NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

Health and social care directorate

Quality standards and indicators

Briefing paper

Quality standard topic: Tuberculosis

Output: Prioritised quality improvement areas for development.

Date of Quality Standards Advisory Committee meeting: 05 May 2016

Contents

1 Introduction

This briefing paper presents a structured overview of potential quality improvement areas for tuberculosis. It provides the Committee with a basis for discussing and prioritising quality improvement areas for development into draft quality statements and measures for public consultation.

1.1 Structure

This briefing paper includes a brief description of the topic, a summary of each of the suggested quality improvement areas and supporting information.

If relevant, recommendations selected from the key development source below are included to help the Committee in considering potential statements and measures.

1.2 Development source

The key development source(s) referenced in this briefing paper is:

Tuberculosis NICE guideline 33 (2016)

NICE guideline NG33 is an update of NICE guideline CG117 (published March 2011) and replaces it. It also incorporates and adapts NICE guideline PH37 (published March 2012).

2 Overview

2.1 Focus of quality standard

This quality standard will cover preventing, identifying and managing latent and active tuberculosis (TB) in children, young people and adults.

2.2 Definition

TB is a curable infectious disease caused by a type of bacterium called Mycobacterium tuberculosis ('M. tuberculosis' or 'M.Tb'), or other bacterium in the M. tuberculosis complex (that is, M. bovis or M. africanum). It is spread by droplets containing the bacteria being coughed out by someone with infectious TB, and then being inhaled by other people.

The initial infection clears in over 80% of people but, in a few cases, a defensive barrier is built round the infection and the TB bacteria lie dormant. This is called latent TB; the person is not ill and is not infectious. If the immune system fails to build the defensive barrier, or the barrier fails later, latent TB can spread in the lung

(pulmonary TB) or develop in the other parts of the body it has spread to (extrapulmonary TB). Only a small proportion of people with latent TB will develop symptoms ('active TB').

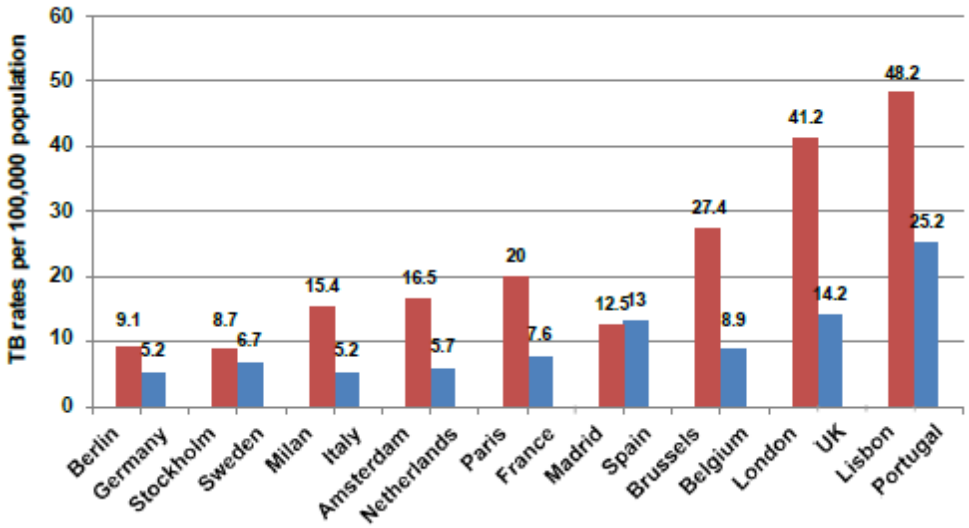
Not all forms of tuberculosis are infectious. Those with TB in organs other than the lungs are not infectious to others, nor are people with just latent tuberculosis. Some people with pulmonary tuberculosis are infectious, particularly those with bacteria which can be seen on simple microscope examination of the sputum, who are termed ‘smear positive’. The risk is greatest in those with prolonged, close household exposure to a person with infectious TB.

2.3 Incidence and prevalence

TB incidence in the UK has increased since the early 1990s, but has remained relatively stable since 2005. Public Health England’s (2015) Reports of cases of tuberculosis to the national Enhanced Tuberculosis Surveillance System highlighted that in 2014 there were 6,520 new cases of TB recorded in England. The Collaborative TB Strategy for England, 2015-2020 reports that nearly three quarters of all TB cases in England occur in those born abroad, mainly in high TB burden countries, and most of these cases (85%) occur among settled migrants who have been in the country for more than two years, rather than in new entrants[1]. Although there has been a small decline in incidence in the past two years, it is too early to tell whether this is the start of a downward trend.[2] Despite this, it remains high compared with many other western European countries.

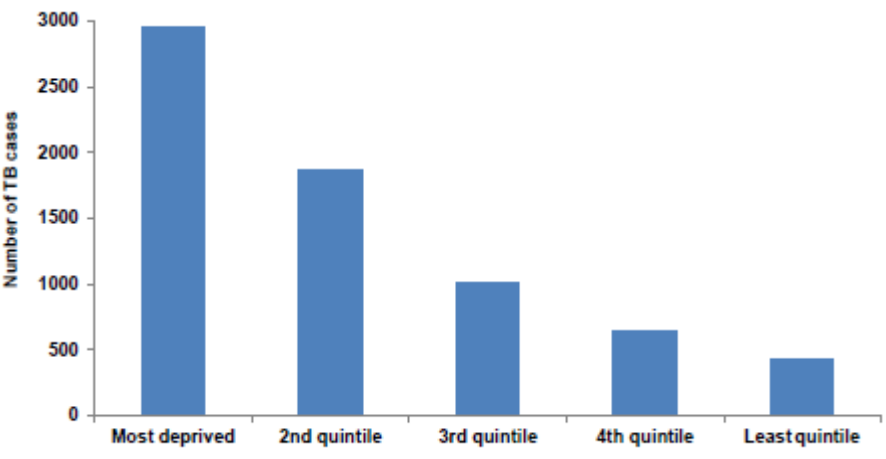
[1] Public Health England in partnership with NHS England (2015) Collaborative TB Strategy for England, 2015-2020.
[2] Public Health England in partnership with NHS England (2015) Collaborative TB Strategy for England, 2015-2020.

Figure 1: Comparison of TB rates per 100,000 population in Western European countries and cities[3] (2012)



Cases tend to cluster in urban areas where populations of at-risk groups are high. These include areas with many people born in countries with a high incidence of TB, areas with a high level of homelessness, poor housing or poverty, and areas with high rates of problem drug use.

Figure 2: Number of TB case reports by deprivation quintile of area of residence (IMD[4] 2010), UK, 2013



[3] Public Health England in partnership with NHS England (2015) Tuberculosis (TB): collaborative strategy for England

[4] Index of Multiple Deprivation

While the majority of cases are due to reactivation of latent infection acquired some years before, transmission of TB continues to occur, leading to spread of infection and outbreaks[5].

Many cases of TB can be prevented by public health measures and, when clinical disease does occur, most people can be cured if treated properly. Taking medication in the wrong dose or combination, irregularly or for too short a time can lead to drug resistance. Drug-resistant strains of TB are much harder to treat and significantly increase a person's risk of long-term complications or death. If left untreated, 1 person with active pulmonary TB may infect as many as 10 to 15 people every year. It is also possible to catch TB a second time, unlike some other infectious diseases.

Drug-resistant TB is an increasing problem in England with numbers of cases of MDR TB increasing from 46 (1.2% of cases) in 2004 to 68 (1.6% of cases) in 2013. The increasing numbers of drug- resistant cases present a particular challenge; they require longer and more complex treatment regimens, which are associated with significantly increased side effects and treatment costs, and poorer outcomes[6].

TB is a notifiable disease, meaning that clinicians have a statutory duty to notify local authorities or a local Public Health England centre of suspected cases, and efforts have been made to strengthen services and ensure clear lines of accountability and responsibility.

There is a risk that the current situation in the UK could worsen if there is a failure to prevent, diagnose and adequately treat TB cases leading to development of drug resistance, onward transmission and TB outbreaks, including outbreaks of MDR-TB[7].

2.4 Management

As TB can affect many sites in the body, there can be a wide range of symptoms, some of which are not specific and may delay diagnosis.

Typical symptoms of pulmonary TB include chronic cough, weight loss, intermittent fever, night sweats and coughing blood. TB in parts other than the lungs has symptoms which depend on the site, and may be accompanied by intermittent fever or weight loss. In young children, particularly those aged younger than 12 months, a failure to gain weight or grow at a ‘normal’ rate are more common than weight loss. TB is a possible diagnosis to be considered in anyone with intermittent fever, weight loss and other unexplained symptoms. Latent tuberculosis without disease, however,

[5] Public Health England in partnership with NHS England (2015) Collaborative TB Strategy for England, 2015-2020.
[6] Public Health England in partnership with NHS England (2015) Collaborative TB Strategy for England, 2015-2020.
[7] Public Health England in partnership with NHS England (2015) Collaborative TB Strategy for England, 2015-2020.

has no symptoms. Mantoux tests and interferon-gamma release assay tests (IGRAs) can show if someone has been exposed to TB and may have latent infection.

TB is diagnosed in a number of ways. Definite diagnosis is achieved by culturing the TB bacterium from sputum or other samples. This not only confirms the diagnosis, but also shows which of the TB drugs the bacterium is sensitive to. Tissue samples from biopsies may show changes that suggest TB, as do certain X-ray changes, particularly on chest X- rays.

TB is completely curable if the correct drugs are taken for the correct length of time. TB bacteria grow very slowly and divide only occasionally when the antibiotics start to kill them, so treatment usually has to be continued for six months to ensure all active and dormant bacteria are killed and the person with TB is cured.

Contact tracing involves identifying people who may have come into contact with a person with infectious TB and assessing them for risk of significant exposure to TB. The aim is to find associated cases, to detect people with latent TB and to identify those not infected but for whom BCG vaccination might be appropriate.

It has been suggested that contact tracing has the potential to improve early diagnosis and prevent further transmission[8]. Consequently, contact tracing is an established strategy to find and treat active and latent TB cases.

[8] Public Health England in partnership with NHS England (2015) Collaborative TB Strategy for England, 2015-2020 .

2.5 National Outcome Frameworks

Tables 1–2 show the outcomes, overarching indicators and improvement areas from the frameworks that the quality standard could contribute to achieving.

Table 1 NHS Outcomes Framework 2015–16

Domain	Overarching indicators and improvement areas
1 Preventing people from dying prematurely	***Overarching indicators*** 1a Potential Years of Life Lost (PYLL) from causes considered amenable to healthcare i Adults ii Children and young people 1b Life expectancy at 75 i Males ii Females 1c Neonatal mortality and stillbirths ***Improvement areas*** **Reducing premature mortality from the major causes of death** 1.1 Under 75 mortality rate from cardiovascular disease* 1.2 Under 75 mortality rate from respiratory disease* 1.3 Under 75 mortality rate from liver disease* **Reducing mortality in children** 1.6 i Infant mortality* ii Neonatal mortality and stillbirths
4 Ensuring that people have a positive experience of care	***Overarching indicators*** 4b Patient experience of hospital care 4c *Friends and family test* *4d Patient experience characterised as poor or worse* *ii Hospital care* ***Improvement areas*** **Improving people's experience of outpatient care** 4.1 Patient experience of outpatient services **Improving hospitals' responsiveness to personal needs** 4.2 Responsiveness to inpatients' personal needs **Improving children and young people's experience of healthcare** *4.8 Children and young people's experience of inpatient services* **Improving people's experience of integrated care** *4.9 People's experience of integrated care***
5 Treating and caring for people in a safe environment and protecting them from avoidable harm	***Overarching indicators*** *5a Deaths attributable to problems in healthcare* *5b Severe harm attributable to problems in healthcare* ***Improvement areas***

	Improving the culture of safety reporting 5.6 Patient safety incidents reported
Alignment with Adult Social Care Outcomes Framework and/or Public Health Outcomes Framework * Indicator is shared ** Indicator is complementary Indicators in italics in development	

Table 2 Public health outcomes framework for England, 2013–2016

Domain	**Objectives and indicators**
3 Health protection	***Objective*** The population's health is protected from major incidents and other threats, whilst reducing health inequalities ***Indicators*** 3.3 Population vaccination coverage 3.4 People presenting with HIV at a late stage of infection 3.5 Treatment completion for TB 3.7 Comprehensive, agreed inter-agency plans for responding to public health incidents
4 Healthcare public health and preventing premature mortality	***Objective*** Reduced numbers of people living with preventable ill health and people dying prematurely, whilst reducing the gap between communities ***Indicators*** 4.1 Infant mortality* 4.3 Mortality rate from causes considered preventable** 4.7 Under 75 mortality rate from respiratory diseases* 4.8 Mortality rate from communicable diseases
Alignment with Adult Social Care Outcomes Framework and/or NHS Outcomes Framework * Indicator is shared ** Indicator is complementary	

3 Summary of suggestions

3.1 Responses

In total 17 stakeholders responded to the 2-week engagement exercise 08/03/16-22/03/16.

Table 3 Summary of suggested quality improvement areas

Stakeholders were asked to suggest up to 5 areas for quality improvement. Specialist committee members were also invited to provide suggestions. The responses have been merged and summarised in table 3 for further consideration by the Committee.

Full details of all the suggestions provided are given in appendix 3 for information.

Suggested area for improvement	Stakeholders
Prevention • Raising awareness amongst hard to reach groups	BTS, RCP, SCMx2, TBA
Latent TB • Diagnosing latent TB in new entrants • Testing for TB in people who are HIV positive • Latent TB treatment up to the age of 65 years	BTS, RCP, RCPCH, SCMx3
Active TB • Rapid access to diagnostics • Diagnosing TB in children • Sputum testing at 2 months • HIV testing for people with active TB	BHIVA, BTS, RCP, RCPH, SCMX7
Drug resistant TB • Use of rapid diagnostic nucleic acid amplification tests (NAATs) for multi-drug resistant TB • Isolation of drug resistant cases • Management of patients with mono-drug resistant TB • Review of patients with multidrug- resistant TB by expert centres	BTS, RCP, SCMx3
Case finding • Case finding in people using homeless or substance misuse services	SCMx3
Adherence, treatment completion and follow-up • Enhanced case management and directly observed therapy (DOT) • Improved treatment completion rates for under-served groups	BTS, RCP, SCMx5

Service organisation • Workforce planning • TB service specifications • Cohort review • Organisation of TB services for children • Partnership working with third sector stakeholders • Accommodation during treatment	BTS, RCP, SCMx7, TBA
BHIVA, British HIV Association BIA, British Infection Association BSAC, British Society for Antimicrobial Chemotherapy BTS, British Thoracic Society DCC, Devon County Council NHSE, NHS England RCN, Royal College of Nursing RCP, Royal College of Physicians[9] RCPCH, Royal College of Paediatrics and Child Health SCM, Specialist Committee Member x 7 TBA, TB Alert	

3.2 Identification of current practice evidence

Bibliographic databases were searched to identify examples of current practice in UK health and social care settings; 1890 studies were identified for QS topic. In addition, current practice examples were suggested by stakeholders at topic engagement (14 studies) and internally at project scoping (10 studies).

Of these studies, 6 were assessed as having potential relevance to this topic and the suggested areas for quality improvement identified by stakeholders (see appendix 3). A summary of relevant studies is included in the current practice sections for each suggested area of improvement.

[9] RCP submitted a statement to say they formally endorse the response submitted by the BTS.

4 Suggested improvement areas

4.1 Preventing TB

4.1.1 Summary of suggestions

Raising awareness amongst hard to reach groups

Stakeholders suggested improving outreach work with hard to reach and TB vulnerable populations will improve early detection of the disease. Stakeholders highlighted schools as organisations that could raise awareness by targeting new entrants to the UK.

4.1.2 Selected recommendations from development source

Table 4 below highlights recommendations that have been provisionally selected from the development source(s) that may support potential statement development. These are presented in full after table 4 to help inform the Committee's discussion.

Table 4 Specific areas for quality improvement

Suggested quality improvement area	Suggested source guidance recommendations
Raising awareness amongst hard to reach groups	**Raising and sustaining awareness of TB** NICE NG33 Recommendations 1.1.1.1 and 1.1.1.5 **Providing information for the public about TB** NICE NG33 Recommendations 1.1.2.1 and 1.1.2.5

Raising and sustaining awareness of TB

NICE NG33 – Recommendation 1.1.1.1

Multidisciplinary TB teams (in collaboration with Public Health England, primary care, the voluntary sector and Health Education England) should identify and support an ongoing TB education programme for local professionals in contact with the general public, and at-risk groups in particular. This includes, for example, staff in emergency departments, GPs and wider primary care staff, people who work in housing support services, staff who support migrants and those working in walk-in centres, hostels, substance misuse projects and prisons. [2012, amended 2016]

NICE NG33 – Recommendation 1.1.1.5

Multidisciplinary TB teams should help professionals working in relevant statutory, community and voluntary organisations to raise awareness of TB among under-served and other high-risk groups. These professionals should be able to explain that treatment for TB is free and confidential for everyone (irrespective of eligibility for other NHS care). They should also be able to provide people with details of:

- how to recognise symptoms in adults and children
- how people get TB
- the benefits of diagnosis and treatment (including the fact that TB is treatable and curable)
- location and opening hours of testing services
- referral pathways, including self-referral
- the potential interaction of TB medication with other drugs, for example, oral contraceptives and opioids (especially methadone) and HIV treatment
- TB/HIV co-infection
- how to address the myths about TB infection and treatment (for example, to counter the belief that TB is hereditary)
- how to address the stigma associated with TB
- the risk of migrants from high-incidence countries developing active TB – even if they have already screened negative for it
- contact tracing. **[2012, amended 2016]**

Providing information for the public about TB

NICE NG33 – Recommendation 1.1.2.1

National organisations (for example, National Knowledge Service – Tuberculosis, TB Alert, Public Health England, Department of Health and NHS Choices) should work together to develop generic, quality-assured template materials with consistent up-to-date messages. These materials should be made freely available and designed so that they can be adapted to local needs. **[new 2016]**

NICE NG33 – Recommendation 1.1.2.5

Disseminate materials in ways likely to reach target groups, for example, via culturally specific radio or TV stations, at shelters, and at community, commercial or religious venues that target groups attend regularly. **[new 2016]**

4.1.3 Current UK practice

No published studies on current practice were highlighted for this suggested area for quality improvement; this area is based on stakeholder's knowledge and experience.

4.1.4 Resource impact assessment

This area was not included in the resource impact assessment for NG33. Some resource impact work around multidisciplinary TB teams was carried out with NICE public heath guidance 37 and any further progress in this area was not identified as an area that would have a significant resource impact (>£1m in England each year).

4.2 Latent TB

4.2.1 Summary of suggestions

Diagnosing latent TB in new entrants

Stakeholders highlighted screening and treating all new entrants from high incidence TB countries as a priority area. They suggested that if this group were screened for latent TB and given treatment when found to have it, there would be a significant decline in the number of TB cases.

Stakeholders suggested there is currently a focus on screening new entrant adults for latent TB but not children meaning that there is potential to miss avoidable mortality and morbidity in children.

Testing for TB in people who are HIV positive

Stakeholders highlighted the importance of offering latent TB testing to HIV-positive adults with low CD4 counts.

Treatment up to the age of 65 years

Stakeholders highlighted the importance of offering treatment for latent TB infection up to the age of 65 years.

4.2.2 Selected recommendations from development source

Table 5 below highlights recommendations that have been provisionally selected from the development source(s) that may support potential statement development. These are presented in full after table 5 to help inform the Committee's discussion.

Table 5 Specific areas for quality improvement

Suggested quality improvement area	Selected source guidance recommendations
Diagnosing latent TB in new entrants	**Diagnosing latent TB in all age groups** NICE NG33 Recommendation 1.2.3.1 **Opportunistic case finding** NICE NG33 Recommendations 1.6.2.1 and 1.6.2.3
Testing for TB in people who are HIV positive	**Diagnosing latent TB in adults** NICE NG33 Recommendation 1.2.1.3
Latent TB treatment up to the age of 65 years	**Managing latent TB in all age groups** NICE NG33 Recommendation 1.2.4.2 **Managing latent TB in adults** NICE NG33 Recommendation 1.2.5.1

Diagnosing latent TB in new entrants

Diagnosing latent TB in all age groups

NICE NG33 Recommendation 1.2.3.1

Offer Mantoux testing as the initial diagnostic test for latent TB infection in people who have recently arrived from a high-incidence country who present to healthcare services. If the Mantoux test is positive (5 mm or larger, regardless of BCG history):

- assess for active TB and
- if this assessment is negative, offer them treatment for latent TB infection.
- If Mantoux testing is unavailable, offer an interferon-gamma release assay. [new 2016]

Opportunistic case finding

NICE NG33 Recommendation 1.6.2.1

Assess and manage TB in new entrants from high incidence countries who present to healthcare services as follows:

- assess risk of HIV, including HIV prevalence rates in the country of origin, and take this into account when deciding whether to give a BCG vaccination
- offer testing for latent TB
- assess for active TB if the test for latent TB is positive
- offer treatment to people aged 65 years or younger in whom active TB has been excluded but who have a positive Mantoux test or a positive interferon gamma release assay for latent TB infection
- consider offering BCG for unvaccinated people who are Mantoux or interferon gamma release assay negative
- give 'inform and advise' information to people who do not have active TB and are not being offered BCG or treatment for latent TB infection. [2006, amended 2011 and 2016]

NICE NG33 Recommendation 1.6.2.3

Healthcare professionals, including primary care staff, responsible for testing new entrants should test all vulnerable migrants who have not previously been checked. This is regardless of when they arrived in England. People born in countries with an incidence of more than 150 per 100,000 per year should be made a priority for latent TB testing when they arrive here. [2012, amended 2016]

Testing for TB in people who are HIV positive

Diagnosing latent TB in adults

NICE NG33 Recommendation 1.2.1.3

For adults who are severely immunocompromised, such as those with HIV and CD4 counts of fewer than 200 cells/mm^3, or after solid organ or allogeneic stem cell transplant, offer an interferon-gamma release assay and a concurrent Mantoux test.

- If either test is positive (for Mantoux, this is an induration of 5 mm or larger, regardless of BCG history), assess for active TB.
- If this assessment is negative, offer them treatment for latent TB infection. **[new 2016]**

Latent TB treatment up to the age of 65 years

Managing latent TB in all age groups

NICE NG33 Recommendation 1.2.4.2

For people, including those with HIV, aged younger than 65 years with evidence of latent TB who have been in close contact with people who have suspected infectious or confirmed active pulmonary or laryngeal drug-sensitive TB, offer either of the following drug treatments:

- 3months of isoniazid (with pyridoxine) and rifampicin or
- 6months of isoniazid (with pyridoxine). [new 2016]

Managing latent TB in adults

NICE NG33 Recommendation 1.2.5.1

For adults between the ages of 35 and 65 years, offer drug treatments only if hepatotoxicity is not a concern. [new 2016]

4.2.3 Current UK practice

Pre-entry TB screening for active pulmonary disease in all long-term visa applicants coming from high incidence countries to the UK was piloted from October 2005 to May 2012 and implemented in 101 countries between September 2012 and March 2014.

The UK pre-entry TB screening programme requires visa applicants from high TB incidence countries (≥ 40/100,000) who intend to stay in the UK for longer than six months to be certified free of pulmonary TB before they can apply for a visa.

A total of 961,725 applications were screened between October 2005 and December 2014 of which 233,251 were screened in 2014. The median age was 25 years (interquartile range: 9.2 years) and the largest proportion of applicants was aged 15 to 34 years. In total, 983 TB cases were detected between October 2005 and December 2014, giving an overall TB yield of 102.5 per 100,000 applications.[10]

4.2.4 Resource impact assessment

The first attendance outpatient appointment at a respiratory physiology costs £165. Treatment options for both active and latent TB have changed since the previous guideline and are now more cost efficient.

The average treatment costs are:

- average treatment costs for latent TB are around £750 per person
- average treatment costs for active TB are around £900 per person

[10] Public Health England (2015) Tuberculosis: pre-entry screening in the UK

4.3 Active TB

4.3.1 Summary of suggestions

Rapid access to diagnostics

Stakeholders highlighted the importance of rapid access to diagnostics, particularly for underserved groups who have much higher rates of TB than the general population. Delays in diagnosis for this population can lead to an increase in complex disease, morbidity and mortality.

Stakeholders identified rapid referral of imaging to the multidisciplinary TB team as a specific priority area.

Stakeholders also suggested that sputum smears should be examined within 24 hours in order to reduce transmission of TB.

Diagnosing TB in children

Stakeholders highlighted the importance of diagnosing TB in children. Some stakeholders focused on pulmonary TB in children whereas others focused on extrapulmonary TB. They suggested confirming TB in children can be difficult but it is important to obtain as much information as possible particularly if there is no obvious source of the TB.

Sputum testing at 2 months

Stakeholders suggested that sputum testing should occur at 2 months. It was suggested that the continuation phase of treatment should not be started in those with pulmonary tuberculosis unless the sputum smear is negative, the results of drug sensitivity testing are known and there are clinical data to show improvement. Stakeholders stated if these do not occur, there is the danger of developing drug resistance.

HIV testing for people with active TB

Stakeholders highlighted the importance of offering HIV testing to all people with active TB.

4.3.2 Selected recommendations from development source

Table 6 below highlights recommendations that have been provisionally selected from the development source(s) that may support potential statement development. These are presented in full after table 6 to help inform the Committee's discussion.

Table 6 Specific areas for quality improvement

Suggested quality improvement area	Selected source guidance recommendations
Rapid access to diagnostics	**Diagnosing pulmonary (including laryngeal) TB in all age groups** NICE NG33 Recommendation 1.3.2.2 **Diagnosing pulmonary (including laryngeal) TB in adults** NICE NG33 Recommendation 1.3.3.1 **Diagnosing pulmonary (including laryngeal) TB in children and young people** NICE NG33 Recommendations 1.3.4.1 and 1.3.4.2 **Rapid-access TB services** NICE NG33 Recommendations 1.8.9.1, 1.8.9.2, 1.8.9.8 and 1.8.9.9
Diagnosing TB in children	**Diagnosing pulmonary (including laryngeal) TB in children and young people** NICE NG33 Recommendations 1.3.4.1, 1.3.4.3
Sputum testing at 2 months	Not directly covered in NICE NG33 and no recommendations are presented.
HIV testing for people with active TB	Not directly covered in NICE NG33 and no recommendations are presented.

Rapid access to diagnostics

Diagnosing pulmonary (including laryngeal) TB in all age groups

NICE NG33 Recommendation 1.3.2.2

Send multiple respiratory samples (3 deep cough sputum samples, preferably including 1 early morning sample) for TB microscopy and culture. **[2016]**

- This should be before starting treatment if possible or, failing that, within 7 days of starting treatment in people with life threatening disease. [2006, amended 2016]
- Obtain spontaneously produced, deep cough sputum samples if possible, otherwise use:
- 3 gastric lavages or 3 inductions of sputum in children and young people (see recommendation 1.5.1.10) [new 2016] or
- induction of sputum or bronchoscopy and lavage in adults. [2006, amended 2016]
- Laboratory practices should be in accordance with the UK's Standards for Microbiology Investigations. [new 2016]

Diagnosing pulmonary (including laryngeal) TB in adults

NICE NG33 Recommendation 1.3.3.1

Request rapid diagnostic nucleic acid amplification tests for the *M. tuberculosis* complex (*M. tuberculosis*, *M. bovis*, *M. africanum*) on primary specimens if there is clinical suspicion of TB disease, and:

- the person has HIV **or**
- rapid information about mycobacterial species would alter the person's care **or**
- the need for a large contact-tracing initiative is being explored. **[new 2016]**

Diagnosing pulmonary (including laryngeal) TB in children and young people

NICE NG33 Recommendations 1.3.4.1

In children aged 15 years or younger with suspected pulmonary TB, offer rapid diagnostic nucleic acid amplification tests for the *M. tuberculosis* complex (*M. tuberculosis*, *M. bovis*, *M. africanum*). Usually only 1 nucleic acid amplification test is needed per specimen type (for example, spontaneous sputum, induced sputum or gastric lavage. **[new 2016]**

NICE NG33 Recommendations 1.3.4.2

In young people aged 16–18 years use the same criteria as in adults to decide whether to request rapid diagnostic nucleic acid amplification tests. **[new 2016]**

Rapid-access TB services

NICE NG33 Recommendation 1.8.9.1

Multidisciplinary TB teams should establish relationships with statutory, community and voluntary organisations that work with people at risk of TB to develop appropriate TB referral pathways. They should ensure these organisations know how to refer people to local TB services. [2012]

NICE NG33 Recommendation 1.8.9.2

Multidisciplinary TB teams should accept referrals from healthcare providers and allied organisations working in the community with under-served groups. This includes voluntary and statutory organisations (for example, mobile X-ray teams or community organisations or outreach workers working with vulnerable migrants). [2012]

NICE NG33 Recommendation 1.8.9.8

Multidisciplinary TB teams should ensure people who have a smear-positive result or imaging features highly suggestive of smear-positive TB (for example, evidence of cavitation on chest X-ray) are assessed the next working day. This is so that case management and infection control procedures start promptly. [2012, amended 2016]

NICE NG33 Recommendation 1.8.9.9

The multidisciplinary TB team should assess people who are not smear-positive but have imaging that suggests pulmonary or laryngeal TB as soon as possible. This should be no later than 5 working days after a referral. [2012, amended 2016]

Diagnosing TB in children

Diagnosing pulmonary (including laryngeal) TB in children and young people

NICE NG33 Recommendations 1.3.4.1

In children aged 15 years or younger with suspected pulmonary TB, offer rapid diagnostic nucleic acid amplification tests for the M. tuberculosis complex (M. tuberculosis, M. bovis, M. africanum). Usually only 1 nucleic acid amplification test is needed per specimen type (for example, spontaneous sputum, induced sputum or gastric lavage; see table 1). [new 2016]

NICE NG33 Recommendations 1.3.4.3

Either a paediatrician with experience and training in TB or a general paediatrician with advice from a specialised clinician should investigate and manage TB in children and young people. **[new 2016]**

4.3.3 Current UK practice

Public Health England's Enhanced Tuberculosis Surveillance System reported that in 2014:

- 40% of pulmonary TB cases started treatment within two months of symptom onset (exclusions: TB cases with no date of symptom onset or date of treatment start and TB cases diagnosed post-mortem).
- 70% of pulmonary TB cases started treatment within four months of symptom onset (exclusions: TB cases with no date of symptom onset or date of treatment start and TB cases diagnosed post-mortem).

Public Health England's Enhanced Tuberculosis Surveillance System reported 85% of TB cases were offered an HIV test in England in 2014 (exclusions: TB Cases where HIV status was already known and TB cases diagnosed post mortem).[11]

Turkova et al[12] (2014) undertook a survey based on an electronic questionnaire on the management of latent tuberculous infection (LTBI) and tuberculosis (TB) disease in 13 specialist paediatric TB clinics. Findings relevant to this quality improvement area showed 11 of the 13 centres (77%) reported using sputum induction to obtain a microbiological sample; of these, two (20%) carried out this procedure at any age. In children with uncomplicated pulmonary TB, eight clinics (62%) reported performing a repeat chest X-ray a few months after the start of treatment. Two thirds (8/12[67%]) reported repeating the chest X-ray at the end of treatment, irrespective of the extent of pulmonary TB disease.

4.3.4 Resource impact assessment

Any resource impact associated with rapid access TB services is likely to vary widely depending on current local service organisation arrangements and local demographics, but it could be significant in certain areas.

A report on the cost impact analysis to support the development of TB service delivery recommendations has been produced. The report looks at the evidence of the costs and benefits of rapid radiology referral and a questionnaire was completed which provides some estimates of the patient volume in Leicestershire.

The results of a questionnaire indicates that 80% of a wte (0.8 wte) grade 6 radiology administrator is required to manage the radiology coding and referrals. Clinician time was also required for making the triage decisions based on x-ray. It was estimated the time needed would be 30 minutes per referral.

In terms of savings, the questionnaire indicated that there are likely to be fewer hospitalised cases and reduced length of stay as a result of rapid radiology referral. No quantitative data was available for this, thus a range was used to estimate the

[11] Public Health England (2014) Enhanced Tuberculosis Surveillance System (ETS) TB Strategy Monitoring Indicators.
[12] Turkova. A. et al (2014) Management of paediatric tuberculosis in leading UK centres: unveiling consensus and discrepancies, International Journal of Tuberculosis and Lung Disease 18(9):1047–1056.

possible number of hospitalisations avoided. This range was calculated by assuming between 0% and 50% of active cases would require hospitalisations per year if not diagnosed early due to rapid radiology referral.

The cost impact analysis is as follows:

- The cost impact is between -£37,312 and £37,682 depending on the number of hospitalisations avoided per year.
- The analysis indicates that if 15 or more hospitalisations are avoided per year due to radiology referral, the service will be cost saving. If outcomes are no worse or improved then this would be considered a cost effective use of resources.
- In the worst case scenario, assuming that the number of hospitalisations avoided is 0 per year, then the service will have a cost impact of £37,682 per year. To off-set this cost the service would need to prevent 8 cases of standard active TB or 3 cases of active TB in hard-to-reach people per year.
- In settings where the administrator time is absorbed (no additional cost), then the cost impact will simply be the clinician time of £8,762. In this instance, the service will be cost saving if 4 or more hospitalisations are avoided per year due to radiology referral.

4.4 Drug resistant TB

4.4.1 Summary of suggestions

Use of rapid diagnostic nucleic acid amplification tests (NAATs) for MDR-TB

Stakeholders highlighted the use of rapid diagnostic nucleic acid amplification tests (NAATs) for rifampicin resistance if risk factors for MDR-TB are identified as an area for quality improvement.

Isolation of drug resistant cases

Stakeholders highlighted the importance of isolating patients with MDR-TB in a side or negative pressure room.

Stakeholders also highlighted the need to address the social, behavioural and economic issues around enforced isolation of drug resistant cases as an area for quality improvement. They suggested that if these issues are not addressed they may lead to a refusal to engage with health and public health services, increase treatment failure and costs.

Management of patients with mono-drug resistant TB

Stakeholders suggested that patients with mono-drug resistant TB should be managed by a clinician with experience in the area.

Review of patients with multidrug- resistant TB by expert centres

Stakeholders suggested that reviewing cases at a regional or national level potentially offers a higher level of skill-sharing and experience in a complex clinical area. They specifically made reference to the establishment of MDR-TB network and expert centres.

Stakeholders suggested that patients with MDR-TB should be discussed with the national advisory service. They suggested that as the number of MDR cases are low in England some physicians may have little experience in treating these patients and would therefore benefit from the peer review and advice from experts that is provided by the national advisory service.

4.4.2 Selected recommendations from development source

Table 7 below highlights recommendations that have been provisionally selected from the development source(s) that may support potential statement development. These are presented in full after table 7 to help inform the Committee's discussion.

Table 7 Specific areas for quality improvement

Suggested quality improvement area	Selected source guidance recommendations
Use of rapid diagnostic nucleic acid amplification tests (NAATs) for MDR-TB	**Multidrug-resistant TB** NICE NG33 Recommendation 1.4.1.1
Isolation of drug resistant cases	**Healthcare settings** NICE NG33 Recommendations 1.5.1.2 and 1.5.1.4 **Multidrug-resistant TB** NICE NG33 Recommendations 1.5.3.1, 1.5.3.2 and 1.5.3.3
Management of patients with mono-drug resistant TB	**Drug‑resistant TB (excluding multidrug‑ and extensively drug‑resistant TB)** NICE NG33 Recommendation 1.4.2.2
Discussing patients with multidrug-resistant TB with the national advisory service for MDR-TB	**Regional multidrug‑resistant TB network** NICE NG33 Recommendation 1.8.3.1

Use of rapid diagnostic nucleic acid amplification tests (NAATs) for MDR-TB

Multidrug resistant TB

NICE NG33 Recommendation 1.4.1.1

For people with clinically suspected TB, a TB specialist should request rapid diagnostic nucleic acid amplification tests for rifampicin resistance on primary specimens if a risk assessment for multidrug resistance identifies any of the following risk factors:

- history of previous TB drug treatment, particularly if there was known to be poor adherence to that treatment
- contact with a known case of MDR-TB
- birth or residence in a country in which the World Health Organization reports that a high proportion (5% or more) of new TB cases are multidrug-resistant.

Start infection control measures [new 2016]

Isolation of drug resistant cases

Healthcare settings

NICE NG33 Recommendation 1.5.1.2

Put people with suspected infectious or confirmed pulmonary or laryngeal TB who will remain in a hospital setting (including emergency, outpatients or inpatient care)

in a single room. If this is not possible, keep the person's waiting times to a minimum. This may involve prioritising their care above that of other patients. [new 2016]

NICE NG33 Recommendation 1.5.1.4

In hospital settings, risk assess people with suspected infectious or confirmed pulmonary TB for multidrug-resistant TB. Care for people deemed to be at low risk in a single room, as a minimum. For people deemed to be at high risk:

- provide care in a negative pressure room **and**
- have specimens sent for rapid diagnostic tests, such as nucleic acid amplification tests. **[new 2016]**

Multidrug resistant TB

NICE NG33 Recommendation 1.5.3.1

If people with suspected or known infectious multidrug-resistant TB are admitted to hospital, admit them to a negative pressure room. If none is available locally, transfer them to a hospital that has these facilities and a clinician experienced in managing complex drug-resistant cases. Carry out care in a negative pressure room for people with:

- suspected multidrug-resistant TB, until non-resistance is confirmed
- confirmed multidrug-resistant TB, until they have 3 negative smears at weekly intervals and ideally have a negative culture. **[new 2016]**

NICE NG33 Recommendation 1.5.3.2

As soon as possible, explore options to reduce the psychosocial impact of prolonged isolation. For example, through providing free access to internet, telephone and television, and accompanied walks in the open air. **[new 2016]**

NICE NG33 Recommendation 1.5.3.3

Consider earlier discharge for people with confirmed multidrug‑resistant TB, if there are suitable facilities for home isolation and the person will adhere to the care plan. **[new 2016]**

Management of patients with mono-drug resistant TB

Drug‑resistant TB (excluding multidrug‑ and extensively drug‑resistant TB)

NICE NG33 Recommendation 1.4.2.2

For people with drug‑resistant TB and central nervous system involvement, involve a TB specialist with experience in managing drug‑resistant TB in decisions about the most appropriate regimen and the duration of treatment. **[new 2016]**

Discussing patients with multidrug- resistant TB with the national advisory service for MDR-TB

Regional multidrug‑resistant TB network

NICE NG33 Recommendation 1.8.3.1

TB control boards should consider setting up a regional multidisciplinary TB network to oversee management of multidrug-resistant TB. This could:

- Identify and designate regional expert centres.
- Ensure all healthcare professionals who suspect or treat a case of multidrug-resistant TB are informed about and have access to specialist advisory services for multidrug-resistant TB. This includes the designated expert centre in their regional network and may also include the national advisory service for multidrug-resistant TB (currently provided by the British Thoracic Society).
- Ensure all cases of multidrug-resistant TB are discussed at the regional multidisciplinary TB team meeting in the local clinical network.
- Formally consider and record the advice from the specialist advisory services for multidrug-resistant TB provided by the designated regional expert centre or the national advisory service for multidrug-resistant TB. **[new 2016]**

4.4.3 Current UK practice

Jordan et al[13] (2012) reported a virtual electronic expert panel, the UK Multidrug-Resistant Tuberculosis Service, has been developed. This body gives advice via a secure website on MDR-TB patients referred by e-mail by clinicians across the country managing MDR-TB cases. Findings showed in the first 2 years of operation, advice was sought on 60 patients with culture-proven MDR-TB (54% of the UK total). The number of clinicians accessing the advisory service increased from 27 in 2008 to 33 in 2009. Jordan et al (2012) concluded the rising trend in use of the MDR-TB Advisory Service by clinicians is likely to represent a growing awareness of its

[13] Jordan, T. S., Cullen, D., Davies, P. D. O. (2012) A centralised electronic Multidrug-Resistant Tuberculosis Advisory Service: the first 2 years, The International Journal of Tuberculosis and Lung Disease 16(7): 950-954.

existence, the ease of access to an expert panel and confidence in the advice and support provided.

4.4.4 Resource impact assessment

This area was not included in the resource impact assessment for NG33. It was not identified as an area that would have a significant resource impact (>£1m in England each year).

4.5 Case finding

4.5.1 Summary of suggestions

Case finding in people using homeless or substance misuse services

Stakeholders highlighted the importance of comprehensive contact screening and active case finding in people using homeless, drug and alcohol services. More specifically stakeholders suggested screening of an average of 5 close contacts per pulmonary TB case as a key area for quality improvement.

4.5.2 Selected recommendations from development source

Table 8 below highlights recommendations that have been provisionally selected from the development source(s) that may support potential statement development. These are presented in full after table 8 to help inform the Committee's discussion.

Table 8 Specific areas for quality improvement

Suggested quality improvement area	Selected source guidance recommendations
Case finding in people using homeless or substance misuse services	**Opportunistic case finding – people using homeless or substance misuse services** NICE NG33 Recommendation 1.6.2.4

Opportunistic case finding - people using homeless or substance misuse services

NICE NG33 Recommendation 1.6.2.4

In areas of identified need, including major urban centres with a high incidence of TB, commissioners should:

- ensure there is a programme of active case-finding using mobile X-ray in places where homeless people and people who misuse substances congregate (this includes: homeless day centres, rolling shelters, hostels and temporary shelters established as part of cold weather initiatives and venues housing needle and syringe programmes)
- base the frequency of screening at any 1 location on population turnover
- where local demand does not warrant a mobile X-ray team, consider commissioning mobile X-ray capacity from another area. **[2006, amended 2012]**

4.5.3 Current UK practice

Currently, there is considerable variation in the extent to which household and community-based contact tracing is undertaken. Where community outreach workers have been used, particularly to do home-based contact tracing, the effectiveness of local TB control has improved[14].

4.5.4 Resource impact assessment

This area was not included in the resource impact assessment for NG33. Some resource impact work around opportunistic case finding was carried out with NICE public heath guidance 37 and any further progress in this area was not identified as an area that would have a significant resource impact (>£1m in England each year).

[14] Public Health England in partnership with NHS England (2015) The Collaborative TB Strategy for England, 2015-2020.

4.6 Adherence, treatment completion and follow-up

4.6.1 Summary of suggestions

Enhanced case management and directly observed therapy (DOT)

Stakeholders suggested that good comprehensive enhanced case management and DOT will help to improve adherence, treatment completion and reduce loss to follow-up for TB patients. One specific suggestion for this area was provision of 7 day a week DOT for pulmonary TB patients with social risk factors and those with drug resistant disease. Stakeholders stated that this is important particularly for patients in under-served groups who have complex social and clinical needs.

Improved treatment completion rates for under-served groups

Stakeholders suggested TB services should demonstrate improved TB completion for under-served populations. More specifically stakeholders suggested that measuring the proportion of drug-sensitive TB cases with at least one social risk factor who complete treatment will indirectly measure improved care of under-served populations and in turn should help to reduce health inequalities for this group.

4.6.2 Selected recommendations from development source

Table 9 below highlights recommendations that have been provisionally selected from the development source(s) that may support potential statement development. These are presented in full after table 9 to help inform the Committee's discussion.

Table 9 Specific areas for quality improvement

Suggested quality improvement area	Selected source guidance recommendations
Enhanced case management and DOT	**Improving adherence: case management including directly observed therapy** NICE NG33 Recommendations 1.7.1.1, 1.7.1.3 and 1.7.1.4 **Managing active TB in all age groups** NICE NG33 Recommendation 1.3.7.13 **Multidrug-resistant TB** NICE NG33 Recommendation 1.4.1.6
Improved treatment completion rates for under-served groups	**Improving adherence: case management including directly observed therapy** NICE NG33 Recommendation 1.7.1.8

Enhanced case management and DOT

Improving adherence: case management including directly observed therapy

NICE NG33 Recommendation 1.7.1.1

Allocate a named TB case manager to everyone with active TB as soon as possible after diagnosis (and within 5 days). The clinical team should tell each person who their named TB case manager is and provide contact details. **[2006, 2012 amended 2016]**

NICE NG33 Recommendation 1.7.1.3

Offer directly observed therapy as part of enhanced case management in people who:

- do not adhere to treatment (or have not in the past)
- have been treated previously for TB
- have a history of homelessness, drug or alcohol misuse
- are currently in prison, or have been in the past 5 years
- have a major psychiatric, memory or cognitive disorder
- are in denial of the TB diagnosis
- have multidrug-resistant TB
- request directly observed therapy after discussion with the clinical team
- are too ill to administer the treatment themselves. **[2012, amended 2016]**

NICE NG33 Recommendation 1.7.1.4

In children whose parents are members of any of the above groups, offer directly observed therapy as part of enhanced case management and include advice and support for parents to assist with treatment completion. **[2016]**

Managing active TB in all age groups

NICE NG33 Recommendation 1.3.7.13

Consider 3 times weekly dosing for people with active TB only if:

- a risk assessment identifies a need for directly observed therapy and enhanced case management **and**
- daily directly observed therapy is not possible. **[2006, amended 2016]**

Multidrug‐resistant TB

NICE NG33 Recommendation 1.4.1.6

Consider more intensive clinical follow‐up for people with multidrug‐resistant TB. This includes people having directly observed therapy throughout treatment because of the complexity of treatment and risk of adverse events. [new 2016]

Improved treatment completion rates for under-served groups

Improving adherence: case management including directly observed therapy

NICE NG33 Recommendation 1.7.1.8

Multidisciplinary TB teams should aim to find people with active TB who are lost to follow-up, or who stop using services before completing diagnostic investigations. They should report all those lost to follow‐up to local Public Health England teams, GPs, the referring organisation and specialist outreach teams. [2012]

4.6.3 Current UK practice

Public Health England's Enhanced Tuberculosis Surveillance System reports the following:

- In 2013 85% of drug sensitive TB cases in England completed a full course of treatment by 12 months (exclusions: TB cases with rifampicin resistance or MDR-TB and TB cases with CNS, spinal, miliary or disseminated TB)
- In 2013 76% of drug sensitive TB cases with at least one social risk factor (alcohol or drug misuse, prison history or homeless) completed treatment within 12 months (exclusions: TB cases with rifampicin resistance or MDR-TB).
- In 2013 3.9% of drug sensitive TB cases in England were lost to follow up at last reported outcome (exclusions: TB cases with rifampicin resistance or MDR-TB).

The Collaborative TB Strategy for England, 2015-2020 reports that in 2011:

- 47% of drug resistant TB cases had completed treatment at 24 months
- 20% of drug resistant TB cases were lost to follow up at last reported outcome

4.6.4 Resource impact assessment

To provide care for the increased numbers of people with TB there may be a need for additional staff in some areas. This area was not included in the resource impact assessment for NG33. It was not identified as an area that would have a significant resource impact (>£1m in England each year). However, this may need to be evaluated locally and where possible current resources should be used.

4.7 Service organisation

4.7.1 Summary of suggestions

Workforce planning

Stakeholders highlighted the importance of having appropriately resourced and skilled multi-disciplinary teams to ensure effective case finding, prompt and accurate diagnosis, effective treatment and treatment support, and appropriately targeted and delivered prevention strategies. Stakeholders suggested that professional, skilled workers should be part of every TB MDT to ensure that patients receive the correct support and advice for the problems that may prevent adherence to treatment or may result in poor clinical outcomes. Stakeholders suggested that this is particularly important for complex and drug resistant cases.

TB service specifications

Stakeholders suggested TB Control Boards and TB Services should be working to a localised version of the national TB Service Specification. Stakeholders stated that the national TB service specification outlines what a comprehensive TB Service should provide and if adhered to should improve TB services across England and so improve TB control.

Cohort review

Stakeholders highlighted the importance of undertaking quarterly cohort review stating that it is an essential method of service evaluation and provides an opportunity to systematically review the management of all patients. More specifically stakeholders suggested TB services should participate in cohort review on a 3-4 monthly basis.

Organisation of TB services for children

Stakeholders highlighted the investigation and management of TB in children as an area for quality improvement. They suggested if children's care is not delivered by people with the relevant experience that this can have an adverse effect on the child's clinical outcome and sometimes leads to a longer or more complicated treatment regime for the child.

Stakeholders also suggested clearer guidance is needed about the level of experience and training required for paediatricians who are investigating and managing TB in children.

Partnership working with third sector stakeholders

Stakeholders highlighted the importance of working in partnership with and appropriate commissioning of third sector stakeholders. They suggested that third sector organisations can have a good understanding of and access to communities affected by TB meaning they can increase awareness, reduce TB-related stigma and provide psycho-social support to patients.

Accommodation during treatment

Stakeholders highlighted the importance of providing accommodation for patients during TB treatment. Groups that were highlighted specifically included homeless and hostel dwelling patients, patients who are ineligible for state-funded accommodation and multidrug resistant patients.

4.7.2 Selected recommendations from development source

Table 10 below highlights recommendations that have been provisionally selected from the development source(s) that may support potential statement development. These are presented in full after table 10 to help inform the Committee's discussion.

Table 10 Specific areas for quality improvement

Suggested quality improvement area	Selected source guidance recommendations
Workforce planning	**Developing the TB prevention and control programme** NICE NG33 Recommendation 1.8.2.9 **Commissioning multidisciplinary TB support** NICE NG33 Recommendations 1.8.7.1 – 2 **Non-clinical roles including TB support workers** NICE NG33 Recommendations 1.8.8.1 – 2
TB service specifications	**Developing the TB prevention and control programme** NICE NG33 Recommendation 1.8.2.8 and 1.8.2.10
Cohort review	**Developing the TB prevention and control programme** NICE NG33 Recommendation 1.8.2.4 **Cohort review** NICE NG33 Section 1.8.6
Organisation of TB services for children	**Commissioning multidisciplinary TB support** NICE NG33 Recommendation 1.8.7.1 **Diagnosing pulmonary (including**

	laryngeal) TB in children and young people NICE NG33 Recommendation 1.3.4.3
Partnership working with third sector stakeholders	**Non-clinical roles including TB support workers** NICE NG33 Recommendation 1.8.8.4
Accommodation during treatment	**Accommodation during treatment** NICE NG33 Recommendations 1.8.11.1 - 3

Workforce planning

Strategic oversight and commissioning of TB prevention and control activities

NICE NG33 Recommendation 1.8.2.9

TB control boards should ensure there is sufficient capacity available to them to manage a sudden increase in demand such as:

- TB contact investigations, (such as incidents in congregate settings)
- large scale active case-finding initiatives in under-served groups in the community
- outbreaks in a variety of settings or sites where transmission risk may be high, including but not limited to schools, workplaces, hostels and prisons. **[new 2016]**

Commissioning multidisciplinary TB support

NICE NG33 Recommendation 1.8.7.1

Commissioners should ensure multidisciplinary TB teams:

- Have the skills and resources to manage the care of people with active TB who are not from under-served groups. **[2012, amended 2016]**
- Include at least 1 TB case manager with responsibility for planning and coordinating the care of under-served people and those with active TB who receive enhanced case management. **[2012, amended 2016]**
- Have the resources to manage latent TB care in under-served groups and the wider population. **[new 2016]**
- Include a range of clinical specialties in the multidisciplinary TB team, including paediatrics, infection control and respiratory medicine. **[2012]**
- Have regular attendance at these multidisciplinary team and cohort review meetings for all team members included as a programmed activity as part of their work planning. **[new 2016]**
- Have the skills and resources necessary to manage the care of people with complex social and clinical needs (either directly or via an established route).

This includes the ability to provide prompt access (or if necessary, referral) to skilled outreach and advocacy workers who can draw on the services of allied practitioners. The aim is to address people's housing, asylum, immigration, welfare, substance dependency and other health and social care needs. (The allied practitioner support should include both a specified housing officer and a social worker.) **[2012]**

- Can provide rapid access TB clinics for all cases, including under-served groups. **[2012]**
- Consider providing administration support for TB nurses and case managers so they have capacity for clinical and case management work. This could include giving TB nurses access to computer hardware and software. **[new 2016]**
- Have the resources to provide a continuous service throughout the year, ensuring the TB service accounts for the following to manage continuity of care:
    - planned absence (for example, professional development, mandatory training, annual, maternity or paternity leave)
    - unplanned absence (such as sickness absence). [2012, amended 2016]
- Can provide prompt access to a professional who has training and experience in assessing and protecting children and vulnerable adults at risk of abuse or neglect. **[2012]**
- Have access to funds through local government and clinical commissioning groups that can be used flexibly to improve adherence to treatment among under-served groups. For example, funds could be used to provide transport to clinics, to provide support or enablers for treatment, or for paying outreach workers or community services to support directly observed therapy. Funds may also be used to provide accommodation during treatment. **[2012, amended 2016]**
- Have the resources to provide ongoing TB awareness-raising activities for professional, community and voluntary (including advocacy) groups that work with populations at high risk of TB. These resources could be financed by local government or clinical commissioning groups. **[2012, amended 2016]**

NICE NG33 Recommendation 1.8.7.2

Commissioners should ensure NHS England's safe staffing principles are applied when commissioning TB services. **[new 2016]**

Non‑clinical roles including TB support workers

NICE NG33 Recommendation 1.8.8.1

TB control boards and local TB services should consider employing trained, non-clinically qualified professionals to work alongside clinical teams to agreed protocols, and to contribute to a variety of activities. Examples of this may include

awareness raising and supporting people to attend appointments (including other health and social care appointments). They could also help with collecting samples, contact tracing, case management including directly observed therapy and cohort review, or any other aspect of the service if:

- they are trained to deliver the intervention or processes effectively
- they are supported, mentored and supervised by a named case manager, such as a TB nurse
- they have the skills to monitor, evaluate and report on their work practices and outcomes to maintain a process of ongoing evaluation and service improvement in relation to cohort review. **[new 2016]**

NICE NG33 Recommendation 1.8.8.2

TB control boards should ensure that people working in the TB service have the right knowledge, engagement, advocacy and communication skills to meet the needs (for example, language, cultural or other requirements) of all the groups they may work with. **[new 2016]**

TB service specifications

Developing the TB prevention and control programme

NICE NG33 Recommendation 1.8.2.8

TB control board staff should have clearly defined roles and responsibilities. Their roles and responsibilities could include:

- Establishing the links, partnerships and relationships between all aspects of the control board area within their remit (if necessary across usual geographical commissioning boundaries).
- Developing and supporting adoption and implementation of evidence-based model service specifications for the clinical and public health actions needed to control TB including:
    - improving access and early diagnosis
    - diagnostics, treatment and care services
    - contact investigations and tracing
    - cohort review
    - vaccination
    - drug resistance

- tackling TB in under-served populations
- surveillance, monitoring and quality assurance
- workforce development and commissioning. **[new 2016]**

NICE NG33 Recommendation 1.8.2.10

To set up, monitor and evaluate a TB control programme, TB control boards should:

- agree plans within their partnerships to assess local services against the service specifications **[new 2016]**

Cohort review

Developing the TB prevention and control programme

NICE NG33 Recommendation 1.8.2.4

TB control boards should ensure cohort review is undertaken at least quarterly, and the results are fed back to local clinical and TB networks. These should be agreed by accountable bodies such as clinical commissioning groups, trust management, regional Public Health England and centre directors and local authority directors of public health as agreed, all of whom should make sure appropriate action is taken. **[new 2016]**

Cohort review

NICE NG33 Section 1.8.6

Organisation of TB services for children

Commissioning multidisciplinary TB support

NICE NG33 Recommendation 1.8.7.1

Commissioners should ensure multidisciplinary TB teams:

- Include a range of clinical specialties in the multidisciplinary TB team, including paediatrics, infection control and respiratory medicine. [2012]

Diagnosing pulmonary (including laryngeal) TB in children and young people

NICE NG33 Recommendation 1.3.4.3

Either a paediatrician with experience and training in TB or a general paediatrician with advice from a specialised clinician should investigate and manage TB in children and young people. **[new 2016]**

Partnership working with third sector stakeholders

Non-clinical roles including TB support workers

NICE NG33 Recommendation 1.8.8.4

Commissioners and TB control boards should ensure they put in place appropriate governance (including clear lines of accountability and extension of scope of practice) and data sharing practices and agreements. This includes ensuring they are part of service level agreements between NHS and non-NHS services, for example, the third sector or local government, and appropriate training has been completed. [new 2016]

Accommodation during treatment

NICE NG33 Recommendation 1.8.11.1

Multidisciplinary TB teams should assess the living circumstances of people with TB. Where there is a housing need they should work with allied agencies to ensure that all those who are entitled to state-funded accommodation receive it as early as possible during their treatment, for example, as a result of a statutory homelessness review and identified need. [2012, amended 2016]

NICE NG33 Recommendations 1.8.11.2

Multidisciplinary TB teams, commissioners, local authority housing lead officers and other social landlords, providers of hostel accommodation, hospital discharge teams, Public Health England and the Local Government Association should work together to agree a process for identifying and providing accommodation for homeless people diagnosed with active pulmonary TB who are otherwise ineligible for state-funded accommodation. This includes people who are not sleeping rough but do not have access to housing or recourse to public funds. The process should detail the person's eligibility and ensure they are given accommodation for the duration of their TB treatment. [2012, amended 2016]

NICE NG33 Recommendations 1.8.11.3

Local government and clinical commissioning groups should fund accommodation for homeless people diagnosed with active TB who are otherwise ineligible for state-funded accommodation. Use health and public health resources, in line with the Care Act 2014. **[2012, amended 2016]**

4.7.3 Current UK practice

Bothamley et al[15] (2011) identified primary care trusts or TB clinics with an average of > 100 TB cases per year who then provided reflections on the reasons for any change in their local incidence, which was compared to an audit against the national TB plan. The data accessed during the research showed that all of the cities identified had TB networks, a key worker for each case, free treatment and arrangements to treat HIV coinfection. Achievement of targets in the national plan correlated well with change in workload figures for the commissioning organisations but not with clinic numbers. Four cities had not achieved the target of one nurse per 40 notifications. Compared to other cities, their loss to follow-up during treatment was usually > 6% ($c2 = 4.2$, $P < 0.05$), there was less TB detected by screening and less outreach. The city that was most poorly resourced also showed the highest rate of increase of TB.

The Collaborative TB Strategy for England, 2015-2020 suggests there is considerable variation in the extent to which household and community-based contact tracing is undertaken. Where community outreach workers have been used, particularly to do home-based contact tracing, the effectiveness of local TB control has improved[16].

Turkova et al[17] (2014) undertook a survey based on an electronic questionnaire on the management of latent tuberculous infection (LTBI) and tuberculosis (TB) disease in 13 specialist paediatric TB clinics in the UK. The clinics were located in paediatric outpatients in nine centres, while the remaining four were running a joint adult/paediatric TB family clinic. Twelve clinics (92%) had input from a consultant in paediatric infectious diseases or a paediatric respiratory consultant. Eleven clinics (85%) had adult TB nurses, providing a link with adult care and carrying out contact tracing. Conclusions were that the survey showed heterogeneity in several aspects of clinical care for children with TB.

[15] Bothamley. G. et al. (2014) Tuberculosis in UK cities: workload and effectiveness of tuberculosis control programmes, BMC Public Health 11:896.

[17] Turkova. A. et al (2014) Management of paediatric tuberculosis in leading UK centres: unveiling consensus and discrepancies, International Journal of Tuberculosis and Lung Disease 18(9):1047–1056.

4.7.4 Resource impact assessment

This area was not included in the resource impact assessment for NG33. It was not identified as an area that would have a significant resource impact (>£1m in England each year).

The resource impact of support workers should be evaluated locally. In areas where lower band support workers (band 3) are employed, the support worker is cost saving.

4.8 Additional areas

Summary of suggestions

The improvement areas below were suggested as part of the stakeholder engagement exercise. However they were felt to be either unsuitable for development as quality statements, outside the remit of this particular quality standard referral or require further discussion by the Committee to establish potential for statement development.

There will be an opportunity for the QSAC to discuss these areas at the end of the session on 05/05/16.

Achieving TB treatment completion of >85%

Stakeholders suggested achieving TB treatment completion rates of greater than 85% as an important marker of quality.

Availability of BCG vaccination

Stakeholder highlighted reliable access to BCG as an area for quality improvement as it is a requirement for running an effective vaccination programme.

Best test for contacts

Stakeholders highlighted the issue of which test is optimum for contacts, and which or what combination, is optimum in particular circumstances.

Dual diagnosis: TB and mental health

Stakeholders highlighted the issue that mental health and acute hospital trusts are separate from each other which can cause difficulties when a patient has a dual diagnosis.

Evidence base for NICE guidance on Tuberculosis

Stakeholders suggested that randomised controlled trials, and not expert opinion, should form the basis of NICE guidance in Tuberculosis.

Guidance on who to include in contact tracing

Stakeholders suggested that current guidance on contact tracing is quite permissive and is open to interpretation. They suggested there is a risk of both not extending contact tracing far enough (being strict about only testing household contacts, and being strict about the definition of household) and being too inclusive, so that costs

become uncontrolled and positive contacts might represent the background prevalence rather than being related to the index case.

Interferon-gamma release assays values

Stakeholders suggested that interferon-gamma release assays for the detection of latent TB infection should give the actual values rather than just positive or negative results.

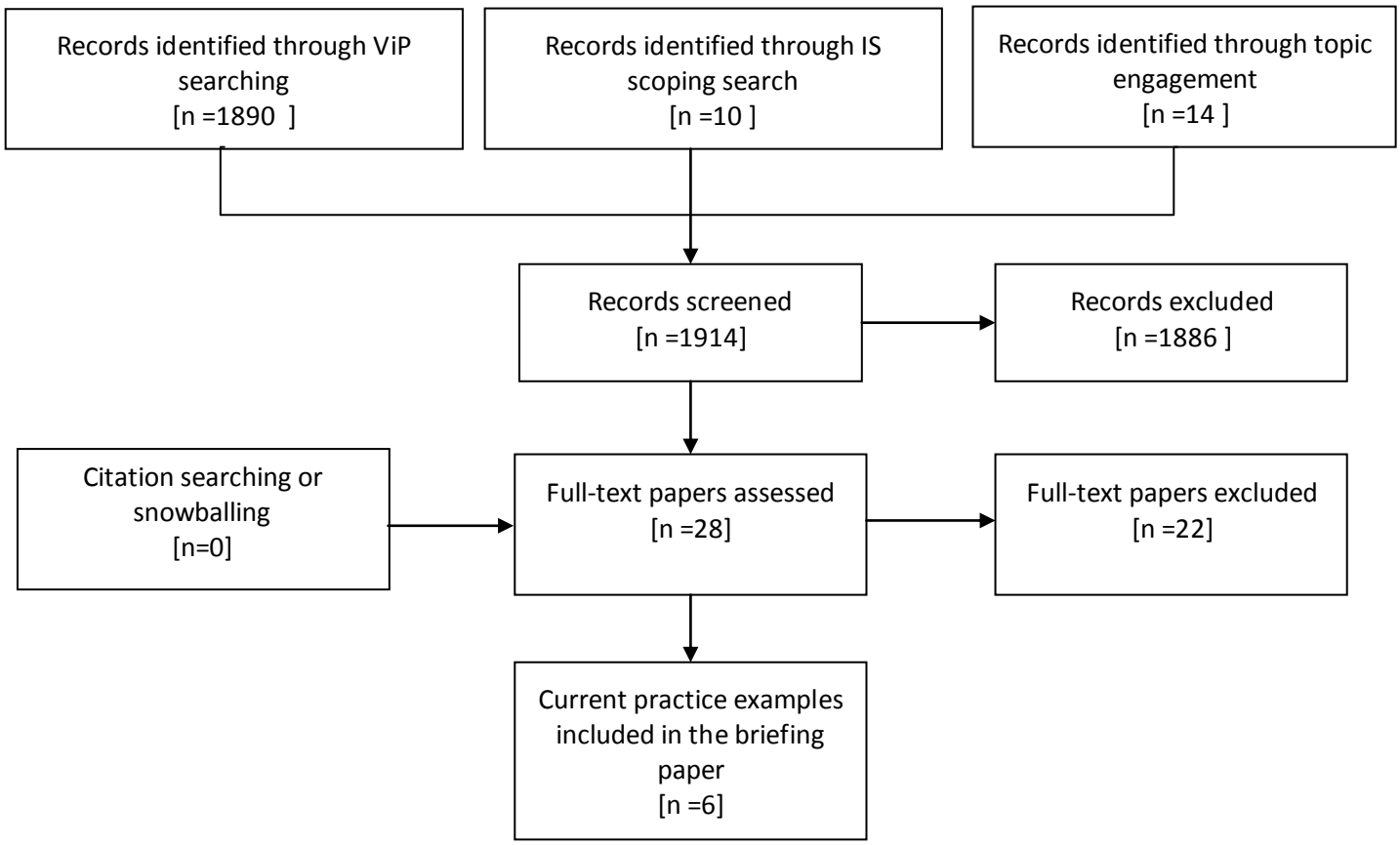
Specimens with evidence of rpoB mutations

Stakeholders suggested that specimens with evidence of rpoB mutations should be followed by PCRs for other first-line and second-line drugs. They suggested a rational choice of drugs should be made, which avoids treating patients with a standard regimen where perhaps only one or two drugs are effective. Stakeholders suggested that if the number of drugs used for treating drug-resistance is too low, further resistance may arise.

Type of TB test in people who are HIV positive

Stakeholders also raised the issue of how to test for TB in HIV infected individuals.

Appendix 1: Review flowchart



Appendix 2: Glossary

Adherence refers to the person's ability or willingness to keep to a treatment regimen as directed.

Case management involves follow-up of a person suspected or confirmed to have TB. It needs a collaborative, multidisciplinary approach and should start as soon as possible after a suspected case is discovered.

Close contacts are people who have had prolonged, frequent or intense contact with a person with infectious TB. For example, these could include 'household contacts' – those who share a bedroom, kitchen, bathroom or sitting room with the index case.

Cohort review is a systematic quarterly audit of the management and treatment of all TB patients and their contacts. The 'cohort' is a group of cases counted over a specific time, usually 3 months. Brief details of the management and outcomes of each case are reviewed in a group setting. The case manager presents the cases they are responsible for, giving the opportunity to discuss problems and difficulties in case management, service strengths and weaknesses, and staff training needs.

Enhanced case management is management of TB for someone with clinically or socially complex needs. It starts as soon as TB is suspected. As part of enhanced case management, the need for directly observed treatment is considered, along with a package of supportive care tailored to the person's needs.

Extrapulmonary TB active TB disease in any site other than the lungs or tracheobronchial tree.

Multidisciplinary TB teams a team of professionals with a mix of skills to meet the needs of someone with TB who also has complex physical and psychosocial issues (that is, someone who is under-served). Team members will include a social worker, voluntary sector and local housing representatives, TB lead physician and nurse, a case manager, a pharmacist, an infectious disease doctor or consultant in communicable disease control or health protection, a peer supporter or advocate and a psychiatrist.

Multidrug-resistant TB TB resistant to isoniazid and rifampicin, with or without any other resistance.

New entrant anyone coming to work or settle in the UK. This includes immigrants, refugees, asylum seekers, students and people on work permits. It also includes UK-born people, or UK citizens, re-entering the country after a prolonged stay in a high-incidence country.

Appendix 3: Suggestions from stakeholder engagement exercise – registered stakeholders

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
001	SCM7	Outreach and awareness work	Early detection of disease can be improved through outreach work with 'hard to reach' and 'TB vulnerable' populations.	Not all hard to reach populations are struggling with adverse social and economic conditions. TB still carries significant stigma in many other groups because of culture or belief. Developing a network of local contacts, and working with local leaders and champions such as imams, rabbis and pastors can create pathways into otherwise difficult to reach populations. Similarly, as the voluntary and private sectors increasingly bid for local tenders in community projects, such as drug and alcohol services, it is important to do awareness raising of TB with the staff of organisations, and to provide information about the referral pathways into local TB services.	No additional information provided by stakeholder.

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
002	British Thoracic Society	Education through schools	To improve new entrant screening rates	New entrants to the UK are frequently missed by current TB screening techniques	NICE guidance suggests that multidisciplinary TB teams should help professionals working in relevant statutory organisations to raise awareness of TB among under-served and other high-risk groups by disseminating materials in ways likely to reach target groups target groups who attend regularly (NG33 1.1.1.1, 1.1.1.5, 1.1.2.1, 1.1.2.5). Schools are an untapped resource in terms of identifying new entrants to the UK who may not have registered with a GP or have understood the importance of TB screening. Language appropriate literature sent home from school with children may help to address this
003	TB Alert	Improved awareness, reduced stigma and patient-centred access to services	These issues combine to delay access in presenting to healthcare services. Delayed presentation leads to more advanced disease which can be more complex and costly to treat, result in irreversible organ damage, and in infectious cases can lead to onwards transmission of TB infection.	The time between onset of symptoms and commencement of treatment is becoming increasingly clear due to data being more comprehensively entered in the Electronic TB Surveillance system. The delay for pulmonary (i.e. potentially infectious) patients is c.75 days, hence the Collaborative TB Strategy for England calls for action to improve access to services and ensure early diagnosis.	The 2014 PHE report stated “more than a quarter (28%) of patients with pulmonary TB started treatment more than four months after symptom onset, and the proportion of cases with a delay of more than four months has increased slightly in the past 3 years”.

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
004	British Thoracic Society	Latent TB screening should be offered to new entrant children as well as adults	Although children represent as lower public health risk than adults, young children have a higher risk of preventable severe disease	The current PHE focus on latent TB screening in new entrant adults but not children is discriminatory and has the potential to miss avoidable mortality and morbidity in children	NICE states that healthcare professionals, including primary care staff, responsible for testing new entrants should test all vulnerable migrants who have not previously been checked. This is regardless of when they arrived in England. People born in countries with an incidence of more than 150 per 100,000 per year should be made a priority for latent TB testing when they arrive here (NG33 6.2.3)
005	SCM5	Proportion of eligible new entrants covered by latent TB infection (LTBI) testing programmes who accept LTBI testing	New entrant LTBI testing and treatment programmes are a key part of the Collaborative TB Strategy and it is hoped in time they will reduce the number of new cases presenting in this population	As this is a brand new programme, it is important to monitor its delivery and show that the £10million NHS England have provided to support this is well spent	The new migrant LTBI testing and treatment programme has a number of indicators that will be measured from the summer of 2016, this is just one that might be appropriate, others are: - The proportion of LTBI patients who take up treatment amongst those who have been offered it - Proportion of LTBI patients who complete LTBI treatment amongst those who start treatment There is an issue here with using this as a quality standard as LTBI testing and treatment programme are only happening in 60 Clinical Commissioning Groups across the country so this may not be an appropriate quality indicator for NICE to use?
006	SCM4		Awareness raising, rapid access to screening for Active/ LTBI in new entrants (Learning from HIV model)		No additional information provided by stakeholder.

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
007	SCM6	Key area for quality improvement 1	Latently infected HIV-positive patients are among those at highest risk of TB disease. Recent NICE guidance states that HIV-positive adults with low CD4 counts are to be offered testing for latent infection and isoniazid prophylaxis (NG33 1.2.13)	Implementation of isoniazid prophylaxis nationally has been inconsistent and liaison between TB and HIV services is highly dependent on local arrangements and relationships.	BHIVA HIV-TB co-infection audit 2008-9 http://www.bhiva.org/NationalAuditReports.aspx Isoniazid Prophylactic Therapy for the Prevention of Tuberculosis in HIV Infected Adults: A Systematic Review and Meta-Analysis of Randomized Trials. Ayele HT, Mourik MS, Debray TP, Bonten MJ.PLoS One. 2015 Nov 9;10(11):e0142290. doi: 10.1371/journal.pone.0142290. Management of latent Mycobacterium tuberculosis infection: WHO guidelines for low tuberculosis burden countries. Getahun H, Matteelli A, Abubakar I, Aziz MA, Baddeley A, Barreira D, Den Boon S, Borroto Gutierrez SM, Bruchfeld J, Burhan E, Cavalcante S, Cedillos R, Chaisson R, Chee CB, Chesire L, Corbett E, Dara M, Denholm J, de Vries G, Falzon D, Ford N, Gale-Rowe M, Gilpin C, Girardi E, Go UY, Govindasamy D, D Grant A, Grzemska M, Harris R, Horsburgh CR Jr, Ismayilov A, Jaramillo E, Kik S, Kranzer K, Lienhardt C, LoBue P, Lönnroth K, Marks G, Menzies D, Migliori GB, Mosca D, Mukadi YD, Mwinga A, Nelson L, Nishikiori N, Oordt-Speets A, Rangaka MX, Reis A, Rotz L, Sandgren A, Sañé Schepisi M, Schünemann HJ, Sharma SK, Sotgiu G, Stagg HR, Sterling TR, Tayeb T, Uplekar M, van der Werf MJ, Vandevelde W, van Kessel F, van't Hoog A, Varma JK, Vezhnina N, Voniatis C, Vonk Noordegraaf-Schouten M, Weil D, Weyer K, Wilkinson RJ, Yoshiyama T, Zellweger JP, Raviglione M.Eur Respir J. 2015 Dec;46(6):1563-76. doi: 10.1183/13993003.01245-2015.

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
008	SCM2	Diagnosis and treatment of latent TB in new entrants	Diagnosis and treatment of LTBI is recommended in NICE guidelines. If all new entrants from high incidence TB countries were screened for TB and given treatment when found to have latent TB, there would be a significant decline in the number of TB cases.	The Collaborative Tuberculosis Strategy for England lists this as one of its 10 areas for action. Although this is being implemented, the uptake is patchy and many more centres need to become involved to reduce the number of active TB cases.	PHE TB Strategy Update – issue 2 January 2016
009	SCM5	Offering LTBI treatment up to the age of 65	This is a new recommendation in the 2016 NICE guidance	Expanding the age at which LTBI is treated from 35 to 65 is a considerable change for TB teams and so using this as a quality marker could be useful to ensure this change happens	This is not collected routinely in any surveillance database and will only be found in the individual hospital databases, so may be difficult to use as a quality marker

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
010	SCM1	Improved and rapid access and diagnostics – for underserved (hard-to-reach) high risk populations.	Vulnerable, hard-to-reach populations (those experiencing homelessness, drug/alcohol dependence, imprisonment) have much higher rates of TB than the general population and have greater risk of onward transmission (Find&Treat evaluation, BMJ). With an increasing number of people experiencing homelessness (incl. rough sleepers) nationally (Crisis), rapid access to TB services and diagnosis is paramount. Poor access to services and delays in diagnosis (as indicated in key documents - NICE NG33 (recommendation 1.8.9), Collaborative TB Strategy (2015-2020), RCN TB Case Management and Cohort Review toolkit and the WHO International Standards on TB Care) for this population leads to increase in complex disease, morbidity and mortality. This key area links in with key area 5 – implementing cohort review	Lack of standardised practice means that each TB service (based within the team/organisational culture of the specific hospital/trust it is employed by) does things differently. Some services provide flexible/walk-in appointment times whilst others have rigid/fixed appointments only or require GP referral. Further services might have close collaboration with third sector/community organisations whilst some have a poor relationship with the population/community they serve. The recipe for effective TB control is to reduce delay in diagnosis (and ensure treatment completion), and access for homeless and other vulnerable high risk groups should be rapid and straightforward. Each service should be responsive to the needs of high risk, under-served populations and have local plan (pathway) in place to ensure easy access and diagnosis. Same day sputum results.	Crisis annual impact report 2015 Jit M, Stagg HR, Aldridge RW, White PJ, Abubakar I; Find and Treat Evaluation Team. Dedicated outreach service for hard to reach patients with tuberculosis in London: observational study and economic evaluation. BMJ. 2011 Sep 14

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
011		Rapid referral of imaging suggesting of TB to the local multidisciplinary TB team	The sooner the TB team make the diagnosis, the sooner the patient will start anti-TB treatment and the sooner they will begin to recover/become non-infectious. Recommended in NICE guidance.	Many patients have had symptoms of TB for months before the diagnosis has been made. Evidence from enhanced TB surveillance suggests that the length of time from symptom onset until diagnosis is increasing.	PHE TB Strategy Update – Issue 2, January 2016
012	British Thoracic Society	Sputum smears should be examined within 24 h	Those with a positive sputum smear are largely responsible for transmission of tuberculosis	Transmission of tuberculosis should be kept low or negligible	Riley et al. Am J Hyg 1959; 70: 185-196 Liipo et al. Am Rev Respir Dis1993;148(1):235-6.
013	SCM3	Rapid TB diagnosis	Rapid TB Diagnosis- currently only 60% of TB cases are diagnosed by any laboratory system (ie microscopy, bacteriological culture, molecular methodology). It is possible to diagnose TB and multidrug resistance in a few hours from patient specimens using rapid molecular technology (NAAT). Reference labs have employed rapid methods to identify cultures from NHS labs within 1 day but the time to culture remains between 2 and 4 weeks. PHE is embarking on a whole genome		No additional information provided by stakeholder.

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
			sequencing approach which at the present time will slow down the time taken for ID of cultures etc, AS WGS requires cultures it does not address the "missing" 40% or provide diagnosis and critical drug resistance data within a day from patient's specimens. Few providers are using NAATS on patient specimens despite WHO and USA CDC recommendations to do so for TB suspects. ID within a day permits Identification of TB cases, the correct isolation needed, correct treatment for patient benefit AND to prevent further transmission. Increase proportion of specimens examined by molecular detection; development of mobile facilities, availability/facilities within prisons and homeless shelters.		

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
014	SCM4		Identification/ rapid access to TB clinic for migrants, homeless and other under-served people (learning from HIV model)		No additional information provided by stakeholder.
015	SCM6	Key area for quality improvement 3	Period of infectiousness in the community is believed to be an important determinant of TB transmission. Recent NICE guidance states that rapid access referrals should be seen by the MDT within 1 and 5 days for pulmonary and extrapulmonary disease respectively. (NG33 1.8.9.8 and 1.8.9.9)	Arrangements for rapid access to TB services are variable in different regions and time to specialist assessment is not a formal feature of cohort review. Data on this aspect of care are thus limited at present but could easily be audited.	Cootauco MB Nurse-led rapid diagnosis and management of TB Nursing Times http://www.nursingtimes.net/nurse-led-rapid-diagnosis-and-management-of-tb/1794335.article
016	SCM2	Diagnosis of pulmonary TB in children	Confirming TB in children can be difficult but it is important to obtain as much information as possible, especially if there is no obvious source of the TB. Recommended in NICE guidance	TB in children is often paucibacillary but it is nonetheless important to make an effort to confirm TB and find out the sensitivities of the organism, as in adults.	The number of culture confirmed cases in children is much lower than in adults.

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
017	British Thoracic Society	Standards on collection of samples for culture in children	To ensure all the relevant information is available to optimise a child's care	Children's care may be compromised by the failure to collect appropriate samples prior to treatment. Risk vs benefit ratios are not always easy to balance in children and specialist service such as induced sputum / biopsy under general anaesthetic in a child may only be available in tertiary centres	NICE provides clear guidance on microbiology sample collection for TB at different sites (NG33 1.3.1). In children who may require a general anaesthetic for investigation or have hilar lymphadenopathy only, the risk vs benefit ratio for collecting samples when the sensitivities of the index case are known needs to be carefully balanced. Nevertheless there are situations where sample collection is essential (erg. uncertain diagnosis, prior TB treatment, unknown sensitivities) and it is important that those treating children with TB are clear about when sample collection is always necessary even if it requires referral of the child to another hospital
018	Royal College of Paediatrics and Child Health	Key area for quality improvement 1: The NICE document on tuberculosis should contain a section on diagnosis and treatment of tuberculosis in children.	There are significant physiological differences between adults and children who make up one fifth of the population (young children have a developing immune system which can lead to more severe progression in TB).	Diagnosis and treatment of adults and children differ to some degree. Extra-Pulmonary TB is more common and body fluids other than sputum may be more appropriate (urine, blood quantiferon gold test). Drug treatment may also very in duration.	Reference: Comparison between childhood and adult tuberculosis in a rural tuberculosis unit of West Bengal: A retrospective study http://europepmc.org/articles/PMC3999669 Ranadip Chowdhury1, Tapas Das2, Rajib Dutta3, Abhijit Mukherjee4, Indranil Saha5, Rupak Singla6

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
019	British Thoracic Society	Key area for quality improvement 14 Sputum testing at 2 months should occur	Drug resistance occurs when there are large number of bacilli and treatment is just with two drugs	The continuation phase of treatment should not be started in those with pulmonary tuberculosis unless the sputum smear is negative, the results of drug sensitivity testing are known and there are clinical data to show improvement. If these do not occur, there is the danger of developing drug resistance.	e.g. Cardosch et al. PLoS Comput Biol 2016; 12(3): e1004749. Perfura-Yone et al. BMC Infect Dis 2014; 14: 138.
020	British HIV Association (BHIVA)	General comments			The Association suggests that the point to be made relates to ensuring that HIV testing is routinely offered to all people with active TB. BHIVA suggests that it would also be useful to know the result of such HIV tests and for these to be recorded.
021	British HIV Association (BHIVA)	General comments on HIV testing			*The current evidence from the attached info in the quality standards (taken from the "Public Health England (2014) Tuberculosis in the UK: annual report"): "HIV testing* *In 2013, information on HIV testing was known for 81% of cases whose HIV status was not previously known (6,205/7,616). Of these, 88.5% of cases (5,490) were offered and received HIV testing, 6.8% of cases (424) were not offered testing, and 4.7% (291) were offered HIV testing but did not receive it, of which 1.7% (106) declined. A high proportion of children aged 0 to 14 years old were not offered HIV testing (35%, 78/221. Data on HIV status is not collected in the surveillance system. Information on the proportion of TB cases*

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					aged 15 years and older with HIV is obtained by record linkage between the national TB and HIV datasets. For 2012 data, this information will be available later in the year after record linkage has been completed." *However, HIV testing does not appear to be mentioned in the "Public Health England (2015) Reports of cases of tuberculosis to enhanced tuberculosis surveillance systems: UK, 2000 to 2014".*
022	SCM5	Use of rapid diagnostic nucleic acid amplification tests (NAATs) for rifampicin resistance if risk factors for multi-drug resistant TB (MDR-TB) are identified	This is a key recommendation in NICE guidance, but is not readily available all over the country	As NAATs are not always readily available, including it as a quality indicator might help improve their availability and would assist in the faster diagnosis of MDR-TB and theoretically a reduced likelihood of onward transmission	No additional information provided by stakeholder.
023	SCM6	Key area for quality improvement 2	MDR-TB has risen to 1.6% of TB cases in the UK. Delay in diagnosis may have serious consequences for the patient and for infection control. Recent NICE guidance states that all patients with risk factors should have rapid NAAT and isolation in a side or negative pressure room.	A simple risk assessment captures those at highest risk and should be a good composite indicator of awareness, diagnostic efficiency and infection control procedures in inpatient facilities.	The clinical impact of nucleic acid amplification tests on the diagnosis and management of tuberculosis in a British hospital. Taegtmeyer M, Beeching NJ, Scott J, Seddon K, Jamieson S, Squire SB, Mwandumba HC, Miller AR, Davies PD, Parry CM.Thorax. 2008 Apr;63(4):317-21.

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
			(NG33 1.5.1.4)		
024	SCM3		Standards/measures to address the social, behavioural and economic issues around enforced isolation of drug resistant cases e.g. impact on patients; family life where parents are isolated, security of employment whilst treated, mental health and all subsequently on the economic cost of treatment and economic cost to the patient. These issues may lead to refusal to engage with the health and public health services, increase treatment failure and costs.		No additional information provided by stakeholder.
025	British Thoracic Society	Patients with mono-drug resistant TB should be routinely managed by a clinician with experience in this area.	There is some evidence that patient outcomes are better when they are managed by an experienced clinical team.		NICE NG 33 1.4.2.2 also recommends this.

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
026	British Thoracic Society	Patients with multi-drug resistant TB should be discussed with the BTS MDR-TB advice service.	The completion rates and lost to follow rates in MDR are poorer than that of drug sensitive cases.	There are an overall small number of cases in England (56 in last PHE report) so that the number of cases treated by individual physicians may be low and such cases may also occur in some low incidence TB areas where local teams may have less experience in treating TB. The Advisory Service allows for peer review and advice directly from experts and is already a model advocated in Europe.	Please see: National TB report PHE 2015 Jordan TS, Cullen D, Davies PD. A centralised electronic Multidrug-Resistant Tuberculosis Advisory Service: the first 2 years. Int J Tuberc Lung Dis 2012; 16: 950–954. Blasi F, Dara M, van der Werf MJ, et al. Supporting TB clinicians managing difficult cases: the ERS/WHO Consilium. Eur Respir J 2013; 41: 491–494. MDR TB Service 2014 survey BTS. Lange C et al. Management of patients with multidrug-resistant/extensively drug-resistant tuberculosis in Europe: a TBNET consensus statement. Eur Respir J. 2014 Jul;44(1):23-63.
027	SCM6	Additional developmental areas of emergent practice	While local MDTs are well-established, review of the most complex MDR-TB cases at a regional or national level potentially offers a higher level of skill-sharing and experience. In a complex clinical area. NICE recently suggested establishment of regional MDR-TB network and expert centres (NG33 1.8.3.1)	Management of MDR-TB patients for many physicians and nurses is often based on limited experience. While clearer management guidelines now exist, a wider support and expertise network has clear potential to improve quality of care for these more exacting patients and through this process, TB clinical management more generally.	

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028	SCM1		Comprehensive contact tracing is recommended by NICE (NICE NG33 recommendation 1.6) and is a key indicator in the Collaborative TB strategy (2015-2020). Effective contact screening will improve early diagnosis and prevent further transmission (Collaborative TB strategy 2015-2020). Mechanisms must be in place to ensure identification, screening and follow-up of community as well as house-hold contacts, such as using mobile screening units and utilising the skills of peers and outreach workers for raising awareness and improving identification, screening and follow-up of contacts.	Identifying and screening contacts on the whole is poor. Cohort review in London has revealed that all too often a very low number of (close) contacts are identified, screened and followed-up. Priority of the need to screen contacts is based on infectiousness of index case (smear +, PTB, culture +…) and susceptibility of contacts, but in an unfortunate twist it seems that, in some instances, the more infectious a patient is, the fewer contacts have been identified and followed-up. To ensure accountability and close monitoring of number of contacts identified and managed, this key area links in with area 5 – implementing cohort review.	No additional information provided by stakeholder.

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
029	SCM5	Screening of an average of 5 close contacts per pulmonary TB case	TB contact screening is an important part of TB case management as it can lead to the diagnosis of further active cases and those latently infected with TB, so enabling early, appropriate treatment to be offered and so prevent onward transmission of TB	Contact screening is routinely undertaken by TB teams however there is considerable variation in the extent to which it is undertaken and it rarely attains an average of 5 close contacts per pulmonary TB case, so this quality marker should help improve contact tracing practises	The Collaborative TB Strategy for England (2015-2020) recommends comprehensive contact screening in its 'area for action 4' Some years ago a similar standard was set by the New York City Health Departments TB Service and led to marked improvement in TB contact tracing and with time supported their much improved TB control
030	SCM1	Enhanced Case Management (ECM) and DOT	Adherence is affected by socio-economic factors (WHO – International Standards on TB care), and good comprehensive ECM will help improve adherence, treatment completion and reduce loss to follow-up (NICE NG 33, RCN TB Case Management and Cohort Review toolkit). Indeed, a profiling exercise carried out in 2004 by the London TB workforce found that patients with social risk factors account for a much higher proportion of drug resistance, are more likely to be infectious and account for half of all cases lost to follow-up (TB workforce profiling exercise, Story. A et al).	Even if a patient is assessed as having social risk factors and in need of ECM, it does not mean the patient will receive an adequate/appropriate level of care. For instance, a DOT survey carried out by the London TB workforce in 2009 and repeated in 2014* revealed that only half of patients assessed as requiring DOT actually got DOT. ECM needs to consist of DOT and a package of care designed to meet the patient's needs. All clinically or socially complex TB patients must receive ECM to ensure same outcomes (completion rates) as for patients without risk factors. ECM requires a multidisciplinary approach, involving in-house TB outreach/case workers if practical, and/or have pathway/access to external/specialist allied agencies. *can provide data/figures for this if	Story A, Murad S, Roberts W, Verheyen M, Hayward AC; London Tuberculosis Nurses Network. Tuberculosis in London: the importance of homelessness, problem drug use and prison. *Thorax*. 2007 Aug;62(8):667-71

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
			ECM must start from point of access not diagnosis. Patients with LTBI also require ECM ECM is recommended by a number of key documents/guidelines, incl.: NICE NG33 (recommendation 1.7), TB strategy (2025-2020) and RCN Case Management and Cohort Review toolkit. This key area links in with area 5 – implementing cohort review	requested.	
031	SCM6	Key area for quality improvement 4	Adherence to therapy may be influenced by support and supervision arrangements. There have been numerous recent developments in this area, particularly using mobile and other electronic technologies. Recent NICE guidance states that all patients should have an Identified case manager and treatment plan and that this should include use of reminder systems (NG33 1.7.11)	Treatment success rates vary between regions and MDTs. Patient reminder systems and identification of an identified case manager could be important factors in this variability.	Reminder systems to improve patient adherence to tuberculosis clinic appointments for diagnosis and treatment Liu Q, Abba K, Alejandria MM, Sinclair D, Balanag VM, Lansang MA.Cochrane Database Syst Rev. 2014;11:CD006594. Doi: 10.1002/14651858.CD006594.pub3

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
032	SCM7	DOT	DOT works well on many levels, and should be offered on the basis of an initial risk assessment, rather than when adherence has declined. Team case workers or dedicated DOT workers should be involved with the most complex patients, and DOT is a good way of getting to know patients, building up positive relationships and then giving individualised support to the patient.	A diagnosis of TB can, ironically, be a turning point for some patients. Seeing a patient for daily/thrice weekly DOT over six or more months of treatment is a long enough period of time to be able to develop a positive relationship with the patient and to work with him on important issues and problems which may also be a barrier to treatment completion.	No additional information provided by stakeholder.
033	British Thoracic Society	Provision of 7 day a week directly observed therapy for pulmonary TB patients with social risk factors and those with drug resistant disease.	Patients with social risk factors are less likely to complete TB treatment than others. Treatment for drug resistant TB (including mono resistant disease) is complex. Often fixed dose combination drugs can't be used. Providing 7 days a week support for these patients could improve completion rates and have the public health benefit of making patients non-infectious quicker.		NICE NG33 1.7.1.3

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
034	SCM4		Contact tracing and multidisciplinary TB support (Incl. DOT and non-clinical support)		No additional information provided by stakeholder.
035	SCM5	TB Services to show improved TB treatment completion for under-served populations	By measuring the proportion of drug-sensitive TB cases with at least one social risk factor who complete treatment one is indirectly measuring improved care of under-served populations and this in turn should help to reduce health inequalities for this group	One of the stated aims of the TB Strategy is to reduce health inequalities and this would be an indirect way of measuring this	The proportion of drug-sensitive TB cases with at least one social risk factor who completed treatment within 12 months is a Collaborative TB Strategy for England indicator (available in the PHE TB fingertips tool)
036	SCM2	Multidisciplinary TB support	This is important particularly for patients in under-served groups who have complex social and clinical needs. This includes skilled outreach and advocacy workers to address patients' housing, asylum, welfare, immigration, substance dependency and other health and social care needs. Recommended in NICE guidance.	Many patients with TB belong to under-served groups and TB nurses are often left trying to sort out social care needs with little support. Professional, skilled workers should be part of every TB MDT to ensure that patients receive the correct support and advice for the problems that may prevent adherence to treatment or may result in poor clinical outcomes.	Collaborative TB Strategy for England p7 shows the number of TB case reports by deprivation quintile.

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
037	SCM7	Workforce development	All TB teams should be multidisciplinary, with a work force that matches the needs of their patients and local demographics.	TB teams should ideally have the capacity to offer more than treatment alone. The best way to do this is to have a workforce with mixed skills. TB teams also need to develop local networks with other statutory and TSO services, in order to work jointly on health and other issues that affect patients. TB is not a 'stand-alone' disease, and a significant minority of patients will have multiple problems that could be addressed during the course of TB treatment. These can include homelessness, addictions, migrant status, unemployment, lack of benefits and other major health problems such as HIV and other BBVs. The length of time for TB treatment (minimum 6 months) is a reasonable length of time for achieving positive and sustainable change in the lives of patients with complex needs.	No additional information provided by stakeholder.
038	SCM7	Capacity to offer more than treatment alone	As above, TB is a 'social' disease, and many patients struggle to adhere to treatment because their lives are complex and/or chaotic. Nurses are increasingly feeling they have to support patients in non-clinical issues such as housing, benefits, legal	There is a lot of literature around adherence, especially with regard to psychiatric patients, and patients who want to stop smoking, although it remains controversial in some instances, especially when the incentive is in the form of cash. We offer non-cash incentives such as housing, travel passes and food, and this works very well as an encouragement for adherence and completion of treatment.	No additional information provided by stakeholder.

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			status and so forth. A mixed work force that includes a skilled case worker or equivalent releases clinical staff from these responsibilities, as well as creating positive relationships and encouraging adherence.	TB teams cannot alter local conditions of social and economic hardship and deprivation, but a mixed skills workforce can alter circumstances for the individual patient.	
039	British Thoracic Society	To ensure safe staffing is accomplished for commissioning of local TB teams	To ensure appropriate staffing is achieved in all TB services to be able to deliver case management and the major components of managing active and latent TB. Including enhanced case management.	There is evidence of inadequate staffing despite longstanding national guidance. This is central to delivering TB care.	Public Health Action Support Team. London TB Service Review and Health Needs Assessment. September 2010. Bothamley GH, Kruijshaar ME, Kunst H, et al. Tuberculosis in UK cities: workload and effectiveness of tuberculosis control programmes. BMC Public Health 2011;11:896. doi:10.1186/1471-2458-11-896 1.8.7.2 Commissioners should ensure NHS England's safe staffing principles are applied when commissioning TB services[2],[3].[new 2016] Ref 3 - NICE's 2012 guideline on tuberculosis: identification and management in under-served groups recommended 1 WTE case manager per 40 incident cases needing standard management and 1 WTE case manager per 20 incident cases needing enhanced case management

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040	TB Alert	Provision of integrated clinical and social care	The standard course of treatment for TB lasts six months and comprises a high pill burden with a range of side effects. Incomplete treatment is the primary driver of drug-resistant strains of TB, treatment for which is very lengthy and expensive increases anti-microbial resistance. In order to maximise patients' chances of completing their course of treatment, their psycho-social as well as clinical care needs must be recognised, understood and addressed. This includes housing, food and funds to travel to clinic.	England still does not reach WHO/international treatment completion benchmarks. Successful treatment requires integrated clinical and social care and with responsibility for general social care now falling outside the NHS and into local authorities there is a risk of fragmented services which are not patient-centred. Very few localities have strategies in place to meet these needs.	Treatment completion data at https://www.gov.uk/government/statistics/reports-of-cases-of-tuberculosis-to-enhanced-tuberculosis-surveillance-systems-uk-2000-to-2014 NICE NG33 recommends that multidisciplinary teams have "access to funds through local government and clinical commissioning groups that can be used flexibly to improve adherence to treatment among under-served groups. For example, funds could be used to provide transport to clinics, to provide support or enablers for treatment, or for paying outreach workers or community services to support directly observed therapy. Funds may also be used to provide accommodation during treatment".

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041	TB Alert	Improved workforce planning.	An appropriately resourced and skilled multi-disciplinary team is essential to ensure effective passive and active case finding, prompt and accurate diagnosis, effected treatment and treatment support, and appropriately targeted and delivered prevention strategies.	With the nurse:patient ratio taken out of NICE guidance in NG33, it is critical that workforces are monitored to meet local need. Workforces are not currently surveyed but North West England's cohort review last year showed only one of 19 services as meeting the nurse:patient ratio that was then in NICE guidance. With the additional workload of patients with latent TB, emerging through the new nationally funded post-entry screening programme, there is heightened risk of nurses not having the capacity to manage their caseload of patients with active disease.	The Collaborative TB Strategy For England says "TB control boards should plan, oversee, support and monitor local TB control, including clinical and public health services and workforce planning."
042	SCM3		Appropriate staff ratios for doctors, nurses, field workers and lab staff to ensure sufficient case workers to effectively manage and treat all cases especially complex and drug resistant cases.		No additional information provided by stakeholder.
043	SCM5	Ensure TB Control Boards and TB Services are working to a localised version of the national TB Service Specification	The national TB service specification outlines what a comprehensive TB Service should provide and if adhered to should improve TB services across England and so improve TB control	This is a key area for improvement as the specification is new and will if used improve quality in many different areas	The Collaborative TB Strategy for England (2015-2020) recommended the development of an evidence-based model TB service specification. A national TB service specification was completed at the end of 2015 and shared with TB Control Boards to localise. The service specification recommends that NICE guidance is followed

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044	SCM1	Quarterly Cohort review – ensure the implementation of cohort review	Cohort review is an essential method of service evaluation and provides an opportunity to systematically review the management of *all* patients.	Recommended by NICE NG33 (recommendation 1.8.3), the RCN TB Case Management and Cohort Review toolkit and Collaborative TB strategy (2015-2020), a well-structured, organised cohort review is an opportunity to monitor and review the four areas for quality improvement identified above, linking in with local and national targets/standards. It helps ensure accountability and standardisation of quality of care, and will highlight gaps/themes/issues on an individual, local and service level. Adopting a multi-professional approach, cohort review can also identify social risk factors/issues that impact on treatment that the LTBR/ETS does not. Assessments are an on-going process not a one-off piece of work	No additional information provided by stakeholder.
045	SCM2	Additional developmental areas of emergent practice Cohort review	Cohort review is a relatively recent introduction in England but many areas have taken it up enthusiastically as it ensures accountability and improves TB control. Recommended in NICE guidance.	Some areas have a well established and well-run cohort review process but other areas find it more difficult. Engaging clinicians in the process and encouraging them to attend is an on-going challenge and some nurses feel they are being criticised, particularly if they have no clinician support during presentation of their cases.	https://www2.rcn.org.uk/__data/assets/pdf_file/0010/439129/004204.pdf
046	SCM4		Enhanced and multi-professional cohort review to include third sectors		No additional information provided by stakeholder.

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			input		
047	SCM5	TB Services to participate in TB Cohort Review on a 3-4 monthly basis	There is evidence that participation in TB Cohort Review leads to locally driven improvements in the quality of TB patient care. Participation of TB Services in TB Cohort Review is recommended in NICE guidance and the Collaborative TB Strategy for England	Informal collation of those undertaking TB Cohort Review suggests that this is increasing nationally but a quality standard recommending this would further ensure it takes place	The London TB Register team (part of PHE London – Field Epidemiology Service) presents this information quarterly in its 'TB in London Quarterly Surveillance Report'
048	SCM6	Key area for quality improvement 5	Review of MDT outcomes is a key opportunity for audit and learning within the team. Recent NICE guidance recommends quarterly cohort review (NG33 1.8.2.4)	Roll-out of cohort review has proceeded at different rates across regions with differing arrangements. Effectiveness of cohort review could be a good global indicator of quality of MDT working.	Raising standards in UK TB control: introducing cohort review. Anderson C, White J, Abubakar I, Lipman M, Tamne S, Anderson SR, Dekoningh J, Dart S. Thorax. 2014 Feb;69(2):187-9. doi: 10.1136/thoraxjnl-2013-203751. North-West TB Summit outcomes 2013-14 available at https://tbsummit.wordpress.com/

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049	SCM2	Investigation and management of TB in children	The number of cases of TB in children is small, but they should receive the best possible care by experienced clinicians. Recommended in NICE guidance.	Children with TB may be diagnosed and managed initially by a clinician with little or no experience but referred to a tertiary centre when problems arise. It is often apparent that the initial investigations required have not been carried out correctly and management has often been handled badly. This can have an adverse effect on the child's clinical outcome and sometimes leads to a longer or more complicated treatment regime for the child.	There is little information about TB in children. The North West TB Control Board is trying to establish a TB pathway for children to address these issues.
050	British Thoracic Society	Clearer guidance about the organisation of services involved in the investigation and management of children	There is marked heterogeneity in the care children receive across the UK	The quality of care for children should not be compromised just because it is difficult to organise	NICE emphasises the importance of children being investigated and managed by either a paediatrician with experience and training in TB or a general paediatrician with advice from a specialised clinician (NG 1.3.4.3). It would be helpful to have guidance on what level of experience and training is required for paediatricians to act as an expert. I would suggest that no paediatric TB service should be functioning in isolation, and that close links with adult teams are essential to maintain high quality care. Similarly, adult physicians should not be caring for children in isolation.
051	SCM4		Proper management of TB in children including their parents and careers support		No additional information provided by stakeholder.

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052	Royal College of Paediatrics and Child Health	The NICE document on tuberculosis should contain a section on diagnosis and treatment of tuberculosis in children.	There are significant physiological differences between adults and children who make up one fifth of the population (young children have a developing immune system which can lead to more severe progression in TB).	Diagnosis and treatment of adults and children differ to some degree. Extra-Pulmonary TB is more common and body fluids other than sputum may be more appropriate (urine, blood quantiferon gold test). Drug treatment may also very in duration.	Reference: Comparison between childhood and adult tuberculosis in a rural tuberculosis unit of West Bengal: A retrospective study http://europepmc.org/articles/PMC3999669 Ranadip Chowdhury1, Tapas Das2, Rajib Dutta3, Abhijit Mukherjee4, Indranil Saha5, Rupak Singla6
053	TB Alert	Partnerships with and appropriate commissioning of third sector stakeholders	Third sector organisations can have deep understanding of, trust of and access to communities affected by TB, including vulnerable migrants within NICE's (NG33) definition. They can increase awareness, reduce TB-related stigma and provide psycho-social support to patients.	Third sector organisations have not historically been seen as key stakeholders in TB, and where they are it is often expected they will contribute on a voluntary basis. The social complexity of TB means the third sector has unique roles it can play, but for it to be a professional basis with impact on the scale necessary, it needs to be on a commissioned basis. Comparisons to similar countries suggests that a lack of involvement of such non-statutory stakeholders results in poorer access to care, worse treatment outcomes and less efficient use of clinical staff time.	The Collaborative TB Strategy for England identifies the critical importance of bringing together all the local agencies, including third sector partners, in order for the strategy to succeed. NICE NG33 (1.8.8.4) calls for commissioning and training of third sector organisations. The Collaborative TB Strategy identified the third sector as a partner for whom appropriate contracting and training is required.
054	SCM1	Accommodation during treatment – ensure the provision of accommodation for TB patients who are not entitled to state benefits/housing.	As the number of cases from Romania and other Eastern European Countries increases (TB in England Annual Report 2015, PHE), the numbers of patients with no recourse to public funds* will increase also. Data	Despite access to accommodation being a NICE recommendation not all TB patients in need of accommodation receive funding/support to access housing. A large proportion of the patients with active TB referred to Find&Treat (a pan-London TB outreach team) as lost to follow-up are homeless*. With the exception of	

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			shows that in London 1 in 10 patients (in some London Boroughs it is 1 in 3) have social risk factors, predominantly homelessness and drug/alcohol dependence (TB in England Annual Report 2015, PHE). Patients who are homeless (especially those rough sleeping) will find treatment increasingly difficult to manage, leading to prolonged/incomplete Rx, loss to follow-up and death. Stable/secure housing (during treatment) is a pre-requisite to successful treatment completion, and NICE NG33 (recommendation 1.8.11) recommends that accommodation should be funded for patients who are otherwise ineligible. *No entitlement to benefits/housing	Hackney, as there is no a standardised pathway for providing accommodation in London, funding (by local CCG) is agreed on a case-by-case basis, and many patients are refused. Attempting to obtain funding/access to housing can be a long, drawn-out process, and mechanisms/measures/pathways must be in place to make this more straightforward and ensure equity of service. *can provide data/figures if requested.	

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055	SCM7	Accommodation	Housing is probably the most common factor for lost to follow up/non-completion of treatment. Access to accommodation for homeless patients via an agreed local pathway can transform a team's ability to maintain certain patients on treatment. At the moment, TB staff are having to negotiate housing for each homeless patient on an individual basis, making a persuasive case to local CCGs etc. This takes up a lot of time, during which the patient may be bed blocking, or become lost to follow up.		
056	British Thoracic Society	Suitable accommodation should be provided for patients with TB including those with no recourse to public funds.	It is more difficult for patients to complete treatment if they do not have stable suitable accommodation. There are possible infection control issues for homeless and hostel dwelling patients. It is not appropriate or economically sound for TB patients to spend long periods hospitalised in acute medical beds due to		1.8.11.3 Local government and clinical commissioning groups should fund accommodation for homeless people diagnosed with active TB who are otherwise ineligible for state-funded accommodation. Use health and public health resources, in line with the Care Act 2014.[2012, amended 2016] [2012, amended 2016]

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			lack of suitable accommodation. NICE NG 33 1.8.11		
057	SCM3		Appropriate accommodation for homeless and multidrug resistant TB patients. Currently the default option is the NHS. Lack of non-NHS hostel type care increases treatment costs, reduces efficacy (as homelessness etc increases loss of patients to follow up meaning that infectious cases continue to infect and through piecemeal treatment encourages further development of antimicrobial drug resistance. Small initiatives e.g. for east European migrants hostel in North London.		No additional information provided by stakeholder.
058	SCM4		Compulsory access to practical help (accommodation, foods and advice) for people with NRPF during their treatment period		No additional information provided by stakeholder.

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059	SCM5	Achieving TB treatment completion of >85%	This is one TB quality marker in the Public Health Outcomes Framework	This is a quality marker set by WHO for TB	Public Health Outcomes Framework This is an existing indicator available on line in the PHE TB Fingertips tool as one of the PHE TB Strategy Indicators
060	British Thoracic Society	Improve availability of BCG	Reliable access to BCG needed to run effective vaccination programmes	Prevention of TB by BCG vaccination is a key part of the NICE NG33 guideline	NICE stresses the importance of BCG vaccination in infants and children from high risks groups (NG33 1.1.3). This recommendation cannot be followed without reliable access to BCG.
061	Devon County Council	Best test for contacts	There are two commonly used blood tests and the Mantoux skin test, which is optimum in particular circumstances (or what combination)	Every contact tracing exercise throws up a few 'equivocal' tests in contacts and it is sometimes difficult to know how to manage these people.	No additional information provided by stakeholder.
062	SCM7	Additional developmental areas of emergent practice Dual diagnosis: TB and mental health	Mental health and acute hospital trusts exist separately, and this can create difficulties when a patient has a dual diagnosis.	1. Who should take primary responsibility for mentally ill patients with TB? 2. Where is the best place for them to be? 3. Current admission protocols dictate that a physical illness should be treated before mental illness when both are present. However, if a patient is non-compliant with TB treatment because of his delusions, this becomes extremely difficult. If a patient is on a MH section, he can be treated against his will for his mental illness, but not for any physical illness. If the patient is smear+ve he cannot be admitted to a psychiatric ward, but if he is mentally unwell and	No additional information provided by stakeholder.

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				refusing treatment there are no powers to force him to accept treatment.	
063	British Thoracic Society	Randomised controlled trials should form the basis of NICE guidance in Tuberculosis	There is good evidence that expert opinion can be inaccurate and misleading	The majority of changes since 2006 have increased the complexity of the guidance without adding a great deal of unbiased evidence. A summary document should include only Grade A and B evidence based recommendations.	NICE Grade A and B recommendations in the new guideline do not differ significantly from previous editions.
064	British Thoracic Society	Management structures can support quality care, but unless evaluated should not be included in NICE guidance	There is excellent evidence that systems already employed outside of the UK have contributed to reducing the incidence and improving the treatment outcome of tuberculosis worldwide (WHO Annual Reports)	The recent NICE guidance updated from 2011 includes an inordinate amount of advice, often contradictory and without improvement on other tried and tested advice of international standing such as the Orange Book of the International Union Against Tuberculosis and Lung Disease. All organizational aspects of TB care should be subsumed in an appendix and removed from the main document unless supported by good quality evidence (Grade A or B)	In the recent guidance, most descriptions of organizational aspects are expert opinion only (and not transferable to the international community, who have been important users of NICE guidelines).
065	Devon County Council	Contact tracing	Current guidance on who to include in contact tracing is quite permissive and is open to ‘strict’ interpretation as well as ‘liberal’ interpretation	There is a risk of both not extending contact tracing far enough (being strict about only testing household contacts, and being strict about the definition of household) and being too inclusive, so that costs become uncontrolled and positive contacts might represent the background prevalence rather than being related to the index case	No additional information provided by stakeholder.

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066	British Thoracic Society	Interferon-gamma release assays for the detection of latent tuberculosis infection should give the actual values	There is a grey zone, acknowledged by the manufacturer for T.SPOT.TB and calculated on the basis of conversion-reversion tests for QuantiFERON such that clinical judgment is important in determining who should receive preventive treatment	The wider population screened by these tests and offered preventive treatment may lead to unnecessary treatment for those with a value in the Grey zone. Those tested need to be aware of this area for an informed decision regarding preventive treatment. The standard operating protocols for these tests require the reporting of exact values (spots or interferon gamma IU/mL) and not just positive/negative.	Banaei et al. J Clin Microbiol 2016; pii: JCM.02803-15 Pai et al. Clin Microbiol Rev 2014; 27: 3-20.
067	British Thoracic Society	Additional developmental areas of emergent practice – Specimens with evidence of rpoB mutations should be followed by PCRs for other first line and second-line drugs	A rational choice of drugs should be made, which avoids treating with a standard regimen where perhaps only one or two drugs are effective.	If the number of drugs used for treating drug-resistance is too low, further resistance may arise.	Helb et al. J Clin Microbiol 2010; 48: 229-37.
068	[British HIV Association (BHIVA)]	General comments on HIV testing			BHIVA would welcome discussion on how to test for TB in HIV infected individuals.
069	British HIV Association (BHIVA)	General comments			BHIVA is grateful for the opportunity to comment on this topic.

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070	British HIV Association (BHIVA)	Reference for BHIVA guidelines			http://www.bhiva.org/documents/Guidelines/TB/hiv_954_online_final.pdf Please note that an update of these guidelines is currently being prepared by BHIVA
071	Royal College of Nursing	There are no further comments to make on this document on behalf of the Royal College of Nursing			No additional information provided by stakeholder.
072	The British Society for Antimicrobial	Members of The British Society for Antimicrobial Chemotherapy (BSAC) have no comments for this Quality standard topic engagement exercise – Tuberculosis.			No additional information provided by stakeholder.
073	Royal College of Physicians (RCP)	The RCP is grateful for the opportunity to respond to the above consultation. We would like to formally endorse the response submitted by the			No additional information provided by stakeholder.

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		British Thoracic Society. I would be grateful if you could confirm receipt.			
074	NHS England	Thank you for the opportunity to comment on the above quality standard. I wish to confirm that NHS England has no substantive comments to make regarding this consultation. Mrs Celia Ingham Clark, Director for Reducing Premature Mortality, has queried if the topic will cover the management of drug resistant Tuberculosis as the overview paper doesn't say so explicitly.			No additional information provided by stakeholder.