Section 1: Information about Tuberculosis

Tuberculosis (TB) in the UK represents a major public health challenge. The UK has some of the highest TB rates in Western Europe, with 9000 diagnosed cases reported in 2011 and an incidence rate of 14.5 cases per 100,000 population (Health Protection Agency (HPA), 2012).

In accordance with the World Health Organisation’s definition of high TB incidence (any country / territory with an estimated incidence rate of 40 cases per 100,000 population), Manchester is currently classified as an area of high TB incidence and the late diagnosis of TB is of particular concern locally and nationally.

In 2011, 26% of cases in England were only diagnosed on admission to hospital (HPA, 2012). The high incidence and late diagnosis of TB in Manchester highlights the need for a proactive response that aims to both halt and reverse this upward trend.

To treat and control TB effectively, the following measures are required:
- the early diagnosis and treatment of active tuberculosis
- the identification and treatment of latent (dormant or ‘hidden’) tuberculosis
- active case finding / screening
- Bacillus Calmette-Guérin (BCG) vaccination programme.

The policy context regarding the treatment and control of TB is framed by a National TB action plan, supplemented by NICE guidance on the clinical diagnosis and management of TB, and measures for its prevention and control.

There is additional guidance that specifically addresses identifying and managing TB among ‘hard to reach’ groups and the Department of Health has produced a toolkit for the planning, commissioning and delivery of TB services in England. The importance of reducing TB incidence and improving treatment completion for TB is also recognised in the Public Health Outcomes Framework 2013-16.

Locally, the Strategic Plan for the Prevention and Control of TB (2011) details the action needed in Manchester to reduce incidence rates in the City, as does the Director of Public Health’s 2011 Annual Public Health Report.

There is national recognition of the need to identify Latent TB Infection (LTBI) at an earlier stage, and Public Health England are currently in the process of developing a policy proposal to the UK National Screening Committee for the development of a screening programme among new entrants to the UK aged 16-35 from areas of very high TB incidence (>150 per 100,000).

The consistently high rates of TB in Manchester were first highlighted in 2008 and continue to demand a comprehensive response and commitment from all relevant agencies involved in the commissioning and provision of high quality services designed to prevent and control TB. Action taken locally will also aspire to meet several of the strategic aims of Manchester’s Health and Wellbeing Board.
• getting the youngest people in our communities off to the best start  
• educating, informing and involving the community in improving their own health and wellbeing  
• providing the best treatment we can to people in the right place at the right time  
• bringing people into employment and leading productive lives

**Section 2: How big is the problem and who is affected?**

Tuberculosis is an infectious disease that is both curable and preventable. Once diagnosed, it can be effectively treated and cured. Despite the fact that it is curable, TB is the second most common cause of death globally from an infectious agent after HIV/AIDS (WHO, 2010). Only those with active TB are infectious to others, and it is commonly held that a person with untreated Pulmonary TB will infect an average of 10-15 other people annually. Usually the risk of transmitting infection is low and only those in close contact, such as family members, are normally at any significant risk. Non-pulmonary TB is only very rarely a source of infection, and latent TB is never infectious.

Although most TB is curable with a safe combination of antibiotics, the burden of disease is significant, even with timely diagnosis and appropriate therapy. However, because of its late onset and non-specific early symptoms, TB is frequently diagnosed late and late diagnosis is associated with significant morbidity and mortality.

TB is a problem that primarily affects Black and Minority Ethnic (BME) communities in Manchester and is closely linked to demographic change and patterns of migration, with most cases the result of reactivation of latent TB acquired overseas, often in childhood, in countries where TB is still highly prevalent. The number of new TB cases in Manchester has continued to rise over the last decade, and the TB incidence rate is three times the national average at 45.9 per 100,000 population (HPA, 2012). Whilst the number of cases nationally has stabilised, Manchester’s incidence rate has continued to rise. In the UK, TB is predominantly an urban disease that is prevalent in areas where there is overcrowding, deprivation, poverty and an inward migration of people from countries that have high rates of TB.

231 cases of TB were reported in Manchester in 2011, with 80% of cases known to have been born outside of the UK. The majority of these cases were from individuals born in South Asian or Sub Saharan African countries, and 60% were in the 15-44 yrs age group. Nationally, only 23% of cases were diagnosed within two years of entry to the UK (Ormerod, 2013), though the majority of TB cases become ill within 5 years of entry to the UK (HPA, 2011).

The fact that health risks can continue many years after entry to the UK for the non-UK born is an important consideration in the planning and provision of TB services locally. In 2011, the rate of TB nationally among people not born in the UK was more than 20 times higher than the rate of TB among people born in the UK.

A sharp increase of TB in children in Manchester also points towards increasing levels of local transmission.
Trends in total new TB cases seen by hospitals in Manchester, 2003 to 2011

Trends in number of new cases of TB in children seen by hospitals in Manchester, 1996 to 2011

Ethnicity of new TB cases by hospitals in Manchester, 2001 to 2011

Source: Annual Report 2011, TB Unit, Manchester Royal Infirmary.

Unlike other comparable major cities, Manchester appears to have a relatively low number of TB cases in high risk groups such as the homeless and prison populations. There is a small but significant number of patients who are living with both HIV/AIDS and TB.
Inequalities across the City
The prevalence of TB in Manchester highlights significant variations in incidence across different wards in the City. The highest number of cases of TB is found in Cheetham Hill (30), Longsight (27), Moss Side (20) and Gorton South (15).

<table>
<thead>
<tr>
<th>Area (by Clinical Commissioning Group)</th>
<th>Number of cases of TB</th>
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</thead>
<tbody>
<tr>
<td>North CCG</td>
<td>53</td>
</tr>
<tr>
<td>Central CCG</td>
<td>124</td>
</tr>
<tr>
<td>South CCG</td>
<td>18</td>
</tr>
</tbody>
</table>

Source: Greater Manchester Health Protection Unit, Enhanced Tuberculosis Surveillance Data, 2011

Manchester’s approach to the planning and provision of TB services requires a detailed understanding of local migration patterns and needs. This is important in addressing existing health inequalities and the equity of provision locally, especially with migrant groups in all parts of the City who may not often be visible or heard.

Migration patterns locally are dynamic, but well understood (Manchester Annual Population Survey, 2013). Other health protection initiatives locally have been successful because they have implemented programmes of work that took into account the transiency of the local population. This demographic variation, and its speed, has a significant impact on local needs, and TB services need to be able to respond quickly and appropriately to such population change.

Further information regarding the population of the City, and its individual wards, is available in The Manchester Partnership’s State of the City Report.

Key determinants / risk factors
There are a number of social risk factors for TB, including having regular close contact with an individual who has TB and migrating from an area of the world with high TB incidence. Other groups with disproportionately high rates of TB transmission include the homeless, injecting drug users and those with HIV infection. Additionally, people who either work or reside in hospitals, homeless shelters and prisons are at greater risk of TB. Members of the population with diabetes mellitus, severe kidney disease, low body weight and immunosuppressive illnesses are also at heightened risk.

Some migrants may have more complex needs than the UK born population, influenced by the burden of disease and living conditions in their country of origin, experiences during migration, their new circumstances in the UK and factors relating to ethnicity and cultural practice.

There is also a strong stigma attached to TB in many BME groups that plays a significant part in contributing to both late diagnosis and a failure to undertake the full course of medical treatment required to cure TB. A failure to complete treatment can lead to further spread of the disease, and multi-drug resistant tuberculosis (MDR-TB).

Overcrowding, poor ventilation and substandard quality housing are also proven risk factors for the transmission of TB. More information regarding TB is available via NHS Choices.

Section 3: Current services

Specialist TB treatment services
The local specialist TB treatment service is based at the Manchester Royal Infirmary in the Respiratory Medicine department, with North Manchester General Hospital (NMGH) and Manchester’s Joint Strategic Needs Assessment.
Wythenshawe Hospital also providing TB services. Specialist services in Manchester diagnose and treat TB, support patients through their often lengthy treatment and also identify and screen those at-risk of TB, particularly close contact of cases.

**Bacillus Calmette-Guerin (BCG) Vaccination**

In Manchester, BCG vaccination is delivered in the community via the Health Visiting service to all newborns and children up to the age of 5 to protect them against TB. Although BCG vaccination is an important and useful tool, particularly in protecting children from more severe forms of TB such as TB meningitis, it would not be expected to reverse the increase in TB in Manchester, much of which occurs in adults infected overseas.

BCG vaccination coverage in Manchester was slightly above 80% in 2012; the appointment of a specific BCG coordinator, coupled with changes to the appointment system, should see an improvement in 2013. At present there is no comparative data with which Manchester can compare its BCG coverage due to unreliable national data sets and different vaccination policies (other areas offer a mixture of universal and targeted BCG immunisation programmes).

**Port of Entry Screening Programme for Active TB**

A screening programme aimed at detecting cases of active pulmonary TB in migrants exists at ports of entry across the UK. Case detection in the pre-entry and port of entry screening programmes are based on Chest X-Rays and symptom-screening. Neither programme is designed to detect latent TB infection. This programme only identifies a small percentage of the overall TB disease burden locally, and experiences considerable practical issues in regards to follow up and engagement with services.

A port of entry screening service for TB does exist at Manchester Airport, although this does not provide screening on-site. There is no robust evidence for the effectiveness and cost-effectiveness of port of entry screening schemes (Hogan et al, 2005). This service is being replaced by a pre-entry screening programme that will be carried out in countries of origin, rather than ports of entry in the UK.

**Strategic approach to developing services**

Public Health Manchester is committed to the principle of Proportional Universalism with regards to the delivery of local TB services; taking universal action to reduce TB in the whole population, but with a scale and intensity that is proportionate to the level of disadvantage. This is an important component of addressing existing health inequalities and the fairer distribution of good health and wellbeing. Extending good quality care to all residents of the City is not just about treating TB but also about social justice, inclusion, the economic wellbeing of our local economy and continuing to address the needs of some of the most vulnerable members of our communities.

**Views and experiences of service users**

We do not currently know enough about the experiences of service users or members of the public in Manchester regarding TB services, although the interests of groups disproportionately affected by TB are well represented locally by the third sector and patient advocates who have formed an integral part of the JSNA process.

Manchester is committed to ensuring that professional opinion, patients and TB advocates all play a key role, alongside the existing evidence base, in the shaping and design of local services.

The nature of TB, and the stigma attached to it, often results in many of those diagnosed being socially excluded. As the needs of many socially excluded people are often poorly reported in
national data sets, or not picked up by traditional data sources and surveys, it is important that Manchester goes beyond routinely available local data and works creatively with local organisations to better understand the true level of need in the City. Not only does this improve commissioning locally, but it builds greater momentum for change among participants and encourages a community development approach that takes into account the weight of the social determinants of health that contribute to the late diagnosis and treatment of TB in Manchester.

Effective local delivery requires effective participatory decision making at a local level, and this can only happen through the successful engagement of individuals and local communities.

Nationally, there is a relatively large amount of qualitative evidence that shows the majority of patients strongly support TB screening and treatment. The limited number of studies focusing on the acceptability of specialist TB services shows that a primary care / community-based setting is the preferred delivery mechanism. Evidence suggests that robust explanation of TB screening and consenting may be associated with higher acceptance rates (Brewin, 2006).

There is still a lot of work to do in regards to engaging communities who are hesitant to use services for a variety of reasons, and working with the community and voluntary sector will form the backbone of a local engagement strategy. It is important that peer support for individuals being treated for TB is considered.

Section 4: Gaps in Service

TB treatment is lengthy and usually involves a long course of antibiotics. Starting treatment as soon as possible and completing the whole course is key for preventing the transmission of TB and for achieving a cure. Preventing drug-resistant TB is vital as it has more severe consequences and is much more expensive to treat. It is therefore imperative that treatment completion rates are as high as possible.

An important factor in being able to achieve this is having accessible, high quality, adequately-resourced TB services including, crucially, adequate TB nursing levels, with full administrative support, in line with NICE recommendations.

Staff capacity is currently insufficient for meeting local need; a review in a recently published journal highlighted that in regards to TB nurses ‘Manchester was the most poorly resourced and showed the highest rate of increase in TB’ (Bothamley et al, 2011). There is currently an acknowledged shortfall of approximately six specialist nurses, a level of under-staffing that is primarily a result of the increase in TB cases locally over the last 10 years.

The complexity of many TB cases in Manchester also places additional demands on existing services and enhanced care is required for a large percentage of patients where a risk assessment shows that they have complex medical and/or social needs that may affect treatment compliance.
Proportion of TB cases in Manchester that require enhanced case management

<table>
<thead>
<tr>
<th>Trust / hospital (sector)</th>
<th>Data collection period</th>
<th>Standard care cases</th>
<th>Enhanced care cases*</th>
<th>Total cases**</th>
<th>Percentage of cases needing enhanced care</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMFT (Central)</td>
<td>Jan to Dec 2010</td>
<td>60</td>
<td>96</td>
<td>170</td>
<td>56%</td>
</tr>
<tr>
<td>CMFT (Central)</td>
<td>Jan to Dec 2011</td>
<td>89</td>
<td>91</td>
<td>180</td>
<td>51%</td>
</tr>
<tr>
<td>Wythenshawe (South)</td>
<td>2010 to 2012</td>
<td>21</td>
<td>24</td>
<td>45</td>
<td>53%</td>
</tr>
<tr>
<td>North Manchester General (North)</td>
<td>Jan to Dec 2011</td>
<td>46</td>
<td>42</td>
<td>88</td>
<td>48%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>-</td>
<td>216</td>
<td>253</td>
<td>483</td>
<td>52%</td>
</tr>
</tbody>
</table>

Source: Data provided by TB services in Manchester (collated by Public Health Manchester)

* Enhanced care is required for patients where a risk assessment shows they have complex medical and/or social needs, as recommended by NICE guidance.

** May include cases excluded due to incomplete data.

A strategy to prevent and control TB in Manchester, agreed in 2011, highlighted the need for further action on new entrant screening for latent TB. Since most TB in the UK is a result of reactivation, a targeted approach to identify and treat patients who are likely to develop TB in the future is necessary.

A strategic approach to developing an LTBI screening programme is under way. A collaborative approach between Central Manchester Clinical Commissioning Group, Manchester Royal Infirmary, Third Sector Organisations and Manchester City Council will ensure that implementation of the clinical aspect of the service is closely aligned with a community engagement strategy that focuses on taking action locally to address some of the social and cultural barriers that impede access to TB diagnosis and treatment.

More training is also required for primary care staff who may encounter patients with TB. It is important that healthcare professionals do not perpetuate any stigma attached to TB, particularly with groups that may lack trust in healthcare systems or be unfamiliar with the role of the health service in the UK. The development of a strategy for LTBI screening must ensure that the training and development of the workforce is a key component.

**Inequities in services across the City**

Historical variations in the availability of BCG Vaccination across the City are being addressed through the centralisation of the appointing system for all children in Manchester. This prevents variations in the provision of clinics by ward, and standardising the appointment process centrally has a proven track record of improving vaccination uptake. Manchester remains committed to reducing health inequalities and inequities through such ‘equity proofing’ measures to ensure that populations do not receive variable standards of care, or variable levels of access to care, dependent on where they live.
Section 5: What more do we need to know?

More detailed prevalence information regarding individual cases would better inform commissioning arrangements for TB services. More data that details the length of time each individual with TB has been in the UK prior to diagnosis, last visits to country of origin and residential status in the UK would paint a more detailed picture of disease transmission locally. In a time of limited resources, it is vital that designated monies for TB are spent both effectively and cost-effectively.

Commissioning arrangements regarding community engagement should also take into account local strategies to address other infectious diseases that disproportionally affect BME groups and explore ways of merging health improvement initiatives to reduce duplicated effort and costs.

The implementation of a new latent TB screening programme will place new demands on already stretched clinical services. It will require additional resources for identifying eligible screening recipients, the screening itself, the follow up of LTBI and active TB cases in secondary care, and monitoring and evaluation. More work is required locally that projects the expected demand on local services, and considers the effectiveness and cost-effectiveness of projects that are implemented.

There is a relatively recent body of evidence regarding the implementation of LTBI screening programmes that evaluates both their effectiveness and cost-effectiveness in the UK, but the development of a consistent national, evidence-based approach to tackling Latent TB is urgently needed.

A systematic review of current new entrant screening programmes highlights large variations in the quality of the TB screening activities of local primary care providers (Pareek et al, 2013), with areas most affected by TB also often the least likely to undertake an LTBI screening programme. Manchester is committed to learning from the experience of authorities with similar demographics about how best it practically implements its screening programme.

Whilst TB is a well-understood disease, there is a lack of evidence and evaluation available regarding latent TB screening programmes. There is emerging evidence regarding successful latent TB screening pilots that have shown to be both effective and cost-effective; encouragingly, this evidence is emerging from local authorities with similar demographic and socioeconomic profiles to Manchester, such as Hackney and Leeds.

Section 6: What do we need to do next?

More can, and should, be done to prevent and control TB in Manchester. Our local goal is to halt, and begin to reverse, the increasing incidence of TB. The following recommendations are not aimed specifically at one particular organisation as they all require a partnership approach to function, between the local authority, the NHS and the third sector to be successful.

- to develop and implement a latent TB screening programme for new entrants to the UK, closely linking it to a community engagement strategy that addresses social and cultural barriers to accessing TB services
- to provide clarity on finance, governance and leadership arrangements for the provision of TB services locally
- to build capacity in existing clinical services to meet local need for Specialist TB diagnosis and treatment
• to ensure that the principle of equity is embedded in the design of TB services locally, with specific actions tailored towards groups that are disadvantaged, marginalised and have the most to gain from targeted intervention
• to ensure that all organisations concerned with the diagnosis, treatment and reduction of TB in Manchester work effectively together through close collaboration and careful planning
• to build on the positive changes made to the BCG vaccination programme, with a view to achieving the target of 95% uptake by the age of three months.