up where TB medications are dispensed to make sure the TB service is aware: robust referrals from radiology or A&E are required to ensure suspected TB cases are not missed.
6. **Repeated non compliance:** If a patient is persistently non-compliant for an extended period (3 months or more) it is recommended that treatment should be withdrawn with immediate effect as the continued chaotic ingestion of TB drugs risks causing drug resistance. If it is felt the patient poses a public health risk, and all other avenues are exhausted, the CCDC may need to obtain a detention order.
7. **Prison Cases:** These can often be complicated to manage and contact tracing can be difficult if identified prisoner contacts are released, transferred or deported on release before they can be assessed. A particular case was highlighted where the Prison Service had allowed a patient supposedly receiving Directly Observed Therapy (DOT) to self administer after 3 months, without consultation with the TB Service. They then failed to notify the TB service of non-compliance and failed to pass on details of the treatment regime (and that patient was non-compliant) to the new prison when the patient transferred. DOT was reinstated at the new prison after some delays. As a result of this case, the case review recommended for prison cases that;
    a. All patients in prison should be on DOT for the complete course of treatment
    b. Any concerns the Prison Service have should be immediately raised with the TB Service/ relevant chest clinic
    c. There needs to be a nominated contact person for the case at the prison although it is acknowledged prison staff turnover may complicate this.
8. **Choose and Book:** Delays in seeing patients referred via GPs have been discussed numerous times at cohort where the GP has inappropriately used the online 'Choose and Book' system. GP's are advised that they should not use this system where TB is suspected but instead refer them direct to the lead TB physician for their area (details available from the local CCDC).

TB Nursing and Administrative Capacity

NICE Guidance (NICE 2012) states that TB services should have a minimum staffing level of 1 nurse per 40 patients requiring "standard" care. For patients who are clinically more complex, or where there are other social factors to address, the recommended staffing ratio is increased to 1 nurse per 20 patients. Capacity planning should also reflect other issues that can significantly affect the size of case load that each nurse can work with, such as longer travel times when a service covers a large area.

Concerns have been identified through cohort audit regarding the staffing levels in many of the TB services in the North West. As more data is gathered through cohort audit, particularly the enhanced case management levels information introduced in year 2, we will be able to establish a clearer picture on the impact that staffing levels have on TB control.

Similarly, having full administrative support for TB Nurses is part of NICE compliance and is vital in enabling TB nurses to do their duties effectively. This can be critical, for example, where a large contact tracing exercise has to be carried out. Cohort audit has heard about a number of difficulties experienced by the TB nursing teams due to a lack of administrative support.

Appendix 2: Look Forward

Chairing of meetings

Nursing Co-Chairs are to be introduced in year 3 and the number of clinical Chairs increased to offer more the opportunity and to share the burden of chairing. An annual meeting for the Chairs to discuss the role is proposed and we will look to see how we might improve communication between Chairs for each footprint to ensure better follow up and feedback on issues raised.

Format of Meetings

Following requests from Consultants, in year 3 a 'current case' presentation slot will be included to take advantage of the joint expertise present in a more timely fashion. As the participants of cohort audit become more familiar with the process, presenters are to be encouraged to simplify the presentation of the straightforward cases and to expand the presentation of the more complex or interesting cases and include presentation material other than the data collection form (such as timelines, X-ray or CT scans etc).

It had been proposed that we combine some footprints to further develop the networking and learning opportunities. However, although this was generally supported by attendees, the logistics of putting together the meetings has meant that this hasn't happened to date but we will continue to look for opportunities to do this. In the meantime, attendees are encouraged to attend a different footprint from time to time, when duties permit.

Improvement and Automation of the Data Collection Process

The Public Health England (PHE) Field Epidemiology Team have refined and developed the data collection form over the first two years and now pre-populates parts of the data collection form with data from ETS. Further work in ensuring that the form functions effectively is ongoing and in the longer term it is hoped that a web-based system may be possible.

Possible Future Developments

Possible future developments include:

- Consideration of formally following up cases where treatment was not completed at the time of the initial presentation at the cohort meeting, in order to accurately document the outcome of all cases. This could provide more accurate information, in particular for the management of MDR cases which are the most expensive cases to treat.
- Further analysis of the TB cohort audit data asset to predict which cases take more time/ effort to treat, and to inform planning/commissioning for TB treatment.
- Further TB Nurse workforce planning, training and the development of future local TB leaders. Whilst this is not a cohort activity, participation in cohort audit can contribute to this process.

Reporting

Each audit meeting is recorded by the Cohort Coordinator who takes notes of issues raised, and records attendance. Suggested administrative improvements to cohort audit (e.g. improvements to the data collection form or format of the audits) are actioned by the Coordinator and PHE team, with other issues being taken to the Cohort Audit Steering Group and/or TB Summit for discussion and action where appropriate. Attendance has been excellent at all sessions, indicating that professionals find this a useful and worthwhile event. In addition, attendees get the visual feedback in the form of graphs of outcome performance from the PHE team who attend on the day. However, improved formal reporting from cohort will be initiated in year 3.

Qualitative Evaluation

A researcher has been commissioned to work with the Liverpool School of Tropical Medicine and TB nurses to complete a qualitative evaluation. This involved individual semi-structured interviews with professionals who have attended the meetings. Results will be available in Year 3.

Appendix 3: Cohort Audit Meetings

Round	Cases Logged onto ETS	Footprint	Date of Meeting	Venue	Chair
1	July to Sept 2011	Cheshire & Merseyside	4 April 2012	Foresight Centre, Liverpool	Prof Peter Davies
		Cumbria & Lancashire	16 April 2012	The Barn, Preston	Prof Peter Ormerod
		South Manchester	20 April 2012	Dalton Ellis Hall, Manchester	Prof Mark Woodhead
		North Manchester	11 May 2012	Holiday Inn Bolton	Dr Marko Petrovic
2	Oct to Dec 2011	Cheshire & Merseyside	10 July 2012	Liverpool Medical Institution	Prof Mark Woodhead
		Cumbria & Lancashire	15 August 2012	Brockholes Nature Reserve, Preston	Dr Peter Davies
		South Manchester	17 August 2012	Dalton Ellis Hall, Manchester	Prof Bertie Squire
		North Manchester	14 September 2012	Bolton Environmental Resource Centre	Prof Bertie Squire
3	Jan to March 2012	Cheshire & Merseyside	25 October 2012	Liverpool Medical Institution	Dr Alec Bonington
		Cumbria & Lancashire	20 November 2012	University of Central Lancashire	Prof Bertie Squire
		South Manchester	21 November 2012	Dalton Ellis Hall, Manchester	Prof Peter Davies
		North Manchester	14 September 2012	Bolton Environmental Resource Centre	Prof Mark Woodhead
4	April to June 2012	Cheshire & Merseyside	28 January 2013	Liverpool Medical Institution	Dr Paddy McMaster
		Cumbria & Lancashire	14 February 2013	Brockholes Nature Reserve	Prof Mark Woodhead
		South Manchester	8 February 2013	Dalton Ellis Hall, Manchester	Prof Bertie Squire
		North Manchester	21 February 2013	Red Hall Hotel, Bury	Prof Peter Ormerod

Table 15: Schedule of Meetings held in Year 1

Round	Cases Logged onto ETS	Footprint	Date of Meeting	Venue	Chair
5	July to Sept 2012	Cheshire & Merseyside	24 May 2013	Liverpool Medical Institution	Prof Mark Woodhead
		Cumbria & Lancashire	16 May 2013	Westmorland County Agricultural Centre	Dr Paddy McMaster
		South Manchester	6 June 2013	Dalton Ellis Hall, University of Manchester	Dr Alec Bonington
		North Manchester	9 May 2013	Holiday Inn Bolton	Prof Bertie Squire
6	Oct to Dec 2012	Cheshire & Merseyside	10 September 2013	Liverpool Medical Institution	Prof Peter Ormerod
		Cumbria & Lancashire	10 July 2013	Westleigh Conference Centre, Preston	Prof Bertie Squire
		South Manchester	7 September 2013	Dalton Ellis Hall, University of Manchester	Dr Paddy McMaster
		North Manchester	17 July 2013	Holiday Inn Bolton	Prof Peter Davies
7	Jan to March 2013	Cheshire & Merseyside	7 November 2013	Liverpool Medical Institution	Dr Paddy McMaster
		Cumbria & Lancashire	11 October 2013	Bailrigg Conference Centre, Lancaster University	Prof Mark Woodhead
		South Manchester	20 November 2013	Dalton Ellis Hall, University of Manchester	Dr Alec Bonington
		North Manchester	29 October 2013	Wigan Mercure Hotel	Prof Peter Ormerod
8	April to June 2013	Cheshire & Merseyside	6 February 2014	Liverpool Medical Institution	Dr Alec Bonington
		Cumbria & Lancashire	20 January 2014	Bailrigg Conference Centre, Lancaster University	Dr Paddy McMaster
		South Manchester	14 February 2014	Dalton Ellis Hall, University of Manchester	Prof Peter Davies
		North Manchester	16 January 2014	Bolton Holiday Inn	Prof Bertie Squire

Table 16: Schedule of Meetings held in Year 2

Appendix 4: Chairs

Chairs for Year 1 and 2

Professor Mark Woodhead	Honorary Clinical Professor Respiratory Medicine, Central Manchester Foundation Trust
Professor Bertie Squire	Infectious Disease Consultant, Liverpool School of Tropical Medicine
Professor Peter Ormerod	Chairman of the Joint TB Committee of the British Thoracic Society
Dr Paddy McMaster	Infectious Disease Consultant and Paediatrician, North Manchester General Hospital
Dr Alec Bonington	Consultant in Infectious Disease and Tropical Medicine, North Manchester General Hospital
Professor Peter Davies	Consultant Chest Physician, Liverpool Heart and Chest Hospital

Chair Specification

North West TB Regional Audit (Cohort Review)

Role Title:	Cohort Review Chair
Location:	Chairs are expected to travel across the region to the attend reviews.
Accountable To:	The Cohort Review Steering Group
Hours	Chairs are required to commit to chairing at least one review per year

Role Summary

Cohort Review is a systematic audit of the management of TB and aims to capture both quantitative data (through the project-specific data collection forms) and qualitative data (through narrative and discussions held at the reviews themselves). In the North West Reviews are held four times per year in each of the four footprints; Cumbria & Lancashire, Cheshire & Merseyside, North Manchester and South Manchester, which results in 16 reviews annually. The North West has around 800 cases of TB per year, so each Review covers around 50 cases.

The Cohort Review Chair is pivotal to ensuring that each review is a success. The Chair is responsible for:

- Liaising with the cohort review coordinator prior to the meeting
- Ensuring the meeting runs to time
- Establishing a supportive learning environment
- Presenting findings from the previous review and local updates
- Providing challenge and advice to case managers and TB clinicians
- Stimulate, where appropriate, case discussion
- Maintaining an overview of the key issues identified
- Summarising key findings to audience and contributing to the Round Summary produced by the NW TB Coordinator
- Contributing to the annual Cohort Review report

Person Specification	Essential
Personal qualities	
Commitment to team-working, and respect and consideration for the skills of others	x
Experience	
Experienced clinician involved in the management of TB cases	x
Previous participation in at least one Cohort Review	x
Skills	
Excellent communication skills	x
Effective interpersonal skills	x
Good time keeping skills	x
Skilled facilitator of group discussions	x
Knowledge	
High level of understanding of TB, epidemiology and statistics	x
Understanding of how NHS TB services are structured and operate	x
Up to date with the latest evidence base and guidance in relation to TB	x

Appendix 5: 2014 Data Collection Form (v13)

Regional TB Audit Presentation Form (v13)

1. Patient details

Date form completed:	Case manager: *«CaseManager»*	
Clinic: *«Hospital»*		
PHE Centre: *«HPU»*	PCT: *«PCT»*	
ETS no: *«Id»*	Date of notification: *«CaseReportDate»*	Patient occupation: *«Occupation»*
Age: *«Age»*	Sex: *«Sex»*	Ethnic group: *«EthnicGroup»*
UK born: *«UKBorn»*	Country of birth: *«BirthCountry»*	Entered UK (year): *«UKEntryYear»*
Referred to TB service by: Select response	Date 1st seen by team initiating treatment:	Date 1st seen by TB nurse:
Date treatment commenced: «StartOfTreatment»		

2. Clinical details

Site of disease: Click here to enter site of disease.	Pulmonary infection: *«SitePulmonary»*	Previous BCG: *«BcgVaccinated»*
Spontaneous sputum smear status: Select response	Type of sputum: Select response	Smear status (other than spontaneous sputum): Click here to enter smear status
CXR / chest CT at diagnosis: Select response	Culture at any site: Select response	Culture sensitivities: Select response
PCR resistance done: Select response	Histological diagnosis: ☐	Empirical treatment: ☐
HIV test offered: «HIVTesting»	Outcome of HIV test: Select response	Year of test:

3. Risk factors requiring Enhanced Case Management

Standardized Risk Assessment completed: ☐	Enhanced Case Management: Select response *(See guidance notes)*	
Problem alcohol use: *«AlcoholUse»*	Unstable housing: *«Homeless»*	Problem drug use: *«DrugUse»*
Previous TB diagnosis: *«PreviouslyDiagnosed»*	Imprisonment: *«Prison»*	Mental health: ☐
Clinically complex: ☐	MDR: ☐	Loaded onto BTS MDR website: ☐
Non-adherence: ☐	Gipsy / traveller: ☐	Hard to reach group: ☐
Language barrier: ☐	Child/adult protection issues: ☐	
Other: Click here to enter details.		

4. Treatment plan

Self administered treatment: ☐ *(Including treatment administered by parent/carer/family member)*		Treatment as inpatient: ☐
Weekly supervised: ☐	Tablet count: ☐	Urine test: ☐
DOT required: ☐	DOT from start of treatment: ☐	% doses observed:
DOT offered: ☐	If not from Rx start, DOT started:	% doses self-administered:
DOT refused: ☐	No. of weeks on DOT:	% doses missed:

5. Treatment outcome at time of cohort

Post-mortem diagnosis: «PostMortemDiagnosis»	Completed treatment: Select response (if did not, ➔)	Reason for non completion: Click here to enter details.
If still on TB medications: no. of completed weeks treatment	and likely to complete within Select response (time from treatment start date)	
Lost to follow up: ☐	If lost to FU, actions taken: Click here to enter details.	
Planned treatment out of country: ☐	Transferred out within UK: ☐	

6. Contact screening

DO NOT COMPLETE if this case has been identified through contact tracing, and contact tracing details are a duplication of data from the index case.

		Contacts screened by clinic		Contacts referred elsewhere		Notes from ETS:
Identified:		(adult)	(child)	(adult)	(child)	*«Comments»*
Assessment completed:		(adult)	(child)	(adult)	(child)	
Still under investigation:		(adult)	(child)	(adult)	(child)	
No. with active disease:		(adult)	(child)	(adult)	(child)	
No. with LTBI:		(adult)	(child)	(adult)	(child)	
No. started LTBI Rx:		(adult)	(child)	(adult)	(child)	
No. completed LTBI treatment:		(adult)	(child)	(adult)	(child)	
Discontinued LTBI treatment due to:	Adverse FX:	(adult)	(child)	(adult)	(child)	
	Death:	(adult)	(child)	(adult)	(child)	
	Moved:	(adult)	(child)	(adult)	(child)	
	Refused:	(adult)	(child)	(adult)	(child)	

If any contact was a previous TB case (adequately treated), record ETS numbers: Click here to enter details.

Is the patient part of a cluster? ☐	(if yes, ➔)	Cluster ID: Enter cluster ID.	
HPU incident meeting held? ☐	(if yes, ➔)	HPZone No: Enter HPZone number.	

Space for additional notes:

Click here to enter any further details.

Appendix 6: Attendance at Cohort

All health professionals that are involved in the treatment of TB are encouraged to attend cohort review.

At each meeting, primarily it is the TB Nurses who present the TB cases but it is expected that clinical colleagues are also present to explain treatment decisions taken and to support the Nurses presentation.

Public Health colleagues from local government (and PCTs as was) and Public Health England should also attend and contribute to case presentations where appropriate. CCDC's are encouraged to present an overview of a TB incident or Clusters as appropriate at each meeting.

Cohort Audit Footprint	**Round 1**	**Round 2**	**Round 3**	**Round 4**	**Round 5**	**Round 6**	**Round 7**	**Round 8**
Cheshire & Merseyside	17	12	11	15	19	14	18	19
South Manchester	21	14	17	12	14	15	14	17
Cumbria & Lancashire	25	12	16	21	16	14	18	20
North Manchester	22	14	14	18	16	19	20	21
Total	**85**	**52**	**58**	**66**	**65**	**62**	**70**	**77**

Table 17: Attendance figures for Rounds 1 to 8 by footprint

Appendix 7A: Greater Manchester Outcomes Summary

Round	1	2	3	4	5	6	7	8	**Total**
Outcome 1 - % Standardised Risk Assessment (SRA)	**88%**	**90%**	**96%**	**98%**	**100%**	**100%**	**99%**	**100%**	
Total No of cases with SRA completed	91	116	92	117	120	110	99	112	**857**
Total number of cases	103	129	96	120	120	110	100	112	**890**
Outcome 2 - % Cases 5 or more contacts (smear +ive)	**46%**	**48%**	**47%**	**50%**	**45%**	**38%**	**45%**	**69%**	
Total No of smear positive index cases with 5+ contacts	13	10	8	11	9	8	9	9	**77**
Total No of smear positive index cases	28	21	17	22	20	21	20	13	**162**
Outcome 3 - % Contacts assessed (of smear +ive cases)	**72%**	**69%**	**89%**	**89%**	**77%**	**90%**	**84%**	**95%**	
Total No of smear positive contacts assessed	125	184	157	93	123	113	249	112	**1156**
Total No of smear positive contacts	173	265	176	105	159	125	297	118	**1418**
Outcome 4 - % Child contacts assessed (all disease sites)	**97%**	**71%**	**93%**	**92%**	**97%**	**91%**	**88%**	**92%**	
Total No of Child contacts assessed	103	206	173	132	132	154	277	156	**1333**
Total No of child contacts	106	291	187	143	136	169	314	170	**1516**
Outcome 5 - % HIV offered	**76%**	**81%**	**89%**	**87%**	**84%**	**84%**	**91%**	**88%**	
Total No of cases HIV offered	78	105	85	104	101	92	91	99	**755**
Total number of cases	103	129	96	120	120	110	100	112	**890**
Outcome 6 - % Non DR cases treated within 1 year	**80%**	**86%**	**84%**	**87%**	**84%**	**90%**	**89%**	**89%**	
Total no of non drug resistant cases treated within a year	79	108	77	103	95	92	87	93	**734**
Total no of non drug resistant cases	99	125	92	118	113	102	98	105	**852**
Outcome 7 - % Lost to follow up (LTFU)	**4%**	**2%**	**6%**	**4%**	**3%**	**2%**	**3%**	**4%**	
Number of cases LTFU	4	2	6	5	4	2	3	4	**30**
Total number of cases	103	129	96	120	120	110	100	112	**890**
Outcome 8 - % Cases onto ETS within 5 working days					**73%**	**69%**	**90%**	**88%**	
No of cases reported within 5 working days					88	76	90	99	**353**
Total number of cases					120	110	100	112	**442**
Outcome 9 - % of cases categorised with ECM					**100%**	**100%**	**100%**	**100%**	
Total number of cases					121	114	102	114	**451**

Note: Outcomes 1,5,6,7 and 8 exclude post-mortem cases.

Appendix 7B: Cheshire Warrington & Wirral Outcomes Summary

Round	1	2	3	4	5	6	7	8	Total
Outcome 1 - % Standardised Risk Assessment (SRA)	**100%**	**83%**	**100%**	**100%**	**92%**	**100%**	**100%**	**95%**	
Total No of cases with SRA completed	9	5	8	13	12	6	11	21	**85**
Total number of cases	9	6	8	13	13	6	11	22	**88**
Outcome 2 - % Cases 5 or more contacts (Smear +ive)	**100%**	**100%**	**0%**	**100%**	**67%**	**100%**	**67%**	**100%**	
Total No of smear positive index cases with 5+ contacts	1	1	0	3	2	2	2	1	**12**
Total No of smear positive index cases	1	1	1	3	3	2	3	1	**15**
Outcome 3 - % Contacts assessed (of smear +ive cases)	**88%**	**100%**	**0%**	**84%**	**89%**	**100%**	**83%**	**83%**	
Total No of smear positive contacts assessed	14	10	0	52	17	13	10	5	**121**
Total No of smear positive contacts	16	10	0	62	19	13	12	6	**138**
Outcome 4 - % Child contacts assessed (all disease sites)	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**90%**	**85%**	
Total No of Child contacts assessed	5	3	5	28	11	4	9	17	**82**
Total No of child contacts	5	3	5	28	11	4	10	20	**86**
Outcome 5 - % HIV offered	**67%**	**83%**	**88%**	**85%**	**69%**	**83%**	**82%**	**82%**	
Total No of cases HIV offered	6	5	7	11	9	5	9	18	**70**
Total number of cases	9	6	8	13	13	6	11	22	**88**
Outcome 6 - % Non DR cases treated within 1 year	**100%**	**67%**	**88%**	**92%**	**85%**	**100%**	**90%**	**76%**	
Total no of non drug resistant cases treated within a year	8	4	7	11	11	5	9	16	**71**
Total no of non drug resistant cases	8	6	8	12	13	5	10	21	**83**
Outcome 7 - % Lost to follow up (LTFU)	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**4%**	
Number of cases LTFU	0	0	0	0	0	0	0	1	**1**
Total number of cases	9	6	8	13	13	6	11	22	**88**
Outcome 8 - % Cases onto ETS within 5 working days					**31%**	**17%**	**64%**	**50%**	
No of cases reported within 5 working days					4	1	7	11	**23**
Total number of cases					13	6	11	22	**52**
Outcome 9 - % of cases categorised with ECM					**100%**	**100%**	**100%**	**100%**	
Total number of cases					13	6	11	23	**53**

Note: Outcomes 1,5,6,7 and 8 exclude post-mortem cases.

Appendix 7C: Merseyside Outcomes Summary

Round	1	2	3	4	5	6	7	8	Total
Outcome 1 - % Standardised Risk Assessment (SRA)	**90%**	**100%**	**86%**	**100%**	**100%**	**100%**	**100%**	**94%**	
Total No of cases with SRA completed	9	13	19	19	12	19	15	17	**123**
Total number of cases	10	13	22	19	12	19	15	18	**128**
Outcome 2 - % Cases 5 or more contacts (Smear +ive)	**0%**	**50%**	**67%**	**57%**	**67%**	**40%**	**50%**	**50%**	
Total No of smear positive index cases with 5+ contacts	0	2	4	4	2	2	2	2	**18**
Total No of smear positive index cases	1	4	6	7	3	5	4	4	**34**
Outcome 3 - % Contacts assessed (of smear +ive cases)	**100%**	**88%**	**90%**	**88%**	**88%**	**70%**	**79%**	**78%**	
Total No of smear positive contacts assessed	4	15	37	50	21	14	15	35	**191**
Total No of smear positive contacts	4	17	41	57	24	20	19	45	**227**
Outcome 4 - % Child contacts assessed (all disease sites)	**100%**	**100%**	**100%**	**96%**	**100%**	**100%**	**100%**	**100%**	
Total No of Child contacts assessed	5	12	13	23	6	7	11	15	**92**
Total No of child contacts	5	12	13	24	6	7	11	15	**93**
Outcome 5 - % HIV offered	**80%**	**100%**	**73%**	**84%**	**92%**	**95%**	**100%**	**83%**	
Total No of cases HIV offered	8	13	16	16	11	18	15	15	**112**
Total number of cases	10	13	22	19	12	19	15	18	**128**
Outcome 6 - % Non DR cases treated within 1 year	**89%**	**100%**	**76%**	**95%**	**92%**	**74%**	**100%**	**47%**	
Total no of non drug resistant cases treated within a year	8	12	16	18	11	14	15	8	**102**
Total no of non drug resistant cases	9	12	21	19	12	19	15	17	**124**
Outcome 7 - % Lost to follow up (LTFU)	**0%**	**0%**	**13%**	**0%**	**0%**	**5%**	**0%**	**6%**	
Number of cases LTFU	0	0	3	0	0	1	0	1	**5**
Total number of cases	10	13	22	19	12	19	15	18	**128**
Outcome 8 - % Cases onto ETS within 5 working days					**31%**	**17%**	**64%**	**50%**	
No of cases reported within 5 working days					4	1	7	11	**23**
Total number of cases					13	6	11	22	**52**
Outcome 9 - % of cases categorised with ECM					**100%**	**100%**	**100%**	**100%**	
Total number of cases					13	6	11	23	**53**

Note: Outcomes 1,5,6,7 and 8 exclude post-mortem cases.

Appendix 7D: Lancashire Outcomes Summary

Round	1	2	3	4	5	6	7	8	Total
Outcome 1 - % Standardised Risk Assessment (SRA)	**97%**	**87%**	**95%**	**94%**	**97%**	**100%**	**100%**	**97%**	
Total No of cases with SRA completed	35	26	41	45	31	52	28	57	**315**
Total number of cases	36	30	43	48	32	52	28	59	**328**
Outcome 2 - % Cases 5 or more contacts (Smear +ive)	**100%**	**67%**	**82%**	**71%**	**75%**	**100%**	**33%**	**83%**	
Total No of smear positive index cases with 5+ contacts	4	6	9	5	6	6	2	15	**53**
Total No of smear positive index cases	4	9	11	7	8	6	6	18	**69**
Outcome 3 - % Contacts assessed (of smear +ive cases)	**92%**	**79%**	**90%**	**90%**	**100%**	**94%**	**70%**	**80%**	
Total No of smear positive contacts assessed	36	77	472	119	122	105	16	271	**1218**
Total No of smear positive contacts	39	97	523	132	122	112	23	337	**1385**
Outcome 4 - % Child contacts assessed (all disease sites)	**96%**	**79%**	**95%**	**94%**	**100%**	**97%**	**100%**	**76%**	
Total No of Child contacts assessed	50	42	144	91	30	172	22	155	**706**
Total No of child contacts	52	53	152	97	30	177	22	204	**787**
Outcome 5 - % HIV offered	**19%**	**27%**	**9%**	**15%**	**38%**	**69%**	**64%**	**71%**	
Total No of cases HIV offered	7	8	4	7	12	36	18	42	**134**
Total number of cases	36	30	43	48	32	52	28	59	**328**
Outcome 6 - % Non DR cases treated within 1 year	**86%**	**81%**	**84%**	**96%**	**87%**	**88%**	**86%**	**91%**	
Total no of non drug resistant cases treated within a year	30	21	36	46	26	43	24	49	**275**
Total no of non drug resistant cases	35	26	43	48	30	49	28	54	**313**
Outcome 7 - % Lost to follow up (LTFU)	**6%**	**3%**	**2%**	**0%**	**3%**	**0%**	**4%**	**3%**	
Number of cases LTFU	2	1	1	0	1	0	1	2	**8**
Total number of cases	36	30	43	48	32	52	28	59	**328**
Outcome 8 - % Cases onto ETS within 5 working days					**56%**	**63%**	**68%**	**76%**	
No of cases reported within 5 working days					18	33	19	45	**115**
Total number of cases					32	52	28	59	**171**
Outcome 9 - % of cases categorised with ECM					**100%**	**100%**	**100%**	**100%**	
Total number of cases					32	52	28	60	**172**

Note: Outcomes 1,5,6,7 and 8 exclude post-mortem cases.

Appendix 7E: Cumbria Outcomes Summary

Round	1	2	3	4	5	6	7	8	Total
Outcome 1 - % Standardised Risk Assessment (SRA)	**100%**	**100%**	**100%**	**88%**	**100%**	**100%**	**100%**	**100%**	
Total No of cases with SRA completed	7	3	14	7	10	4	6	8	**59**
Total number of cases	7	3	14	8	10	4	6	8	**60**
Outcome 2 - % Cases 5 or more contacts (Smear +ive)	**100%**	**0%**	**60%**	**100%**	**0%**	**50%**	**50%**	**25%**	
Total No of smear positive index cases with 5+ contacts	2	0	3	1	0	1	1	1	**9**
Total No of smear positive index cases	2	1	5	1	2	2	2	4	**19**
Outcome 3 - % Contacts assessed (of smear +ive cases)	**100%**	**0%**	**93%**	**91%**	**100%**	**88%**	**100%**	**73%**	
Total No of smear positive contacts assessed	31	0	26	10	4	15	10	11	**107**
Total No of smear positive contacts	31	1	28	11	4	17	10	15	**117**
Outcome 4 - % Child contacts assessed (all disease sites)	**100%**	**100%**	**88%**	**100%**	**100%**	**100%**	**100%**	**89%**	
Total No of Child contacts assessed	8	7	15	9	13	7	8	8	**75**
Total No of child contacts	8	7	17	9	13	7	8	9	**78**
Outcome 5 - % HIV offered	**0%**	**33%**	**14%**	**63%**	**10%**	**75%**	**17%**	**88%**	
Total No of cases HIV offered	0	1	2	5	1	3	1	7	**20**
Total number of cases	7	3	14	8	10	4	6	8	**60**
Outcome 6 - % Non DR cases treated within 1 year	**100%**	**100%**	**86%**	**86%**	**100%**	**75%**	**100%**	**100%**	
Total no of non drug resistant cases treated	7	3	12	6	10	3	5	8	**54**
Total no of non drug resistant cases	7	3	14	7	10	4	5	8	**58**
Outcome 7 - % Lost to follow up (LTFU)	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	
Number of cases LTFU	0	0	0	0	0	0	0	0	**0**
Total number of cases	7	3	14	8	10	4	6	8	**60**
Outcome 8 - % Cases onto ETS within 5 working days					**20%**	**25%**	**17%**	**25%**	
No of cases reported within 5 working days					2	1	1	2	**6**
Total number of cases					10	4	6	8	**28**
Outcome 9 - % of cases categorised with ECM					**100%**	**100%**	**100%**	**100%**	
Total number of cases					10	4	6	8	**28**

Note: Outcomes 1,5,6,7 and 8 exclude post-mortem cases.

Appendix 7F – North West Outcomes Summary

Round	1	2	3	4	5	6	7	8	Total
Outcome 1 - % Standardised Risk Assessment (SRA)	**92%**	**89%**	**95%**	**97%**	**99%**	**100%**	**99%**	**98%**	
Total No of cases with SRA completed	151	163	174	201	185	191	159	215	**1439**
Total number of cases	165	183	183	208	187	191	160	219	**1496**
Outcome 2 - % Cases 5 or more contacts (Smear +ive)	**56%**	**53%**	**60%**	**60%**	**53%**	**53%**	**46%**	**70%**	
Total No of smear positive index cases with 5+	20	19	24	24	19	19	16	28	**169**
Total No of smear positive index cases	36	36	40	40	36	36	35	40	**299**
Outcome 3 - % Contacts assessed (of smear +ive cases)	**80%**	**73%**	**90%**	**88%**	**88%**	**91%**	**83%**	**83%**	
Total No of smear positive contacts assessed	210	286	692	324	287	260	300	434	**2793**
Total No of smear positive contacts	263	390	768	367	328	287	361	521	**3285**
Outcome 4 - % Child contacts assessed (all disease sites)	**97%**	**74%**	**94%**	**94%**	**98%**	**95%**	**90%**	**84%**	
Total No of Child contacts assessed	171	270	350	283	192	344	327	351	**2288**
Total No of child contacts	176	366	374	301	195	364	365	418	**2559**
Outcome 5 - % HIV offered	**60%**	**72%**	**62%**	**69%**	**72%**	**81%**	**84%**	**83%**	
Total No of cases HIV offered	99	132	114	143	134	154	134	181	**1091**
Total number of cases	165	183	183	208	187	191	160	219	**1496**
Outcome 6 - % Non DR cases treated within 1 year	**84%**	**85%**	**83%**	**90%**	**86%**	**88%**	**90%**	**85%**	
Total no of non drug resistant cases treated	132	148	148	184	153	157	140	174	**1236**
Total no of non drug resistant cases	158	174	178	204	178	179	156	205	**1432**
Outcome 7 - % Lost to follow up (LTFU)	**4%**	**2%**	**5%**	**2%**	**3%**	**2%**	**2%**	**4%**	
Number of cases LTFU	6	3	10	5	5	3	4	8	**44**
Total number of cases	165	183	183	208	187	191	160	219	**1496**
Outcome 8 - % Cases onto ETS within 5 working days					**63%**	**64%**	**80%**	**78%**	
No of cases reported within 5 working days					117	123	128	171	**539**
Total number of cases					187	191	160	219	**757**
Outcome 9 - % of cases categorised with ECM					**100%**	**100%**	**100%**	**100%**	
Total number of cases					188	195	162	223	**768**

Note: Outcomes 1,5,6,7 and 8 exclude post-mortem cases.

Appendix 8: Enhanced Case Management

The RCN[5] define standard case management as care which is:

> *"co-ordinated by a named case manager and is appropriate for any non-clinically complex patient who is able to self-medicate and have monthly follow-up in a hospital or community setting"*

Typically these patients would have:

- No language barriers
- No stigma related issues
- The ability to take their own medications – physically able and no CNS impairment
- No housing or finance issues impacting on their treatment
- No factors affected by their age
- No contact tracing requirements / all adults in the same household
- Positive rifampicin or Isoscreen at reviews
- Correct tablet count at reviews

Enhanced care management is defined as care which is:

> *"co-ordinated by the named case manager working alongside a specialist multidisciplinary TB team able to provide expert clinical and psychosocial care and to engage effectively with the client group in the community"*

Every case of TB is different and it is possible that two patients with the same feature could be graded differently simply because of the detailed features of the case. It is also likely that some patients will have a combination of many of the issues listed in table 17. The ECM grading is down to the nurse's judgement, and is not a precise science.

This system of grading ECM cases was very well received by the TB Nurses and widely held to be easy to use and that it helped them to quantify the input required for an ECM case.

As far as we are aware, this is the first time that a system has been devised to more accurately quantify the input required for ECM cases. It should be stressed that this is not a precise science.

[5] RCN. Tuberculosis case management and cohort review. 2012

Level 1	Level 2	Level 3
• Fortnightly visits • Interpreter for first visit but some English • Elderly - monitor side effects • Children - concordance of child and parent / adult • Requires medications from GP / community pharmacy due to blister packs - to check correct doses • Requires signposting for benefits / financial issues • Contact tracing from various areas / setting i.e. patient out of area, workplace, community group settings • Difficult access. E.g. no front door bell, >1 address, problems getting time off work/college, those who refuse home visits etc. • Stigma that can be dealt with through 1:1 education • Complex meds / co-infection meds i.e. TB meds given when on ARV's already • Disease site e.g. smear positive pulmonary or central nervous system disease	• Weekly visits • Having complex side effects so requires regular LFT etc. • Needs more regular prompting with medications – blister packs / Isoscreen regularly / tablet counts • Financial difficulties prevent treatment compliance i.e. attending clinic apt / poor nutrition / heating • Stigma that requires more formal education i.e. community centres / work places • Transmission within contacts / children who are contacts • Language barriers throughout treatment requiring easily accessible interpreter either face to face or phone interpretation at each visit • Alcohol and/or drug dependency without LFT derangement • Difficult to reach – DNA at clinics / home for reviews • HIV and TB co-infection starting both ARV and TB meds at the same time • Single drug resistance	• Difficult language to access throughout treatment • DOT • Homelessness or housing issues due to finance • Illegal immigrants – difficult to access funding / benefits • Drug resistance • More than one drug resistance • Needs reintroduction of medications i.e. deranged LFT's • Complex contact tracing – transmission within children / vulnerable groups / extensive transmission • Involvement of HPA for workplace / community screening • Potentially dangerous patients where more than one person is required to visit • Children who DNA and social service involvement is required • Difficult to reach – consistent DNA at clinics / home for reviews

Table 18: Features that might guide the apportioning of ECM Levels 1 to 3

Appendix 9

By email

20 December 2012

To: North West Trusts

- Chief Executive
- Medical Director
- Director of Nursing
- cc: TB nurses and clinicians

Dear Colleague

Statutory notification of cases of Tuberculosis

You will be aware that in April 2012 we introduced the North West wide Cohort Review audit as a response to the significant increase in the number of TB cases we have seen over recent years. We would like to thank you for the hard work and commitment that your staff have shown towards this process and we will share with you the first full year findings in due course.

However, the audit has identified a pressing issue regarding the statutory reporting of TB cases, upon which we are seeking immediate action. There appears to be a wide variation in the time taken to report TB cases and some Trusts are still reporting on paper forms, rather than using the Electronic Surveillance system (ETS) which was implemented some time ago. These delays have implications for the Public Health management of the disease, as they mean that the complete epidemiological picture is not always available for analysis and investigation.

We are therefore writing to ask you to ensure that **all TB cases are notified within 5 working days of the decision to start treatment** and also to ensure that **all reporting is made via the electronic system (ETS) from the 1st April 2013**. No paper based notifications will be accepted after this date.

Once again, we would like to thank you for your support with this important matter.

Yours sincerely

Dr Ann Hoskins

Interim Regional Director of Public Health

Professor Qutub Syed

NW Regional Director, HPA

Appendix 10: Serious Incident Protocol

Protocol for Dealing with Serious Risks to Patient Safety/Quality identified through Cohort Audit

Background

Cohort Audit is a peer lead approach to improving the quality of TB services and prevention and control activities. It is a supportive process, which aims to encourage learning and the sharing of good practice. On rare occasions a serious or immediate risk to patient safety or quality is identified though Cohort Audit. This protocol sets out how such incidences are dealt with.

Dealing with serious or immediate risk

If a serious or immediate risk to patient safety and/or quality is identified through case review at Cohort Audit, it is the responsibility of the Chair to instigate a series of immediate follow up actions to ensure that that issue is being addressed though the appropriate channels. The chair will be supported in this task by the TB Cohort Coordinator.

Individuals should be encouraged to report any serious incidents through their Trust's own incident reporting systems if they have not already done so.

Examples of immediate and serious risks to patient safety/quality include:

- inadequate resources are in place for the TB Nurse to fulfil DOT/appropriate treatment regime
- there has been a breach in the therapeutic relationship between the TB Nurse and patient leaving both parties at risk (For example where a patient has been abusive)

Issues raised at Cohort Audit which pose no immediate risk to patient safety/quality are collated and presented to the North West TB Cohort Audit Steering Group, for inclusion in their work plan, as appropriate. If risks are identified that cannot be taken forward via the Steering Group, they are referred to the North West TB Summit.

Actions to be taken:

If the Case Consultant is present at the Cohort Meeting:

1. The Chair should record the detail of the identified risk/issue and agree a set of remedial actions/next steps with the Consultant responsible for the case[6] . A written record of this should then be shared with all concerned parties including the TB Cohort Audit Co-ordinator.
2. The Chair should arrange a follow-up appointment/telephone call with the Consultant (and others as appropriate[7]) to discuss actions taken and satisfy themselves that the matter is being addressed within the TB Service concerned/is resolved
3. The Chair should ensure the TB Cohort Audit Co-ordinator has a full written record of the concerns raised, actions taken and a record of those people involved.
4. The TB Cohort Audit Co-ordinator should report the incident to the next TB Cohort Audit Steering Group Meeting.

If the Case Consultant is not present at the Cohort Meeting:

1. The Chair should liaise with the TB Cohort Co-ordinator and TB Specialist Nurse presenting the case to ensure they have a record of;
    a. the contact details for the Consultant who managed the case
    b. the case ETS number
    c. details of the identified risk/issue

2. The Chair (with assistance of Co-ordinator if requested) will set up an urgent telephone meeting with the appropriate individuals to discuss the concerns raised. This would normally include as a minimum the Case Consultant, TB Specialist Nurse and the Chair.

    Dependant on the nature of the issue, it may also be appropriate to involve other parties in this phone call, such as;

    a. Public Health England CCDC
    b. TB Service Lead/Senior representative
    c. Local Director of Public Health (or Deputy)
    d. Clinical Member of the NW TB Cohort Steering Group (Professor Mark Woodhead, Professor Bertie Squire, Dr Paddy McMaster)
    e. NW TB Cohort Audit Co-ordinator
    f. CCG lead for Quality/Patient Safety

3. The Chair should ensure that all parties are clear on the reasons for the concern and that actions/next steps are agreed to address the issue. The Chair should initially outline the cohort process if any parties are unclear.
4. The Chair should circulate a written record of the discussion and any agreed actions to the parties concerned (this may be an email).

[6] This should happen in the course of the case discussion or at the end of the meeting as appropriate.
[7] This might include the appropriate CCDC, TB Service Lead, TB Specialist Nurse who presented the case, clinical member of the TB Cohort Audit Steering Group.

5. The Chair should arrange a follow-up appointment/telephone call with the Consultant (or others as appropriate[8]) to discuss actions taken and satisfy themselves that the matter is being addressed within the TB Service concerned/is resolved.
6. The Chair should ensure the TB Cohort Audit Co-ordinator has a full written record of the concerns raised, actions taken and a record of those people involved.
7. The TB Cohort Audit Co-ordinator should report the incident to the next TB Cohort Audit Steering Group Meeting.

If concerns remain

If the above discussions fail to lead to the risk/quality issue being addressed then the Chair of the Cohort Audit should contact the Chair of the Steering group for advice. If further action is required the Chair of the Steering Group and the Chair of the Summit will raise the matter with the commissioner of the relevant service.

Governance arrangements

The TB Cohort Co-ordinator is responsible for maintaining a record, of all incidences when this protocol is activated. The interventions undertaken and the outcome achieved will be anonymised and reported to the North West Cohort Review Steering Group each quarter.

An anonymised report of the times that risks to patient safety/quality have been identified, the types of incident and the learning will be shared publically in the annual report of the Cohort Audit Steering Group.

[8] This might include the appropriate CCDC, TB Service Lead, TB Specialist Nurse who presented the case, clinical member of the TB Cohort Audit Steering Group.

Flow Chart Summary of the Serious Incident Protocol

Actions

- **Chair:** **Records** the detail of identifed risk and parties involved.
- **Chair:** **Agrees remedial actions/next steps**. If the case Consultant is not present, a conference call should take place asap after the audit meeting.
- **Chair:** S**hares a written record** with all concerned parties including the TB Cohort Co-ordinator

Follow Up

- **Chair:** **Reviews** actions taken, at an appropriate time, to satisfy themselves the issue has been addressed.

Reporting

- **Chair:** **Provides a written report** of the issue, actions taken and outcome to the TB Co-ordinator
- **TB Co-Ordinator:** **Reports** the incident to the next TB Cohort Audit Steering Group Meeting.
- **TB Co-Ordinator:** Provides a summary of the number and type of incidents raised for the annual report.

If Concerns Remain

- **Chair:** To contact the Chair of the Steering Group for advice. If further action is required the Chair of the Steering Group and the Chair of the NW TB Summit will raise the matter with the commissioner of the relevant service.

Authors

This report was produced by the North West TB Cohort Audit Steering Group:

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Want to know more about TB in the NW?

North West TB Cohort Audit has a web presence: http://tbsummit.wordpress.com/

Come to one of our Cohort Audit meetings – Contact Carolyn.wake@nhs.net if you wish to attend – dates are available on the website above.

Attend the annual NW TB Conference: Details of the 2014 Conference to be held in Manchester and how to book a place are available on the website above. Presentations from the 2013 Conference held in Liverpool are also available on the website.

PHE publish an annual NW TB Surveillance Report on TB incidence and can be referred to for more in-depth analysis: Tuberculosis in the UK - 2013 Report

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