JSNA
Joint Strategic Needs Assessment

Tuberculosis (TB): an epidemiological analysis and review of service provision in Hammersmith and Fulham, Kensington and Chelsea, and Westminster

Tri-Borough Joint Strategic Needs Assessment (JSNA) Report 2014

March 2014

Website: www.jsna.info

This Report

This TB needs assessment supports the development of a tri-borough strategy and Clinical Commissioning Group (CCG) commissioning intentions.

It specifically aims to describe:

- the prevalence, trends and characteristics of TB in the tri-borough,
- the current service provision with regards to prevention, screening and management of TB, and
- whether existing services are meeting the needs of residents in the tri-borough and identify gaps in services and areas of unmet need

Data was collected from a number of sources including the London TB Register, the 2011 census from the Office for National Statistics, and local data provided by stakeholders and providers. Interviews were conducted with key stakeholders and providers.

Report authors and contributors

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Acknowledgements

We would like to thank Dr Sarah Anderson, Dr Yimmy Chow and Dr Delphine Grynszpan from Public Health England for insights and helpful comments on the drafts, Wazi Khan and Gail Morgan for data provision and analysis and Sheena Basnayake, Marie O'Donoghue, Tracy Palmer, Lynn Altass, Julia Mason, Gillian McKormack, David Eastwood, Dr Alistair Story, Dr Onn Min Kon, Dr Anton Pozniak and Angela Spence for their time and effort in contributing to this document.

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Executive summary

Tuberculosis (TB) is an airborne disease that is treatable, but if left untreated leads to important health deficits and may be fatal. It can be latent in people exposed to TB and emerge as an active disease later in life. The prevalence of TB across the Tri-borough area is twice as high as the national average and, although stable at present, the tri-borough faces unique challenges in preventing TB. TB is a notifiable infectious disease with new cases being reported to Public Health England (PHE). Previously this was the remit of the Health Protection Agency (HPA) which is now part of PHE.

This JSNA reports on the prevalence and characteristics of TB across the tri-borough, describes current service provision and makes recommendations to ensure services meet the needs of the local population.

Main findings

Overall TB strategy and management

The main concern with regards to TB strategy and management is the lack of clarity surrounding the strategic planning of services. The TB Action group which used to bring together commissioners and service providers is no longer in existence and there is no obvious successor. The commissioning of TB services across Tri-borough now falls to the Clinical Commissioning Groups (CCGs) with input from the Health and Wellbeing Boards. This new arrangement provides opportunities for Adult Social Care, CCGs and Public Health to join up thinking and provide a TB service which addresses current issues around provision of housing for TB patients without recourse to public funds and operate across boundaries. However, currently there is no clear arrangement with regards to the TB strategy. A London TB Control Board (LTBCB) has been set up by Public Health England London and NHS England (London Region) in order to provide strategic oversight and direction and a whole systems approach. Initially the LTBCB will meet quarterly.

Services for management of active TB

Currently there are four centres at which TB services are provided with a large input of specialists for a small service, which are shaped the way they are largely due to historic reasons. Having four smaller services is problematic in terms of funding and providing appropriate staffing levels. Whilst staffing is largely adequate, the trusts struggle to recruit qualified staff in times of maternity or sick leave for example. Economies of scale are needed for the provision of specialist clinics and adequate staffing levels to respond flexibly to increased demands, e.g. while managing a potential TB outbreak or providing for more complex TB cases in the community. Specialist services have to be provided with a minimum frequency but are not working to full capacity and there is a duplication of services. The nursing service at Imperial is provided by two different providers – Imperial nursing service and the CLCH community nursing service. This arrangement, originally designed to ensure

more community input, does not work as well as hoped and creates unnecessary tensions and gaps in service provision. In terms of collaboration between the services the teams at St Mary's Hospital and Chelsea and Westminster have close working relationships. These are less well developed between the Hammersmith and Fulham (H&F) service with the other sites, likely as a result of the split nursing services and split clinic sites.

Whilst remuneration for the service is based on borough residents the services see large numbers of patients across boroughs. Whilst this is not an issue for the teams at St Marys Hospital (SMH) and Chelsea and Westminster Hospital (ChelWest), it does put pressure on the Hammersmith & Fulham TB nursing team who are unable to cross charge for people out of borough. Overall the TB services work well but there are more tensions at Hammersmith & Fulham due to the fact that the service is spread across two hospital sites and jointly provided by the acute trust alongside community nurses.

TB services at the hospitals are currently funded through the community respiratory contract as well as the acute contract but services fall short of service provision in the community. In addition, potential outbreaks are not limited to borough boundaries and frequently there is no coordination of resources across borough boundaries to respond efficiently.

The mobile x-ray unit and Find and Treat team fulfil a unique role in working with the acute trusts and third sector as well as the local authorities to find patients lost to follow up and screen hard to reach populations. They are a highly efficient and important service particularly in Inner North West London where vulnerable groups are particularly prevalent. Previously screening prisoners was part of their remit but has now been taken out, as prisons have their own X-ray equipment. However, this equipment is currently not operational, leaving a vulnerable group with high TB prevalence unscreened at present.

The management of latent TB is crucial in preventing active TB, however at present identification and referral of people at risk of latent TB is patchy. GPs have been identified as the most effective means of identifying and treating latent TB, however no pathways and no clear funding is currently identified and latent TB screening happens ad-hoc. Adequately diagnosing, treating and/or monitoring latent TB is arguably the most important step in controlling TB in London going forward. Peer education through third sector groups, for example for the Somali or Ethiopian community, is not joint up with services at present and the third sector is underused in the diagnosis and management of TB.

Vaccinations are offered at time of birth universally across Tri-borough and uptake is good. However, vaccinations for high risk children are less well coordinated and could be improved.

Recommendations

Recommendation 1: Pooling staff, clinics and resources where appropriate

Combine specialist services

In order to tackle some of the issues described earlier and make efficient use of resources, providers need to identify opportunities to pool staff, clinics and resources across provider sites to provide economies of scale. Local services need to be maintained but specialist input for example in paediatric HIV, multidrug resistant TB (MDR TB) for example may best be provided at one site running larger clinics rather than smaller ones at several sites. At present there are trusts close together providing similar expertise for a relatively small workload which is unlikely to be cost efficient.

Reduce clinic sites

The flux in workload associated with the management of an incident or outbreak argues for a larger single team or a formal co-operation between all the teams and pooling of resources or access to a dedicated resource in order to provide this service. A single service model has been shown to work in North Central London. A coordinated service for the Tri-borough would allow clear clinical leadership, standardize practice, ensure equal access to all patients referred to the acute teams, and allow for fluctuations in workload given the intensity of incident management. This will also improve TB Clinical Nurse Specialist (CNS) career progression and training.

It would be useful to map capacity across the four sites in terms of accessibility and decrease the service to two hubs with additional provision of community services.

Recommendation 2: Considering how hospital and community services can be provided more effectively and efficiently

Strengthen the community aspect of TB management

One solution to improve effectiveness of the TB service could be to separate out community and hospital nursing. For the maintenance of patient continuity the acute trust needs to remain carrying out work on index case and latent TB infection (LTBI) case management including home visits in the community. However, the community service is well placed to carry out new entrant screening and active case finding (but not contact tracing connected to an index case managed by the acute trust) and provide support for hospital as well as primary care services. NICE guidance suggests that the TB service is best provided by specialists. Hence the community service could either be provided by CLCH who have access to several community clinics as well as GP clinics or by specialist TB services developed through primary care. By removing the new entry screening element from the hospital teams this would free up time for case management for the hospital teams. The community New Entrant

B7 resource at SMH (which is currently vacant) should be reviewed and utilized. Community nurses are also well placed to respond to outbreaks and large screening exercises in coordination with hospital services.

Recommendation 4: Establishing a local pathway and programme for the management of latent and active TB

Establish a latent TB screening programme

At present timely and thorough Latent TB screening is the biggest factor in preventing further TB. Paradoxically the community aspect of TB is the part of the service that's the least well covered both by the TB services as well as primary care. According to the most recent London TB report [1] even optimal prevention of TB transmission in the UK would only prevent a minority of reactivated TB cases in those born outside the UK. To prevent TB transmission, efforts should be concentrated on new migrants to the UK in the last 5 years. Primary care and community services play a crucial role in this regard.

Establish a clear pathway for the management of acute and latent TB in the community involving all stakeholders

There needs to be a clear TB pathway and dedicated funding for GP practices to identify latent and active TB cases and improve interaction and communication with GPs and hospital services with clear responsibilities and referral criteria.

A joint pathway with local authorities for the management of patients with no recourse to public funds would go a long way in preventing an increase in TB cases particularly with regards to drug resistant TB. Identifying funds for a dedicated social worker for TB would contribute to making the service more effective and efficient by establishing good links between the housing department in the council, third sector contacts and the TB teams.

Third sector services, for example voluntary organizations working within high risk immigrant communities, should be utilized by TB services in a coordinated way and included in funding streams. A latent TB screening programme could benefit from joint work with the third sector (e.g. Ethiopian Women's Group, Midaye Somali Development Network).

Recommendation 3: Reviewing current commissioning arrangements and establishing specific service specification and service level agreements for TB

Unbundle the components of TB service costs and establish clear service specifications and service level agreements

Financing of the services plays a major part in its delivery. The CCGs are crucial in funding both community and hospital TB services adequately going forward.

Currently TB payments are bundled into the acute respiratory block contract or respiratory services for TB nursing by CLCH. The Payments By Result (PBR) method does not allow for flexible allocation of the funds across all the various elements of TB care such as screening activities, data entry, cohort review, contact tracing and incident management. Essential TB work is not just the treatment of a patient with TB but largely preventing cases of TB, hence screening activities need to be funded as part of the overall package of TB care. Unbundling the TB costs and assigning average costs for the different elements of the service may help in providing for all aspects of TB care. Bundling TB into the bigger services risks essential funds being diverted from TB. Additionally, no service specifications exist, making assignment of responsibilities difficult.

Since TB services are part of the acute block contract it is important to know how TB cases are coded for tariff payment – infectious disease cases attract nearly twice the tariff of a respiratory medicine tariff. This would also provide a solution for The TB service at Imperial would benefit from It would also allow for cost efficiencies.

Unify services under one provider

Clear service level agreements specifically for the TB service are needed. The Imperial College Health NHS Trust (ICHNT) allied clinic TB nursing service comprising nurses from ICHNT and Central London Community Healthcare NHS Trust. Whilst the CLCH nurses currently work well with Imperial Colleagues there are a long standing history of issues and concerns, mainly derived from having to work across two organizations with different funding arrangements in place. There are tensions within the H&F service with regards to funding that do not arise in the other centres at which staff, consumables and other resources are paid out of one budget.

Unifying the service for all of the Imperial services under one contract would go one step further in improving the service in terms of management structure, ability to cross cover, optimize clinic access, utilize directly observed therapy (DOT) more effectively and allow uniform practice and clinical accountability. Currently commissioning TB nursing separately across the Imperial sites is neither clinically desirable nor cost effective. In addition, CLCH nurses do not benefit from training in HIV or paediatrics and have limited career progression by not being part of the hospital team under one employer.

Consider joint TB funding across regions

The knock for knock arrangement between boroughs for larger services does not work well with smaller specialized services such as TB. Therefore not operating a strict borough boundary but instead joint funding via the various commissioners might work better. This is a more pressing problem for H&F where two different contractual arrangements are in place for CLCH. A separate pooled resource for providing additional resource at short notice such as external security for sectioned TB admissions at hospital or to fund additional workload around potential outbreaks

would be desirable. Alternatively, resources for outbreak management could be clearly earmarked but this may be resolved by unifying some of the services.

Resources for pharmacy DOT need to be identified in order to meet the need for patients requiring access out of hours and weekends. Providers need to establish between them what pooled resources are required and available to meet demand for the service. This would need to include all provision for incident management and active screening. Employment of non-clinical staff to deliver some of the outreach work including contract tracing may achieve some cost savings.

The work of the mobile X-ray unit and the Find and Treat team who fulfill a unique and crucial role in TB prevention and treatment London wide has to be adequately funded and future proofed. The prisons are currently not screened at all despite high rates of TB among the prison population. This needs to be addressed urgently.

1. Key facts about TB: why is it an important issue?

Tuberculosis (TB) is an airborne disease caused by a bacterium which usually affects the lungs but can develop in any part of the body. Pulmonary TB (affecting the lungs) can spread the disease to others. TB is curable in almost every case if the full treatment is taken (usually 6 months involving up to 4 drugs), otherwise the disease can return in a drug-resistant form (which can take up to 2 years to treat and is associated with a higher mortality). Therefore directly observed therapy (DOT) should be considered for every person with adverse risk factors for adherence [2,3].

The sequelae of untreated TB include pneumonia, spinal/ bone lesions, meningitis and kidney injury and leads to premature morbidity and mortality. TB is still fatal in about 3% of cases. After the initial inhalation of infectious TB, some individuals infected with TB do not immediately progress to active TB but have latent TB. These people do not have active TB disease and are not infectious. However, 10 per cent of these patients (5% in the first two years after infection and 0.1% per year thereafter, but at a higher risk if they are immune suppressed) will go on to develop active TB at a later stage of their life and may be infectious.

The identification and treatment of people with latent TB is therefore an important part of TB control as preventative treatment may stop progression to active disease. TB is notifiable and an important part of prevention is contact tracing (identifying exposed individuals who may have latent infection or active disease) to prevent further transmission or outbreaks. Children, the elderly and immune suppressed people are the most vulnerable to developing active TB. A comprehensive vaccination programme is crucial in protecting children from the most severe forms of TB disease.

Even though TB is relatively uncommon the consequences of poorly controlled and/or untreated TB is of major significance to public health and the NHS for the following reasons: Whilst drug-sensitive TB is relatively cheap to treat (between £1000 and £5000 per case), drug-resistant TB (or at its worst extensively-drug resistant TB) can cost at least 10 times as much. Globally around 4% of all newly diagnosed TB cases are now drug resistant. However, in those who have been non-adherent to their TB treatment multi-drug resistant TB develops in about 20%. A recent report by the all-party parliamentary group about drug resistant TB highlighted the fact that whilst only 2% of South African TB cases were drug resistant, over a third of the entire TB budget was spent on drug resistant TB[4].

The risk of TB and particularly drug resistant TB is increased in individuals who have one or more social risk factors such as homelessness, drug use, alcohol misuse, imprisonment associated with a high risk of non-adherence. Often a number of risk factors co-exist.

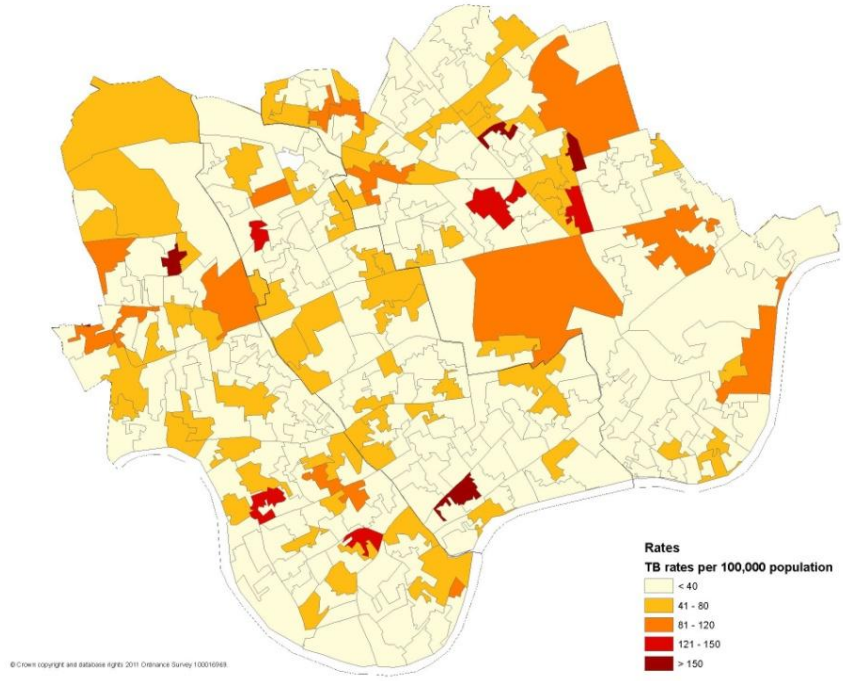
TB presents a particular challenge for the tri-borough area because of its central London location with high levels of homelessness, high density of schools, colleges, universities, work places and neighbouring boroughs with very high TB prevalence, making TB prevention particularly resource intensive for the tri borough due to large scale and complex contact tracing exercises.

2. Epidemiology

2.1 Prevalence

The prevalence of TB in London (41 per100,000 in 2012) is significantly higher than the national prevalence (13.9 per 100,000 in 2012). Compared to outer North West London (NWL) boroughs the Tri-borough has low TB rates, with Hammersmith and Fulham at 26, Royal Borough of Kensington and Chelsea at 21, and Westminster at 23 per 100,000. By contrast, Brent has the highest rate of TB cases in NWL at 100 per 100,000, followed by Harrow at 76, Hounslow at 75, Ealing at 74 and Hillingdon at 49. The incidence rate Borough level masks marked variation at local level as seen in the map below which shows TB rates at a middle layer super output area level for the tri-borough (figure 1). 48.5% of all TB notifications were reported pulmonary TB which is very similar to the overall pulmonary percentage from London (48%).

Figure 1: TB rates in the tri-borough



2.2 Place of birth

The majority of TB cases (89%) in North West London are born outside the UK. A similar trend is also seen in tri-borough. Nationally in 2010, only 23% of cases were diagnosed within two years of entering the UK.

2.3 Ethnicity

In the tri-borough most cases are Black African (37%) or white (20%). This contrasts with the rest of North West London where most TB cases are of Indian ethnicity (46%) followed by individuals from Black African ethnicity (19%).

2.4 Social risk factors

Homelessness, drug use, alcohol misuse, mental illness and prison are all associated with a higher risk of TB. In addition, treatment completion rates in people with any of these risk factors are often poorer. A total of 9% of notified TB cases had one or more risk factors in 2012. Nationally, among cases with known information, 2.7% had a history of problem drug use, 4.3% of alcohol misuse/abuse, 2.7% of homelessness and 2.5% had a history of imprisonment. Across tri-borough these figures are considerably higher (table 1).

Table 1: Social risk factors among TB cases by Borough of residence

☼ *: Some of these cases had multiple risk factors and should be treated with caution*

2012	Total population	All TB cases	Drug use		Homeless		Prison		Alcohol		Mental		% non-British born	
H&F	184,000	68	1	1%	3	4%	3	4%	4	6%	4	6%	41%
RBKC	158,700	48	2	4%	3	6%	2	4%	0	0%	8	17%	46.3%
Westminster	219,400	65	5	8%	5	8%	3	5%	2	3%	6	9%	52.2%

**sources: LTBR, ONS*

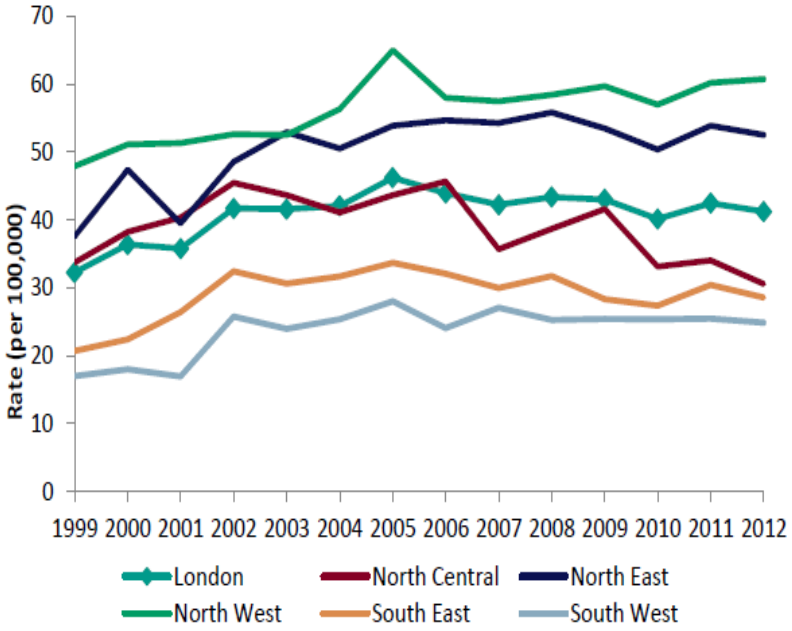
When homelessness is defined as either current, recent, or any time in the past (majority are likely to be currently or recently homeless) then the figures for homeless people affected by TB in 2012 is as follows (table 1): Overall 11% of people with TB were homeless (15/132) in 2012, up from 6% (11/180) and 7% (11/152) in the years previously in the tri-borough. Hammersmith and Fulham reported 46 individuals with TB in 2012, of which 4 (9%) were homeless. Corresponding figures for 2011 and 2010 were 3(4% of 68) and 1(2% of 54). In RBKC 2 individuals were homeless with TB (6% of 33 TB notifications) in 2012 (2011: 3(6% of 47), 2010: 4(11% of 36)). In Westminster 9 people were homeless with TB in 2012 (17% of 53), compared with 8% (5/65) in 2011 and 10% (6/62) in 2010.

In summary the proportion of homeless individuals with TB is increasing in the tri-borough, particularly driven by Westminster and Hammersmith and Fulham (H&F) whereas the Royal Borough of Kensington and Chelsea (RBKC) has remained steady after an initial decrease. The numbers are likely to be a minimum estimate as this information is unreliably recorded on the London TB Register according to them.

2.5 Time trends

TB rates in London have risen by 50% between 1999 and 2009. Within London, the North West London (NWL) sector has the highest number of TB cases compared with the other sectors (figure 2). In the last six years TB notifications per year in NWL have remained over 1000 with the highest numbers reported in 2011. Whilst trends have either increased or remained static in the London sectors, the only sector which has shown a marked reduction of TB notifications is North Central, where the TB service and contractual arrangements were changed in 2007, highlighting that TB control may be supported by coordinated service provision and additional multi disciplinary staff that meets TB patient needs.

Figure 2: Tuberculosis case rates by London Health Protection Team, 1999 – 2012



London TB rate per 100,000 population by sector of residence reported to the London TB Register (based on Tuberculosis in London: annual review 2012 data)

In a nutshell

TB presents a significant challenge for the tri-borough primary and secondary care services. High risk groups are particularly prevalent in the inner London boroughs. There is high population churn and a high immigration rate from TB high risk countries. The prevalence of multi-drug resistant (MDR) TB is currently one of the lowest in the capitals of Western Europe despite the fact that TB rates are highest; however any increase in MDR TB is associated with a potential spiralling of costs. The number of TB cases is staying the same or increasing, indicating that TB control across the tri borough is not adequately managed at present. The tri-borough teams also have a high density of large scale contact screening incidents given the number of schools and colleges in the area. The recent NHS re-organisation presents an opportunity to improve TB services but also a danger of disintegrating services.

3. TB service provision

3.1 NICE guidance on TB services

Elements of a comprehensive TB service

a) Planning and monitoring
b) Management of active TB
c) Improving adherence
d) New entrant screening
e) BCG vaccination
f) Active case finding
g) Contact tracing and outbreak prevention

The NICE guidance on TB published in 2006[5] and 2011[2] identifies key priorities for implementation. The London Tuberculosis Register which is hosted by Public Health England and completed by TB services in London contains data against which to measure service performance. These came from the London TB Metrics developed by London's TB services.

a) **Management of active TB** – including adequate treatment regimen, completion and contact screening. Performance measures: (1) A minimum of 1 specialist TB nurse for every 40 TB notifications (annual TB notifications) or 20:1 for cases requiring enhanced case management and admin support of 1 WTE admin worker per TB clinic at AfC Band 3 or above, measured quarterly and annually is required to provide an adequate service. (2) Treatment completion rates: Treatment outcome reported for all TB patients, on a quarterly basis for the 12 month preceding period, to achieve, as a minimum, 85% treatment completion rate (national target) using WHO equation % = (C/T) x 100 where C is treatment completions using the 'treatment status at 1 year' field on LTBR (numerator) and T is all TB notifications (denominator) including deaths but now in keeping with international standardization excluding MDR TB cases and denotifications. Prevention of further infection (contacts) (3)

b) **Improving adherence –** recommends that all patients should have a risk assessment for adherence to treatment, and Directly Observed Therapy (DOT) should be considered for patients who have adverse factors on their

risk assessment, in particular: street- or shelter-dwelling homeless people with active TB, patients with likely poor adherence, in particular those who have a history of non-adherence at risk assessment. Performance measures include (4) Risk assessment and identification of complex needs: Percentage of notified TB patients assessed on a quarterly and annual basis for: drug use, homelessness, past or current prison, alcohol, mental health issues (5) Directly Observed Therapy (DOT): The preferred care support system for patients assessed as requiring DOT is delivery according to the London TB DOT standard where 100% TB patients requiring DOT receive DOT. Lost to follow-up: All lost to follow-ups (LTFU) are identified and referred to the designated support service according to the London protocol for LTFU patients. Performance measure: (6) Services to report number of LTFU cases as a percentage of total TB notifications at 12 months (7) HIV testing - all TB patients to be offered HIV test on an opt-out basis.

c) **New entrant screening**- recommends that new entrants be identified from Port of Arrival reports; new registrations with primary care; entry to education (including universities); links with statutory and voluntary groups working with new entrants (no performance measures). This is now superseded by point of exit screening and new entrant screening in primary care or the community setting, although arrangements for this are not yet in place.

d) **BCG vaccination**- recommends that primary care organisations with a high incidence of TB (London is > 40 per 100,000) should consider vaccinating all neonates soon after birth.

e) **Active case finding** – recommends that active case finding should be carried out among street homeless people (including those using direct access hostels for the homeless by chest X-ray screening on an opportunistic and/or symptomatic basis). This is done mainly by the mobile X-ray unit.

3.2 Current service provision in the Tri-borough

The following section gives an overview of services provided for TB in Tri-borough against the elements of a good TB service as recommended by NICE, starting with the planning of services, timely diagnosis of active and latent disease, appropriate treatment, case finding, incident management and vaccination.

Table 2 shows activity data for the different sites. The characteristics of local services, further activity data, and clinic activity are described in Appendices 1-4.

Table 2: Number and type of notified TB cases by service

	Episodes (total)	**Active cases (of which MDR)**	**Paediatrics (<16)**	**HIV**	**LTBI**	**Adult**	**Paediatrics**	**HIV**
St Mary's Hospital (SMH)								
2013 Q1&2	63 (1 denotified)	**62 (4 MDR)**	5	7	**29**	24	4	1
2012	116 (13 denotified)	**103 (6 MDR)**	13	8	**98**	79	17	2
2011	146 (17 denotified)	**129 (not recorded)**	10	7	**91**	53	35	3
Chelsea and Westminster (ChelWest)**								
2013 Q1&2	34 (1 denotified)	**30 (0 MDR)**	2	6	**37**	36	0	1
2012	50 (1 denotified)	**43 (0 MDR)**	3	9	**49**	47	1	1
2011	84 (5 denotified)	**75 (0 MDR)**	6	11	**51**	45	4	1
Hammersmith & Fulham								
2013 Q1&2	59 (5 denotified)	**54 (*)**	1	*	*	*	*	*
2012	142 (19 denotified)	**123 (*)**	1	*	*	*	*	*
2011	136 (14 denotified)	**122 (*)**	5	*	*	*	*	*

*data not available

** does not include the cases seen at the Royal Brompton and Marsden hospitals

3.3 Planning of TB services

Planning of TB services (including needs assessment, service strategy and monitoring) is a crucial part of delivering TB care and is now under the joint remit of Public Health London and NHS England (London region) but was previously done by the TB Action Group, Public Health and the HPA.

Elements of planning include needs assessment by examining prevalence, incidence, service provision and monitoring. It also includes service improvement, service strategy and actions based on the needs assessment and finally the commissioning of TB services.

Commissioning is the responsibility of the CCGs and NHS England. There is potential for fragmentation as various bodies have different responsibilities with regards to assessment, improvement and commissioning.

3.4 Diagnosis of active and latent TB (*GPs, community and acute services*)

GPs and TB services have a crucial role in delivering on this. New entrant identification, screening and advice for patients originating from countries with a

high TB prevalence is important. Previously, patients suspected of TB were referred into hospital services for tuberculin skin testing, IGRA tests and X-rays, whereas GP services may be able take a more active role in aspects of screening and advice by implementing new entrant screening either using an IGRA or tuberculin skin test. GPs are likely to be expected to take a more active role in diagnostic screening and advice with the out of hospital strategy.

Even though the service specification for CLCH TB nursing includes new entrant screening this has been handed over to the GP practices since the end of April 2011. GP practices have been shown to be more cost effective and efficient than Port of Arrival screenings in identifying potential latent TB cases.

However, GP screening has to date been inconsistent and no clear assessment and patient pathway exists for latent TB. H&F ran a pilot into GP screening and there are plans to roll this out in the future. Any latent TB cases suspected by GPs are currently referred into the hospital based TB service for diagnostics and treatment.
There is local variation in the early identification of TB cases with GPs in high prevalence areas being faster to recognize and refer TB than other areas.[1] GPs occasionally use choose and book instead of referring into services directly, thus delaying timely diagnostic work up. The identification of latent TB cases is mainly done through screening of patients originating from high prevalence countries. It has recently been agreed by the London Control Board that there is a threshold of 150 per 100,000 by the London Control board, helping provide clear criteria for screening for latent TB for primary care.[2]

There is very little TB support work carried out by the third sector. Some isolated TB projects were run in the past by the Ethopian Women's Group or Midaye Somali Development Network for example. Joined up work would benefit a latent TB screening programme in the future. There is huge untapped potential for encouraging immigrants from high risk countries to seek help with peer initiatives.

3.5 Treatment of TB following diagnosis

There are 3 hospital teams covering St Mary's Hospital (SMH), Charing Cross Hospital, Hammersmith Hospital, and Chelsea and Westminster Hospital. Imperial has three hospital sites – one larger service at SMH and two smaller services in H&F split over 2 hospital sites. TB nurse specialists, TB/ infectious disease or chest consultants, outreach workers and social workers are based in hospital. Social workers are often working in isolation at the hospital sites and there is high staff turnover. There are no social workers specifically dedicated to the TB services. The guidelines

[1] *personal communication Wazi Khan, PHE, March 2013*

[2] *personal communication Dr On Min Kon 20 October 2013*

recommend 1 TB nurse for every 40 TB patients and 1 TB nurse for every 20 complex cases requiring enhanced case management.

H&F is unique in that the TB service is provided via the CLCH community TB nurses based in the two hospitals working together with hospital consultants. Once patients are diagnosed with TB they need to receive the appropriate treatment e.g. with the right medication and making sure that the drug course is completed (6 months usually or may be up to 2 years with drug resistant TB).

The first line drug regimen consists of 4 antibiotics called Isoniazid, Rimpicin, Ethambutol and Pyrazinamide. In the initial phase daily Isoniazid, Rifampicin and Ethambutol is given for 8 weeks. This is then continued either with Isoniazid and Rifampicin for a further 18 weeks.

Adherence to the medication is crucial in preventing drug resistant TB. Directly observed therapy (DOT) is therefore often used in patients at risk of non-adherence. DOT for patients at high risk of non-adherence is an important part of managing acute TB. In the tri-borough DOT happens in around 10% while patients with risk factors are around 20% (this however has to be considered carefully as DOT is often depending on more than just having a risk factor and patients without risk factors may require DOT and vice versa as assessed by the clinicians). There are initiatives by the teams to enable DOT cost effectively such as using Skype or smart phone applications.

Outreach workers provide DOT in hours but there is no dedicated funding or process for out of hours DOT delivery. Every patient has a risk assessment for adherence and loss to follow up, there are clear situations when DOT should be considered, if the case manager does not recommend DOT or DOT is not possible for a patient with risk factors, then there is a formal discussion with the MDT to make the ultimate decision on DOT. At Chelsea and Westminster Hospital the TB nurse specialists deliver DOT in about 10% of patients in collaboration with GPs, hostels and pharmacies relying on the good will of the institutions involved, even though the number of patients with at least one risk factor for non adherence is higher than 10%. Provision of pharmacy DOT needs to be formalized and funded. Funding in the past has been on a case by case basis, which is neither sufficient nor efficient. The team at St Mary's Hospital is the only team with a TB dedicated outreach worker.

TB treatment therefore requires resource-intense case management, multi disciplinary TB clinics, provision of TB beds with negative pressure facilities as well as making sure that contacts are traced and screened to prevent the spread of TB. This treatment is the responsibility of the acute trusts and is currently split between CLCH nursing services and Imperial trust nurses in H&F. TB microbiology services and reference laboratories as well as inpatient infection control services need to be provided. In Westminster and the Royal Borough of Kensington and Chelsea (RBKC)

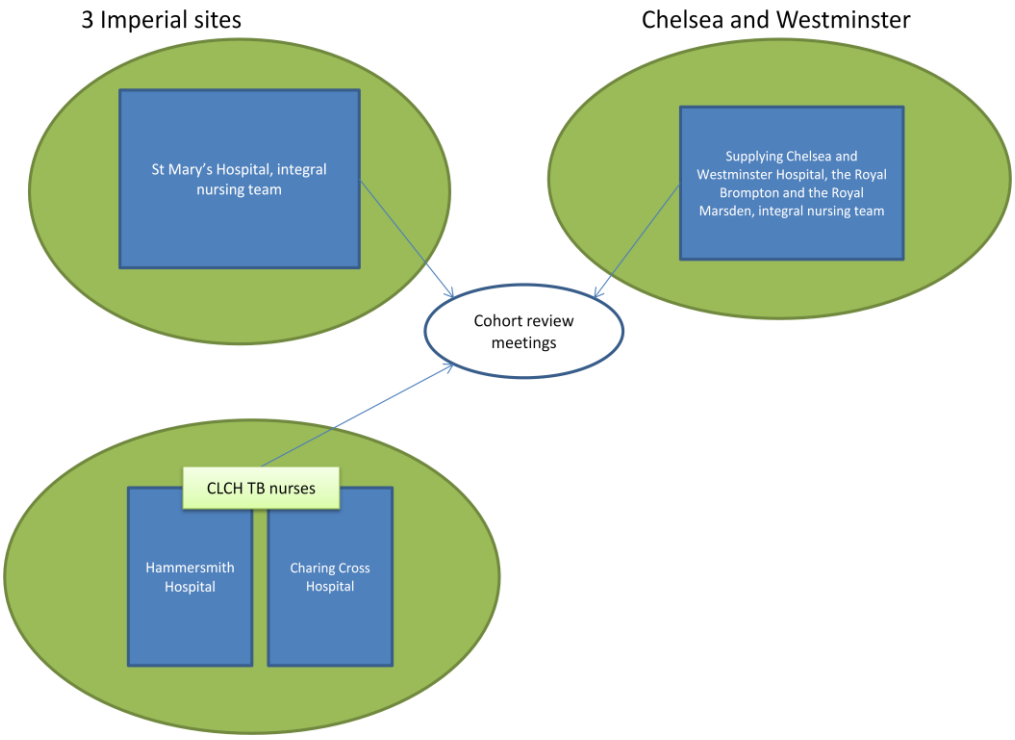
this element of the TB service is provided through the acute service, in H&F it is split between the acute trust (which pays for the medical staff) and CLCH which provides the nursing element of the TB services in the hospitals. The social element of housing for homeless patients on treatment is provided by the council and voluntary sector or public health in patients without recourse to public funds.

Provision of data for monitoring and quality control by the service providers to Public Health England (who take overall responsibility for TB monitoring) is also a requirement, while performance management falls to the commissioners. However, there are currently no formal arrangements or pathways for this.

Community work is covered more or less well by individual teams but lack priority in all settings, regardless of whether the service is commissioned through community nursing services or via the acute trust contract. Very few TB patients are managed as inpatients hence community work plays an important role in adequate TB management. The acute trusts are currently responsible for home visiting, managing access to social care and support in the community, and do outreach work in collaboration with community services such as pharmacies, community infection control, GP services, the councils and voluntary sector, although collaborative work with these organisations is rare and ad hoc at present.

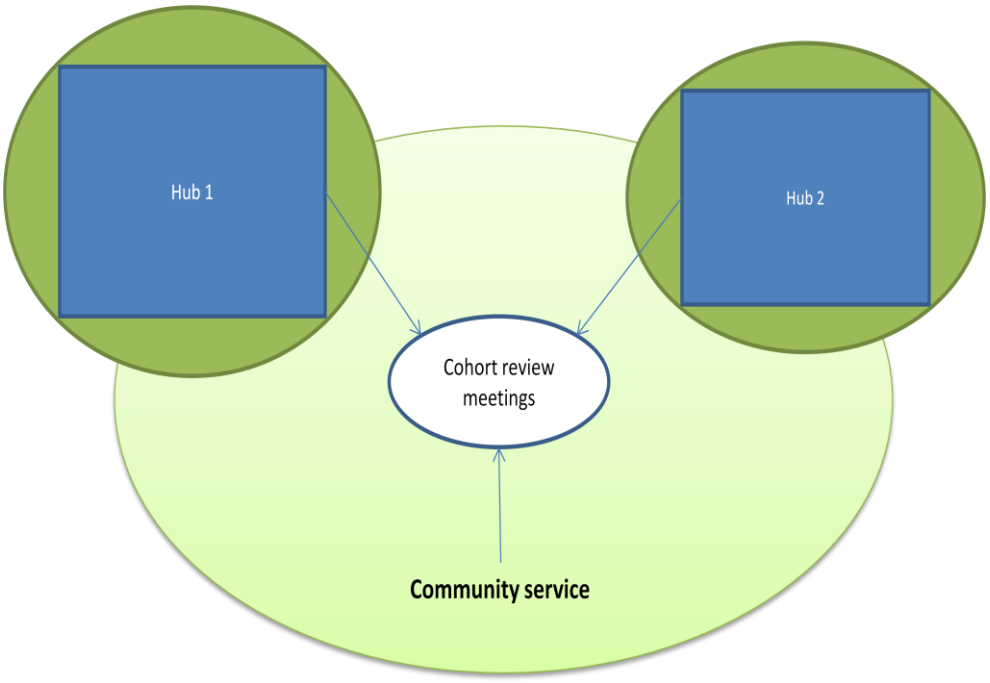
There is no formal access to social funds to sort out temporary housing during DOT for example and is done on an individual basis, proving time consuming and inefficient. Linking the PHE and the councils particularly the housing department may be a solution and an opportunity with Public Health now being a responsibility of local authorities.

Figure 3: Diagram of current organization of TB services in Triborough



Green shaded areas representing community outreach work from hospital

Figure 4: Diagram of possible re-organization of TB services



3.6 Operational pressure on services

Economies of scale are needed for some clinics, for example the paediatric and HIV co-infection service needs to be offered frequently to ensure clinically appropriate rapid access but is not used to capacity and as such 'wasting' resources. Efficient use of resources while maintaining access to treatment is a challenge. Similar expertise is provided by the different TB services in tri-borough at present which is unlikely to be cost efficient.

Whilst staffing levels at St Mary's and Chelsea and Westminster hospitals are perceived as adequate there are issues in covering short term vacancies such as maternity cover or sick leave due to the difficulty of recruiting qualified staff. Staffing levels at H&F are perceived as inadequate but may be due to the fact that staff are split across two hospital sites and additional referrals to CLCH nurses for out of borough patients for whom no payment is received.

Case complexity is not linked to payment at present and this means that inadequate funding is made available over all. There is very little capacity for home visits and community DOT as there is no provision for an outreach worker apart from the TB service at SMH. Some Outreach work is provided by the TB nurses but is inconsistent due to capacity issues and hospital centricity.

H&F faces similar pressures to the other services such as little proactive community activity related to TB. It is the only service with an explicit service specification. However the existing service specification expired in 2010 and is in need of updating. Work specified in the service specification that is currently not carried out includes performance reporting, new entrance screening, providing adequate nursing time per index case and raising awareness of TB in the community.

There is insufficient staff capacity to carry out this work. Other work that is currently provided by the CLCH contract is the result of the collaboration with the hospital service and is not part of the original service spec. TB Nurses at Charing Cross and Hammersmith are frequently seeing patients for whom they are not commissioned to provide care. In 2012 there were 123 index cases managed by the two sites, however only 68 of those were resident at H&F. Consultants are able to cross charge for the care they provide but there is no equivalent agreement for TB nurses in place, even though duty of care demands that all patients are seen. Despite the service specification defining the target population as those registered in the borough ALL patients alerted to Charing Cross and Hammersmith hospital are currently seen by the service, providing full support whilst on treatment for both active and latent TB cases to ensure continuity of care. There is other work not currently commissioned that the service is providing such as liaising with local GPs to ensure adherence and continued care provision. The team provides TB screening for patients prior to Anti TBF/ immunosuppressive therapy and work place screening as appropriate for staff who live outside the borough. Funding for CLCH staff is currently limited to staff costs

only and does not cover any other costs. However, there are no arrangements with the acute trusts at the Charing Cross and Hammersmith sites to provide consumables.

Historically CLCH were asked to provide the TB nursing service as they are ideally placed to strengthen the community aspect of the TB work. Theoretically clinics can be held in their own community settings to deliver DOT or see patients locally. CLCH has clinics in H&F that could be utilised to deliver screening and new entrant referrals or work alongside GPs to deliver more screening services. This is not done at present due to the lack of service level agreements and the way the service is organized and community work lacks priority in H&F similar to the services at St Mary's Hospital and the Chelsea and Westminster.

3.7 Active case finding

Active case finding includes contact tracing and screening high risk people such as those with social risk factors or from high prevalence countries. At present most new entrant referrals are from PHE/Immigration and very few are from GP practices even though recent evidence shows that GP practices are more effective at finding active and latent TB cases than any other services.

Acute trusts and PHE act in a specialist advisory capacity and are well placed to provide training for primary care staff and their own in house staff. This is however not a formal remit of the acute trusts at present. Raising community awareness through health promotion is not a priority for the acute trusts and there are established awareness programmes developed by TB Alert.

TB care for prison and custody sector was solely the responsibility of the prison health commissioner and is now the responsibility of NHS England.

Active case finding is an important part of containing TB infection in populations at high risk of contracting TB such as the homeless, drug abusers, alcoholics and prisoners. The acute trusts deal with the majority of contact tracing as part of active case finding. There is a London wide protocol for contact tracing. A minimum of 5 contacts per index case are recommended to be screened, which has been adopted from the NYC case management manual. Service providers work closely with PHE to determine their screening strategy.

Patients lost to follow up or non-compliant with treatment are the responsibility of the TB teams with support from the Find and Treat team (F&T team – a specialist outreach unit) and PHE. The F&T team and mobile x-ray unit based at UCLH deal with about 2% of TB cases in the minority of those with social risk factors, referred from other TB services for follow up, DOT or sorting out complex social issues. They work alongside over 200 NHS and third sector front-line services to tackle TB in people with social risk factors and scan over 10,000 high risk people annually as part of

targeted case finding. This service was set up the Department of Health in 2005 and since 2010 has been commissioned on a pan London basis. Camden CCG is now the lead commissioner on behalf of London's CCGs, as Find and Treat Services are now part of UCLH. It is operating in all London boroughs.

The TB Find and Treat (F&T) service supports the delivery of awareness raising activities among both hard to reach groups (with a higher risk of developing and transmitting TB) and front line care workers in frequent contact with these groups. It supports the early detection and diagnosis of TB among a population that would not be targeted for screening as part of the proposed screening programme. By seeking out people who have been lost to treatment and re-engaging them with services, Find and Treat supports the achievement of treatment completion indicators and reduces the risk of increasing rates of drug-resistant TB.

An evaluation of TB F&T by the Health Protection Agency was commissioned by the Department of Health in 2011. It compares the cost of operating the F&T service with the costs that would be incurred by the NHS if the service did not exist. The evaluation found that the F&T service is cost effective. It found that F&T has an incremental cost effectiveness of £6,100 - £10,000 per QALY gained. It obtains the same rate of successful outcomes as normal care, despite the greater complexity of cases. In addition, it reduces disease transmission by identifying cases before they become smear positive. 36% of MXU cases were asymptomatic on detection and would not have presented for treatment without the MXU. The F&T team provides a flexible outreach approach to care allowing opportunities to link services provided by numerous organisations into one individual package of care. It offers a unique pan-city co-ordination service. The liaison work F&T does with numerous allied agencies across the city is very important for finding hard to reach patients and keeping them on treatment.

F&T screen on average 930 homeless people per year in Westminster, over 25 TB peer supported screening sessions per year and around 10 training events and briefings for frontline third sector staff. F&T provide case management support and work with an average of 34 socially complex confirmed and suspected TB cases annually in Westminster alone. The main reasons for referral are to help locate patients lost to follow up care, to arrange housing (including admission to the TB Hostel set up by F&T for destitute patients), tracking patients through the criminal justice system and other social care interventions.

The team consists of 1 Clinical Lead, 1.5 WTE Reporting Radiographers, 1 social worker, 1 nurse, 2 Outreach workers, 1 mobile x-ray unit, 1 admin person. It is currently the only service dedicated to active case finding and has cultivated excellent relationships with hostels, TB hostels, GPs, homeless services, 3rd sector, SMH and ChelWest. It is the only consistent link between the homeless team and GPs for the homeless. There are 4 homeless outreach teams with links to Dr Hickey and Dr Reeds practice. They carry out regular hostel visits and rely on the F&T team for

support and expertise as contact tracing difficult. There is pooled funding for a mental health worker among the homeless teams. It could also be a vehicle for near patient spot testing for HIV, Hep C and deliver immunization in the future.

Prisons have recently been taken out of the remit of the mobile x-ray team even though x-ray units at the prisons are currently not operational. Previously this was part of the F&T work. Currently no TB screening takes place in prisons where TB rates are high because new dedicated x-ray equipment installed in the prisons are not operational. This needs to be addressed urgently.

3.8 Incident management

Incident control is a major part of active case finding and falls into the remit of the hospital teams in collaboration with PHE (or specifically the former HPA now part of PHE) in an advisory capacity. PHE is well placed to coordinate incidence control, review cases and liaise with service providers. It is also able to invoke the law on compulsory treatment. PHE maintains good relationships with all services but there is confusion over the role of PHE as funding source for incident control.

Funding of incident control falls to the service providers as part of the public health element of TB services, however there is no explicit contract for TB services, rather it is part of the acute trust contract or the CLCH community respiratory contract. This makes it difficult to agree responsibilities and funding arrangements in the absence of specific service specifications. Flexibility and structure are both needed for preparedness in the case of a suspected outbreak: flexibility because of complexity of cases and lack of boundaries, structure because there needs to be a defined pathway of action and funding to react quickly and adequately.

H&F dealt with a 186 potential exposures and 133 were screened in 2012 in 3 work places, 1 hospital, 1 congregation, 1 school, 1 custodial institution and 2 colleges. Corresponding figures for RBKC and Westminster were 38 identified and 33 screened and 395 identified, 112 screened. In Westminster 5 Food outlets were implicated in Westminster along with 2 schools, 1 college, 5 work places and 1 hospital. In RBKC 1 hospital and 2 work places were involved (figures provided by former HPA).
All teams have limited capacity to respond to potential outbreaks and responses require diversion of resources from the main service delivery (i.e. case management of known latent and active cases, their contacts, managing adherence, DOT, etc). There is no coordinated approach. Funding of extra capacity to manage an incident as advised by PHE is not formally in the budget. Whilst any incident needs a degree of flexibility at the moment it is ad hoc and much time is spent on finding resources in terms of funding and personnel by the team and PHE. Prevention and community incident assessment lack priority. Outpatient clinic appointments are offered to contacts identified through their workplace etc but if numbers are high contacts are referred to the TB clinic local to their area of residence.

3.9 TB prevention (via BCG vaccination)

The BCG is provided at birth by acute trusts (midwifery service during delivery) or by catch up clinics in the community provided through the CLCH health visiting service.

A universal BCG offer is now in place across the capital, with Chelsea and Westminster having recently started this as part of a CQUIN. The uptake is good at around 70- 90%, however there is no co-ordinated programme or even defined pathway for parents who decline to have the vaccination at the time of birth, are not offered it (rarely) or those who are born at home or outside the boroughs. The HPA has previously advised that London as a totality is an area of high risk even if TB rates fall under 40/100,000 hence universal BCG vaccines should be offered London-wide to provide TB protection in a mobile city with pockets of very high prevalence. However, recent national JCVI guidelines and PHE do not support this view.

Vaccine is hospital based and the vaccine is predominantly administered by midwives or obstetric nurses. At Westminster parent education at antenatal appointments to prepare them for the decision and hopefully increase uptake has been trialled by the school health nurse who's remit includes neonatal BCG delivery (personal communication Gillian McKormack February 2013) but nothing has been put in place formally. H&F trialled health visitor input for vulnerable women during antenatal visits.

The community BCG programme for all three boroughs is provided by Central London Community Healthcare (CLCH). Children who do not receive BCG at birth in hospital are supposed to be signposted to community BCG clinics by the health visitor service during the new birth visit (first two weeks after birth). Health visitors discuss BCG with parents during the new birth visit and subsequent contact visits in clinics until the child is 12 months old. An appointment is made for the child to receive BCG at a local BCG clinic.

Until the age of 1 the BCG can be given in the community by specifically trained nurses. The reason for the age cut-off is purely from a capacity point of view and the fact that after the first year it interferes with the routine immunisation schedule. Guidelines recommend that children in high prevalence areas, parents or grandparents born in a high prevalence country, unvaccinated immigrants from a high prevalence country should be vaccinated. There is no systematic process for identifying and screening new entrants from high-incidence countries, which is a national issue. Identifying children in 'at risk' categories falls largely to primary care but it's not clear how this is done. There is no dedicated service in the tri-borough to vaccinate children older than 5 years old.

Only Westminster has a programme for children older than 1, although future funding is uncertain. This comprised a community nurse post for catch up immunisations and case finding in 5 year olds through the school health

questionnaire. In 2012, 1215 questionnaires were sent along with the health questionnaire by school nurses to all reception aged children in Westminster and 349 were returned. Out of these, 147 met the screening criteria (having a parent or grandparent born in a high risk country with >40/100,000 TB cases), 5 had a BCG vaccine reported on RIO, 147 were excluded as having had the BCG after phoning parents (documentation in red book or BCG scar), leaving 101 children to be screened. Ten clinics were held in two venues (Lisson Grove health centre and Bessborough centre). 38 children did not attend, 31 were found to have BCG scar at visit and 32 were given the vaccine. Children who did not attend are not followed up further but are able to rebook. The most recent audit of this service showed that less than 1% of all children actually received the BCG vaccine. Eleven immunization clinics a month are offered in Westminster. The TB questionnaire is now sent out as part of the school entry health questionnaire in all 3 boroughs.

4. Summary

- TB is currently stable in the Tri-borough. The TB service needs to be seen as a service to exclude a TB diagnosis as well as diagnosing TB. Case finding and exclusion are resource intense and often complicated by being intermeshed with social care and affecting vulnerable adults. TB crosses boundaries and those most at risk of contracting TB are highly mobile. TB requires a flexible approach due to the nature of the disease but needs a more formal structure and pathways than currently exist.

- The service currently works very well together but draws on good will and relationships. There is generally a pragmatic, flexible and sensible approach to challenges and there is voluntary work force pooling. However, the current system cannot cope with increase in demand or respond adequately to outbreaks due to the flux in workload and segregation of services.

- Contact tracing and DOT is pragmatic rather than based on need, with SMH the only service offering an outreach DOT worker. Outbreak investigation and management needs to be formalised across boroughs and providers and finance planned proactively. The existing TB service is hospital centric with important community activities such as contact screening, DOT, follow up having lower priority than management of active cases.

- Latent TB is currently not addressed adequately and latent TB screening needs to planned and sufficiently funded to deliver results. Guidance on the testing for and management of latent TB in primary care is currently lacking and GP engagement and education needs to be improved. The third sector is not sufficiently utilized.

- Using the Find and Treat team to screen vulnerable populations and find people lost to follow up is an effective way of controlling TB in these patient populations but the service needs to be reliably funded and supported. The prison population is currently not screened at all even though prisoners present an important source of TB, particularly in its multi-drug resistant form. This needs to be addressed urgently.

- In terms of BCG vaccination there is a universal neonatal offer in place with good uptake. However there is a lack of community engagement and education, particularly in the antenatal period. There is lack of clarity and structure for vaccination after the age of 1 and 5.

5. Next steps

- A geographical analysis of patient location and distance to sites to determine the best location for the hubs and unification of Imperial services under one contract

- A cost gathering exercise to quantify costs associated with the TB service (including incidence management, community work for which there is currently no budget identified)

- Unbundling the TB service from the acute and community respiratory contracts to allocate appropriate funds out of the overall acute and community budgets

- Formulate a clear primary care strategy and identify funding needs for screening of latent TB in new entrants in primary care

- Address the lack of screening in prisons and allocate this service/ address the reason for lack of use of existing equipment

References

(1) Tuberculosis in the UK: Annual report on tuberculosis surveillance in the UK, 2013. London: Public Health England, August 2013.
(2) Clinical diagnosis and management of tuberculosis, and measures for its prevention and control. Nice clinical guideline 117. NICE 2011.
(3) Royal College of Nursing. Tuberculosis case management and cohort review. Guidance for health professionals. 2012.
(4) Old Disease- New Threat, APPG report. April 2013.
(5) Clinical diagnosis and management of tuberculosis, and measures for its prevention and control. Nice clinical guideline CG33 now replaced by 117. NICE 2006.

Appendix 1: Characteristics of the TB services in Tri-borough

Characteristics	St Marys Hospital	Chelsea and Westminster Hospital	Charing Cross/ H&F
Description	Tertiary referral centre for MDR and HIV TB and invasive sampling	Tertiary referral centre for TB	Tertiary referral across two hospital locations provided by CLCH nurses and acute trust ID consultant at Charing X and respiratory consultant and ID consultant at HH
Staffing	4.4 WTE TB Specialist Nurses (Case Managers) x1 Band 8a Lead nurse for TB at St Mary's (complex cases) x2.4 Band 7s Case management (complex cases) x1 Band 6 Case management (non complex cases) 1 WTE Specialist Community (New Entrant Screening) Nurse Band 7 vacant Outreach worker 1 wte Admin 1.6 wte (0.6 wte covered by agency)	Lead TB Clinical Nurse Specialist (band 8a) TB Clinical Nurse Specialist (band 7) TB Service Co-Coordinator (Band 4)	Charing Cross site: 2 nurses Hammersmith site: 2 nurses (x1 Band 8a Lead nurse for TB for complex cases, x1 Band 7 case management nurse for complex cases, 2 Band 6 case management nurses for non-complex cases) 1.6 (HCA / outreach / admin)
Expertise	Management of complex TB cases (MDR-TB), paediatric TB, renal, spinal or neurological TB including links with the renal team, co-infection with HIV, nominated leads in HIV and paediatrics	HIV co-infection MDR TB	
Catchment area	Westminster residents SMH informally covering W10 and 11 even though RBKC	Chelsea and Westminster, The Royal Brompton, Royal Marsden (Fulham rd site) via service level agreements SW10, SW1, SW1W,SW1X, SW3, SW5, SW7,W10, W11, W8 and part of W14.	H&F residents
Services	diagnosis, treatment, screening, infection control advice, incidence control coordination, case management and follow up	rapid diagnosis, treatment, screening, infection control advice, incidence control coordination across ChelWest, Royal Brompton and Royal Marsden, case management and follow up	Diagnosis, screening, active treatment, case management and follow up
Organisation		Weekly team meetings, monthly local MDT meetings with radiology and microbiology, quarterly sector cohort review meetings and Imperial MDT	Consultants refer into TB nursing services – sees adults and children even though initial CLCH service spec for adults only
Finance	Via acute block contract	Via acute block contract	Via acute block contract for consultants Plus via CLCH community respiratory contract for TB nurses
DOT	The team at SMH is the only team in Tri-borough with a TB dedicated outreach worker DOT provided in hours only	DOT provided by the TB nurses for selected patients (based on risk assessment and MDT). For patients who receive DOT good relationships with GPs, pharmacies and hostels to develop other options for DOT provision are essential	DOT provided in hours only by TB nursing team where necessary
Negative pressure facilities	31: Bronchoscopy suite (x1) Chest clinic (x1) HIV outpatient clinic (x1) A&E (x1) paediatric ward(x2) adult wards(x17) HDU/ITU (x8)	13: HIV in patient ward (x10) respiratory ward (x2) ITU (x1) A&E (x1) HIV day unit (x3)	14 across two hospitals rooms across 4 wards at Charing X (x6) (another 2 not in use) Infectious disease ward HH (x8)

Appendix 2: Activity data from TB service sites

	St Mary's Hospital	Chelsea & Westminster	Hammersmith & Charing Cross
5 yr av TB notifications *(2008-2012)*	121.4	59.6	123.4
Treatment completion rate *2011* pts	86.7%	90.9%	82.0%
UK born (Westminster) sector av 9.3% *(2012)*	17.5%	18.4%	16.3%
Av no TB pts with risk factors* *(2008-2012)*	19.3%	12.1%	9.7%

Appendix 3: Clinics across the TB service sites

	Imperial: SMH		**Chelsea & Westminster**		**Imperial: H&F**			
Day					*Charing X*		*Hammersmith*	
	am	**pm**	**am**	**pm**	**am**	**pm**	**am**	**pm**
Mon	Outreach DOT (9-5) Case management On call nurse 9-5 (ward and urgent referrals)	TB Screening Clinic (follow ups) 2 nurses	Directly Observed Therapy (DOT) Hospital and/or Community Telephone clinics	Home Visits Telephone clinics	Screening Clinic 08.30-16.00 X 2 nurses		Home visits, complex reviews (DOT)	Medical Clinic MDT X 1 nurse X 1 HCA
Tue	Adult Joint Medical/Nurse Clinic 3-4 doctors 2-3 nurses Home visits to DNAs, urgent referrals, weekly reviews (9-5)	HIV/TB Joint Medical/Nurse Clinic alternate weeks	Telephone clinics	HIV/TB Clinic and nurse follow up clinic	Nurse led clinic 08.30-18.30 X 2 nurses		Paediatric and Family Screen 09.00-17.00 X 2 nurses	
Wed	MDT Paediatric Joint Medical/Nurse Clinic alternate weeks Outreach DOT (9-5) On call nurse 9-5 (ward and urgent referrals)	Adult case manager (follow-up) clinic Evening LTBI clinic monthly	DOT – Hospital and/or community Telephone clinics	Contact Clinic	Medical Clinic X 2 nurses X 1 HCA Screen Reading X1 nurse	MDT	Adult Screen 09.00-13.00 X 1 nurse X 1 HCA	Nurse Led 13.00-17.00 X 1 nurse X 1 HCA
Thurs	TB Screening Clinic (2 nurses - news) Home visits to DNAs, urgent referrals and weekly reviews	Ward round Home visits to new cases and paediatric latent and active cases	Paediatric TB Clinic and nurse follow up Clinic	Medical TB Clinic and nurse follow up clinic	Nurse Led Clinic / Ward patient reviews Open day , home visits X2 nurses		Paed & Family Read X 1 nurse X 1 HCA	MDT
Fri	Adult case manager (fup) TB treatment clinic Outreach DOT(9-5) On call nurse 9-5 (ward and urgent referrals)	Case management	DOT – Hospital and/or community Telephone clinics	Contact Clinic. Monthly BCG clinic Telephone clinics	MDT (complex)	Home visits/ admin X 1	Adult Read X1 nurse morning only	

Appendix 4: Service specification for TB services

Only the contract with CLCH specifies the scope of TB nursing services (but not TB consultant services, which are part of the acute block contract with Imperial) within the service specification for respiratory services from 1st April 2009 to 31st March 2010. The TB Nurse Specialists commissioned through CLCH should deliver the following:

Patients diagnosed and referred in from Imperial consultants

- Ensure completion of TB treatment an chemoprophylaxis in pts referred from Imperial clinicians
- TB cases diagnosed will be seen same day within 2 working days
- Offer chemoprophylaxis to those under 35, over 35s chest x-ray at 6 and 12 months
- Offer DOT to TB patient based on risk assessment
- Provide case management to patients with TB and an identified group of those are at risk of developing TB through case finding and referral from key stakeholders
- Give education and advice to those with TB diagnosed by consultant and those closely associated with them

Patients referred in from GP with suspected TB

- Consultant clinic for every symptomatic child or adult within 5 working days
- Index case and their contacts: full assessment including history, Mantoux test and interpretation 48 to 72 hours later (2 appointments)
- Timely screening of those who have been exposed to TB (contact tracing – appointment should be made within 10 working days)
- Further investigation (blood, sputum, chest x-ray) and consultant appointment within 2 working days if positive Mantoux and symptomatic
- Further investigation (blood, sputum, chest x-ray) and consultant appointment within 3 weeks if positive Mantoux and asymptomatic
- Vaccination of children with BCG after repeat Mantoux at 6-8 wks if indicated, vaccination of adults if indicated by work place

Pro-active case finding and management in the community

- Participate in diagnostic screening for in/out patients
- Screen new entrants (Primary care referrals)
- Raise awareness of TB throughout the borough
- work in partnership with other health and social care providers to plan patient care

- play a central role in assessment, care planning, implementation, co-ordination, including case management and evaluation of care
- education programmes for prison services, hospital and community staff

Performance monitoring

TB Services will participate fully in the clinical governance arrangements to support clinical effectiveness and performance. Including allowing access to the service for audit and inspection purposes. Monthly performance reporting.

Appendix 5: Comparison of TB services by elements of service specification for TB services

Service specification	SMH	ChelWest	H&F
Patients diagnosed and referred in from consultants/ GPs: Ensure completion of TB treatment and chemoprophylaxis in pts referred from clinicians	yes	yes	Patients diagnosed with TB actively followed up by the Specialist Nurse thereby reducing the new to follow up ratio of consultant outpatients.
TB cases diagnosed will be seen within 2 working days for outpatients	for cases diagnosed on wards and in clinic (but not on the weekend) 2 days reasonable for outpatient work (i.e. weekends are clearly an exception)	yes	All patients starting treatment as an outpatient are seen on the same day. All inpatients are seen within 2 days of starting treatment.
Offer chemoprophylaxis to those under 35, over 35s chest x-ray at 6 and 12 months	yes according to protocol chest x-ray follow up is 3 and 12 months	yes	Yes Currently 8 patients on DOT for TB
Offer DOT to TB patient based on risk assessment	yes	Based on risk assessment offering patient choice i.e community or hospital DOT, or other methods like video assisted DOT (VOTS).	
Provide case management to patients with TB and an identified group of those are at risk of developing TB through case finding and referral from key stakeholders	all suspected active cases case managed	Yes, all suspected, active and chemoprox cases are case managed	Partially carried out
Give education and advice to those with TB diagnosed by consultant and those closely associated with them	yes	Provide education and advice to patients diagnosed with TB and TB chemoprophylaxis and for those closely associated with them. i.e. family/friends/work colleagues (if required).	yes
For patients referred in from GP with suspected TB: Consultant clinic for every high likelihood symptomatic child or adult within 5 working days as defined by imaging or symptom complex	yes if index of suspicion is high and with results from screening in nurse led clinic	5 working days not realistic to see a consultant physician	Nurses see new symptomatic referrals within 2 working days or 24 hours for those with suspected pulmonary TB. Patients are then seen by a physician within 1 week.

Service specification	SMH	ChelWest	H&F
Index case and their contacts: full assessment including history, Mantoux test and interpretation 48 to 72 hours later (2 appointments)	Patients are screened according to specific algorithms for symptomatic individuals and contacts and these include full history/ Mantoux/IGRA and imaging – the timelines are implicit within the algorithm and test modality.	Index case and their contacts: full assessment includes full history, Mantoux/IGRA/radiology / Sputums within specified timelines	Nurses take full history and risk assess each index case to determine contacts. Only those under 35 get a Mantoux test (not index cases as Mantoux can not diagnose active disease). Patients given a MT are followed up 48 -72 hours later. And / or IGRA testing and chest x-rays
Timely screening of those who have been exposed to TB (contact tracing – appointment should be made within 10 working days)	Contacts are prioritised according to risk (e.g. pulmonary versus extra-pulmonary and those most at risk e.g. children), as far as I am aware there is no specific mandate to screen all contacts within 10 working days	All patients are prioritized and given appointments according to date of exposure and risk.	Screening offered to contacts – for pulmonary Smear + contacts this is within the 10 day period and followed up at 3 months. For non smear + index cases appointments offered within 4 weeks, capacity unable to provide all contacts within 10 days.
Further investigation (blood, sputum, chest x-ray) and consultant appointment within 2 working days if positive Mantoux/IGRA/ symptomatic	Patients screened to specific algorithms and these further investigations are done at the initial visit rather than waiting for Mantoux results, patients are appointed to clinic within 1-2 weeks depending on index of suspicion.	Screened by the TBCNS if referral is urgent and patient is symptomatic. Two working days to see a consultant physician not realistic.	Yes. New GP referrals / contacts that symptomatic seen within 24 hours by TBNS. Consultant appointments are weekly, however access to registrar within same time frame as TBNS.
Further investigation (blood, sputum, chest x-ray) and consultant appointment within 3 weeks if positive Mantoux and asymptomatic	Those that are asymptomatic with positive TST / IGRA may be appointed within 1-4 weeks (evening LTBI clinic, those waiting to commence anti TNF are usually appointed sooner 1-2 weeks 3 weeks arbitrary, a month ok	Symptomatic patients get priority, however If clinic appointments available these will be offered to this group. Otherwise wait can be between 2-4 weeks.	
Vaccination of children with BCG after repeat Mantoux at 6-8 wks if indicated, vaccination of adults if indicated by work place	SMH provide BCG to contacts and NE (and as defined by NICE), not routine BCG for children, workplace travel etc	BCG given to patients that are screened through contact clinic or children 'at risk' on an individual basis	Only since April 2012 have BCGs been given to children. Employee Health commissioned to do work place BCGs for Health care workers.
Pro-active case finding and management in the community: Participate in diagnostic screening for in/out patients	yes	Yes	Patients are seen as contact. No pro active case finding happening. All cases are reactive from contacts.

Service specification	SMH	ChelWest	H&F
Screen new entrants (Primary care referrals)	Yes, if referred but these are ad hoc	Yes, only if referred by primary care	No, this is not taking place on the scale required. We only see referrals from PHE / Immigration. Very few come from GPs
Raise awareness of TB throughout the borough	Not part of an acute service specification and would be best encompassed by a strategic overview for public health	No, this would not be considered the remit of secondary care.	No teaching for any HCPs is taking place. No proactive sessions for patients or hard to reach groups.
Work in partnership with other health and social care providers to plan patient care	yes	Yes	Work closely with all health care providers to ensure TB patients receive appropriate care. Not working with enough GPs / Community Health Care Providers to improve and promote the service.
Play a central role in assessment, care planning, implementation, co-ordination, including case management and evaluation of care	yes	Yes	yes
Education programmes for prison services, hospital and community staff	not applicable to SMH team yes around WTBD and in response to requests annually response to requests from CLCH HIV forum	No prison in RBKC, Occasional requests from community groups. Hospital in-house education for medical and nursing staff	no
Governance Improving Productivity Increase in Case Management caseload Increase numbers of new entrants screened from 2008/9 baseline 40 index cases to 1 TB Nurse New Entrant Screening Target 4 week wait	New entrant screening is currently occurring on an ad hoc basis as the provision of new entrant screening will have to be strategically decided on and funded – the current view is that this should occur in primary care with IGRAs and referral into local service as per an agreed algorithm. This is currently not funded within inner NWL	We adhere to the 2/52 target for GP referrals for suspected Pulmonary cases must have an appointment within 2/52 of being referred by the GP, have to be seen and assessed by a member of the TB team. New entrant screening occurs when a GP sends a referral (this is adhoc).	This target would be for New Entrants, BCG and screening patients as index patients - new TBs are seen within 2 working days.

Service specification	SMH	ChelWest	H&F
Keeping patients in TB Treatment Lost to follow up reduced Completion of TB treatment improved Active DNA follow up / reduction in DNA's / DNA policy, Reduction from 2008/9 baseline, Evidence from audit & LTBR	All these aspects are certainly an issue to measure and are published but for a service do not necessarily relate to any borough and should be measured per service	Some of this data is available via LTBR and some would need to be collated locally for each service. C&W team make a huge effort to improve on the listed aspects of care continuously.	1.6 band 3 Vacancy posts currently out for recruitment. Mix HCA / admin roles to reflect need of service and allow reaction to demand of outreach worker. DNA rate has reduced from 34% to 4% in 6 months Currently no Lost to follow ups.
The TB Service will participate fully in the clinical governance arrangements to support clinical effectiveness and performance. Including allowing access to the service for audit and inspection purposes.	Via the cohort review process	Via the cohort review process	Via the cohort review process
Performance Reporting Performance reporting will be monthly, the key to reporting is that it provides analysis of the information	no	C&W performance team request certain data quarterly	no

Appendix 6: Question guide for service providers

Location of service (if on multiple sites, please indicate)

Type of commissioning: part of block contract, individual contract

Is there a service specification for your service?

Outline the services you provide

Referral- how do patients access your service(s) – e.g. Open-access, referrals from other organisations/professionals (please specify)?

Outreach work

Screening- Do you deliver it? Who do you screen? How are they referred to you? How do you deliver screening?

Contact tracing- What is your role in risk assessment and contact tracing?

Advice to other clinicians in hospital

DOT- do you offer it? How? What models do you use?

Immunization- do you offer it? How is it delivered and to whom?

How do you collaborate and interface with other services?

Is there anything that is unique to your service?

Commissioning- are the current commissioning arrangements clear? Who is the lead commissioner for your service? Do you meet regularly with them? Do you have clear lines of communication with the commissioners? How do you interact with the commissioners? What would help improve the current arrangements

Configuration- Are the current configuration of TB services effective and fit for purpose? What would help improve them?

Staffing- Is the current staffing adequate? If not, what would improve the current staffing- new roles, more wte in existing roles?

Standards and targets- Do the current standards and targets capture the essence of the service? Are they Specific, Measurable, Accurate, Relevant, Timely? What changes should be made?

Community outreach- Are you satisfied with the current arrangements for community outreach? If not, what should change?

DOT- Are the current arrangements for DOT clear? Are they satisfactory? If not, what

should change?

Immunisation: Are the current arrangements for BCG immunisation fit for purpose? If not what should change?

Prevention

Housing

Incident management: Are the current arrangements for BCG immunisation fit for purpose? If not what should change?

Pathways- Are the current pathways for TB treatment, immunization and outbreak management in the Tri-borough area clear? If not, what elements need clarification? What would you recommend?

Any other comments/suggestions