Improving patient outcomes in TB

P160 TREATING TB PATIENTS WITH NO ENTITLEMENT TO SOCIAL SUPPORT—WELCOME TO THE SOCIAL JUNGLE

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Background In the UK, TB medication is free but access to additional resources necessary for treatment completion is conditional. Patients with no recourse to public funds (NRPF), including undocumented and some European Economic Area migrants, have no rights to benefits, public housing or social care. The International Union Against Tuberculosis and Lung Disease (IUATLD) recommends that undocumented migrants with tuberculosis (TB) should receive free treatment and not be deported until completion of treatment. We used case reviews to explore how this guidance translates into current practice in London.
Methods We reviewed clinical, social circumstances and treatment outcomes for 32 NRPF patients with active TB referred from September 2007 to June 2010 to Find and Treat, a pan-London multi-disciplinary project developed to strengthen TB control in hard-to-reach groups.
Results The case reviews demonstrated that, while TB medication is free, lack of access to public funds severely compromises treatment access, completion and cure. Patients are unable to pay for transport to attend clinic appointments, buy food or access accommodation. Many (7/32) in fact were sleeping rough. More than a third (10/32) had resistant forms of TB, including 3 to a single drug (Isoniazid) and 7 with Multi Drug resistance (MDR). Despite close working relationships with Border Control Agencies, threat of deportation is a reality. Nine patients (28%) were lost to follow-up care, of which almost half (4/9) have never been found. Consequences included unsupervised medication, street homelessness, hospital admission (including for malnutrition) and treatment interruption and default.
Conclusion Though ensuring access to free treatment, current guidance does not address the wider determinants of health in tuberculosis. This results in severe inequity of care, and poor treatment outcomes with potentially serious public health implications. Political commitment to provide for basic social needs as well as free medication for all patients is required to effectively control TB.

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P161 GLOBAL PREVALENCE OF CHRONIC PULMONARY ASPERGILLOSIS (CPA) FOLLOWING PULMONARY TUBERCULOSIS (PTB)

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Background One of the sequelae of PTB is the development of CPA, with or without an aspergilloma. We estimated the global 5 year period prevalence of CPA.
Methods Estimation of the number of cases of PTB and deaths was made by the WHO. The frequency of pulmonary cavities after PTB treatment varied from 8% (Vietnam) to 35% (Taiwan), with rates in South Africa and US of 21–23% and Brazil of 30%; we used a rate of 22% except in Europe (12%). CPA (pulmonary cavity(s) + positive Aspergillus serology) annual incidence was estimated from PTB cases with cavities (22%) and without cavities (2%). Annual mortality following PTB varies from 5% (Denmark) to 15% (Uzbekistan) and is higher in HIV infected patients (26%) and those with MDR PTB (12%). We calculated the 5 year prevalence using annual attrition rates of 10–25%.
Results In 2007, WHO estimated 7.7M PTB cases globally, with 77.1% 1-year survival. We estimate that 372 385 patients worldwide developed CPA following PTB in 2007, distributed 11 420 (Europe), 12 610 (Americas), 98 551 (Africa), 20 615 (E. Mediterranean), 83 815 (W. Pacific) and 145 372 (SE Asia). In the UK, the annual new CPA caseload from PTB is estimated to be 118 cases with an estimated 5 year period prevalence of 433 cases. 5 year estimated CPA prevalence using median estimates above was:

	Annual attrition (death or surgical resection) rate		
WHO region	10%	15%	25%
Global	1372457	1173881	852048
Europe	42091	36001	26131
Americas	46475	39751	28852
Africa	363219	310667	225494
E. Mediterranean	75980	64987	47170
W. Pacific	308908	264213	191776
SE Asia	535783	458263	332625

Sensitivity analyses using 10% or 30% rates of cavity formation after PTB and CPA rates in those without cavities (1% or 4%) alter the estimates from a low global 5 year prevalence rate of 546 844 to a high of 1 786 421 patients living with CPA, at a 15% attrition rate.
Conclusions CPA following PTB is a significant public health problem in Africa, W. Pacific and SE Asia. A lack of contemporary research limits the precision of estimates regionally and globally.

P162 HOW MANY AND HOW MUCH? ASSESSING RESOURCE UTILISATION IN MULTI-DRUG RESISTANT TUBERCULOSIS (MDR TB) MANAGEMENT USING ROUTINELY COLLECTED HOSPITAL DATA

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Introduction MDR TB is rare in the UK, yet its incidence is rising. Although treatment is intensive, prolonged and generally costly for the patient and the treating TB centre, more TB services are offering such care. In the last 10 years, despite considerable relevant health service reorganisation, there has been no UK-based assessment of its resource implications, or guidance on how to determine this. Here we explore how routinely collected hospital data may assist in mapping service utilisation and also provide possible quality indicators of care.
Methods We performed a retrospective case-control study using MDR TB patients starting treatment between 2004 and 2007. Cases were matched to drug sensitive TB controls (1:2) treated in the same regional centre using age, sex, site of disease, HIV status and year of diagnosis. Data were abstracted from hospital clinical systems and matched analysis of service utilisation was performed.
Results 9 patients (8 pulmonary and 1 spinal) were included in the MDR TB and 17 (16 pulmonary and 1 spinal) in the control group. All patients completed treatment successfully. The Abstract P162 Table 1 indicates that MDR TB patients used a larger number of anti-tuberculosis drugs for longer, attended outpatients more frequently and made considerably greater use of biochemical, haematological and simple radiological assessments. However, there was no significant difference in total inpatient length of stay. All

MDR TB patients reported adverse events requiring a change to medication or additional therapy to control these effects—this compared to 33% of controls ($p<0.05$). Drug-induced hepatitis was no more frequent (22% vs 18%, MDR vs controls, $p=0.75$). Some patient safety investigations, such as antibiotic drug levels and audiometry, were only performed in MDR TB patients.

Abstract P162 Table 1

	MDR TB n=9 Median (range)	Drug sensitive TB n=17 Median (range)	p-Value
Inpatient total stay (days)	9 (0, 85)	0 (0, 58)	0.09
Number outpatient attendances	20 (11, 38)	8 (2, 34)	0.007
Number of anti-tuberculosis drugs	5 (4, 7)	4 (3,4)	<0.001
Duration of treatment (months)	19 (16, 24)	6 (6,15)	0.001
Full blood count	17 (1, 33)	5 (0, 39)	0.01
Liver function tests	25 (6, 38)	7 (1, 37)	0.001
C reactive protein	19 (0, 31)	5 (1, 36)	0.05
Sputum Acid Fast Bacilli	3 (0, 21)	0 (0, 17)	0.12
x-Ray chest	6 (1, 9)	2 (1, 9)	0.01
CT chest	0 (0, 1)	0 (0, 3)	0.47

Conclusion MDR TB remains a highly resource-intensive area of TB care. Modern NHS data systems are capable of recording utilisation and timing of specialist tests. These simple measures can allow services to develop patient-focussed quality outcomes as well as feedback results to clinicians to improve cost-effectiveness in specialist MDR TB management.

P163 INCIDENCE AND CLINICAL RELEVANCE OF NON-TUBERCULOUS MYCOBACTERIA ISOLATES BASED ON 10 YEARS EXPERIENCE AT YORK HOSPITAL, NORTH YORKSHIRE (UK)

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Background Non-tuberculous mycobacteria (NTM) are widely distributed in the environment and are difficult to diagnose and treat. Previous non-UK studies have reported increasing incidence and geographical variation in NTM isolates.[1] We characterised the frequency and clinical relevance of positive NTM cultures in a large UK hospital and the effect of introducing a new liquid culture.

Methods We examined the notes of all patients from whom NTM had been isolated between July 1999 and September 2009. Diagnostic criteria for NTM disease published by the American Thoracic Society (ATS) were used to determine clinical relevance.[1]

Results NTM was isolated from 100 patients. 91 (91%) were respiratory tract samples. 14 (15%) of these met ATS criteria for NTM pulmonary disease. MAC (38%), *M. xenopi* (19%) and *M. malmonese* (11%) were most common. Of these, 14%; 6% and 30%, respectively, met the ATS criteria. The most clinically relevant species were *M. bovis* (1/1; 100%), *M. simlae* (1/2; 50%), *M. kansasii* (2/6; 33%) and *M. malmonese* (3/10; 30%). Cough ($p=0.02$) and night sweats ($p=0.027$) were associated with clinical relevance. Being asymptomatic was linked to not meeting ATS diagnostic criteria ($p=0.029$). Pre-existing pulmonary disease ($p=0.012$), ABPA (0.019) and dyspnoea ($p=0.013$) predicted having a second positive sputum.

The annual NTM isolates increased over 10 years. The liquid culture system was introduced in September 2006. Using a χ^2 comparison test there was no statistically significant difference in clinically relevant isolates pre and post September 2006 ($p=0.633$).

Conclusion This is the first study of NTM isolates in the north of England. Our study shows prevalence of clinically relevant disease, with isolates of *M. kansasii* and *M. malmonese* most likely meeting ATS criteria. MAC was most prevalent (38%). Since the introduction of a new liquid culture system the number of isolates increased, but the clinical relevance did not. The spread of species isolated differed from previous studies[1] which highlights the geographical variation and the importance of regional data.

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P164 ENABLING NEXT DAY PROCESSING OF BLOOD SAMPLES WITH T-SPOT.TB

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Introduction The T-SPOT®.*TB* assay involves the collection of peripheral blood samples for analysis of the T cell response to TB-specific antigens. Traditionally the blood sample has been required to be processed on the same day as it is collected. This study was designed to investigate a new procedure, for use in combination with the T-SPOT.*TB* assay, which offers the potential to initiate the antigen stimulation the day following blood collection, thereby allowing overnight transportation of samples from the point of collection to a processing laboratory.

Methodology Subjects were enrolled at two sites; one in the UK and one in South Africa. Patients all provided informed consent and a brief medical history; blood samples were taken into two lithium heparin tubes.

One tube was selected for immediate testing by the T-SPOT.*TB* assay. The second tube was stored overnight at room temperature. Immediately prior to testing the stored blood sample, the T-Cell *Xtend* reagent (Oxford Immunotec Ltd, UK) was added to the sample and incubated for 20 min.

Results A total of 208 participants were enrolled into the study and 3/208 (1.4%) subjects were excluded due to blood collection errors at enrolment. Of the 205 samples available for analysis, 10/205 (4.9%) failed to yield a valid T-SPOT.*TB* test result with either the fresh blood (3 samples) or the stored blood (7 samples) leaving 195 paired results with both fresh and stored blood samples for analysis (see Abstract P164 Table 1).

Abstract P164 Table 1 Overall agreement in the T-SPOT.TB assay result between fresh and overnight stored blood samples (n=195)

		Stored blood	
		Positive	Negative
Fresh blood	Positive	44	2
	Negative	2	147

The overall agreement for the study was 97.9% (191/195); 95% CI 94.8 to 99.4%, with a kappa value of 0.943 which indicates excellent agreement.

Conclusions The T-SPOT.*TB* assay on overnight stored blood samples, when combined with a pre-incubation step utilising the T-Cell *Xtend* reagent, yields results that are equivalent to those obtained with fresh blood samples. This allows, when combined with overnight shipment to a central testing facility, greater flexibility in when and where blood samples can be collected.