REPORT

OUTBREAK OF ISONIAZID RESISTANT MYCOBACTERIUM TUBERCULOSIS IN NORTH LONDON 1999 – 2004

EXECUTIVE SUMMARY REPORT
KEY POINTS AND RECOMMENDATIONS

Report prepared by Drs Angharad Davies, Michael Ruddy, Fiona Neely and Ruth Ruggles on behalf of the Outbreak Control Committee, with Dr Helen Maguire (Chair of Committee).

Electronic and hardcopy of this executive summary report and of a fuller main report which is aimed at professionals working in TB services as well as in health protection can be obtained from HPA London Regional Epidemiology Unit

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TABLE OF CONTENTS

1 INTRODUCTION

This report updates the previous interim reports of June 2001 and November 2002. It documents the outbreak to end 2003, the problems encountered and the main steps taken to control the outbreak.

Since 2000 many changes in the infrastructure of the NHS have occurred, including the creation of Primary Care Trusts (PCTs) and Strategic Health Authorities (SHAs), and the Health Protection Agency (HPA). In this report we hope to inform these new health economies and seek to ensure good communication and a shared understanding of the roles and responsibilities of all parties in controlling the outbreak. Particularly relevant to this are the recommendations in Sections 3 and 4.

We think that the lessons learnt are important for general TB management, and are not unique to this outbreak. The recommendations have direct relevance for TB control in London, and we would urge TB networks to implement them.

2 EXECUTIVE SUMMARY

2.1 Background

2.1.1 Incident

- Outbreak of isoniazid-resistant (INH-R) tuberculosis in London. The main focus has been in Enfield and Haringey in North Central London. Recent evidence of migration of the incident affecting North East London.
- Most cases started to appear in 1999 – 2000. The earliest case was in 1995 (diagnosed retrospectively). There is a strong association with drug use and prison detention. Some early cases had in common car sales and the music industry.
- There were 155 cases (confirmed or probable) as of November 2003:
    - 132 cases in London
    - 23 cases outside London
- In addition, there were 16 clinical cases in London (epidemiological links, typing awaited) and 34 contacts in London on chemoprophylaxis.

2.1.2 Outbreak control committee (OCC)

- The OCC was set up in 2000 to aid the investigation and control of the INH-R TB incident. An OCC subgroup investigated those aspects of the incident specific to prisons.
- The terms of reference (TOR) and membership have recently been revised in order to:
    - Clarify the OCC's roles, responsibilities and lines of accountability;
    - Strengthen the implementation of its recommendations.

2.2 Outcomes of London cases as of November 2003 (n=132)

- Sixty-three cases were known to have completed treatment (47.7%).
- Two cases of multi drug resistant TB (MDR-TB) have developed in patients with poor adherence to treatment. A third case of community acquired MDR-TB was diagnosed in January 2004.
- Two deaths attributable to TB.
- Nine patients were lost to follow-up. Of these, 7 were thought still to be living in London.
- There is evidence of transmission within hospitals.

2.3 Summary of key recommendations

2.3.1 Early identification of incident cases

The risk of TB transmission is reduced by early diagnosis of cases. Priorities are to:

- Increase early presentation and diagnosis by raising awareness in at-risk groups and the professionals working with them, both in prisons and in the community.
- Increase the proportion of TB diagnoses with microbiological confirmation.

2.3.2 Treatment

The approach to TB treatment should be to 'step down' with proven good adherence, rather than to 'step up' when problems develop. Ensuring treatment adherence remains a challenge in this incident. Incident control depends on appropriate treatment for isoniazid-resistant TB and treatment completion. Poor treatment adherence increases the risk of TB transmission and of the development of MDR-TB. Priorities are:

- Use a case management approach.
- Use Directly observed therapy (DOT) at outset for patients who:
    - Are at risk of non-adherence (BTS criteria);
    - Are identified as part of INH-R TB incident *unless* the clinician is confident that patient is adhering to treatment and has demonstrated this.
- Provide support, outreach and incentives as appropriate. The literature shows that these measures improve adherence.
- Monitor DOT. Where DOT is failing adjust support measures and incentives as appropriate. Use sanctions when needed. Supervision of treatment can be 'stepped down' with good adherence.
- Ensure that resources are in place to provide support and incentives as necessary. These measures are less expensive than detention, hospital care and the treatment of MDR-TB.
- Provide TB treatment without charge to all patients.

2.3.3 Contact tracing and treatment

Contact tracing and treatment are important for early diagnosis and to reduce TB transmission.

- No change to current recommendations for contact tracing. However the results of the contact studies are being reviewed and will be discussed at the OCC meeting in June 2004.
- Close social and work contacts should continue to be included in contact tracing for this incident.

2.3.4 Incident monitoring and communication

The OCC will continue to meet twice a year and maintain responsibility for overall monitoring and co-ordination of incident management. The following are recommended to enhance existing measures:

- Review existing incident database to provide robust and timely information on outcomes and adverse events.
- Undertake qualitative evaluation of reasons for adverse events. Could use care pathway approach to highlight areas of risk and as evaluation tool.

3 RECOMMENDATIONS

Most of the recommendations apply to general TB control in London, and not just to the management of this incident. We urge all TB networks in all the London sectors to adopt them, and not just those sectors most affected by the incident.

All the recommendations are given in more detail in the tables in the following pages. Listed below are those recommendations that we propose are given highest priority.

The recommendations fall broadly in four categories of incident control:

- Early identification of cases
- Appropriate treatment and treatment completion
- Contact tracing and treatment
- Incident monitoring and communication

2.4 Early identification of incident cases (Table R1)

The risk of TB transmission is reduced by early diagnosis of cases. Early diagnosis depends on early presentation and appropriate clinical response. Establishing links to the incident and appropriate management depend on microbiological confirmation of the diagnosis with drug sensitivities and molecular typing.

2.4.1 Priorities:

1. Increase early presentation and diagnosis by raising awareness in at-risk groups and the professionals working with them, both in prisons and in the community.
2. Increase the proportion of TB diagnoses with microbiological confirmation.

2.4.2 Key agencies and individuals:

- TB network managers
- TB clinical teams
- Prison-liaison nurse
- HPA-HPUs
- Primary Care Trusts
- HPA MRU

2.5 Treatment (Table R2)

The approach is now to ‘step down’ treatment where good adherence is demonstrated, rather than ‘step up’ after problems arise. Incident control depends on appropriate treatment for isoniazid-resistant TB and treatment completion. Poor treatment adherence increases the risk of TB transmission and of the development of MDR-TB.

Ensuring treatment adherence remains a challenge in this incident. Current treatment completion in this incident is 48%. The London TB Group set a general standard for treatment completion of 90% in March 2001. There are five cases of multi-drug resistant TB (MDR-TB) in this incident. Four are the result of poor adherence to treatment. The fifth case is of most concern, as there is evidence of likely transmission of MDR-TB in the community from another case who had acquired rifampicin resistance.

2.5.1 Priorities:

1. Use a case management approach.
2. Use DOT at outset for patients who:
    a. Are at risk of non-adherence (BTS criteria);
    b. Are identified as part of INH-R TB incident *unless* the clinician is confident that patient is adhering to treatment and has demonstrated this.
3. Provide support, outreach and incentives as appropriate. The literature shows that these measures improve adherence.
4. Monitor DOT. Where DOT is failing adjust support measures and incentives as appropriate. Use sanctions when needed. Supervision of treatment can be 'stepped down' with good adherence.
5. Ensure that resources are in place to provide support and incentives as necessary. These measures are less expensive than detention, hospital care and the treatment of MDR-TB.
6. Provide TB treatment without charge to all patients.

2.5.2 Key agencies and individuals:

Provision of social, housing, and benefit support require liaison with non-NHS agencies.

- TB clinical teams
- TB network managers
- Prison TB health care workers
- HPA-HPUs
- PCTs
- StHA

2.6 Contact tracing and treatment (Table R3)

The findings of two contact studies are currently being reviewed, and will be discussed at the June 2004 OCC meeting. The OCC recommends that contact tracing in this incident continue to include close social and work contacts.

2.6.1 Key agencies and individuals:

- Prison health care teams
- TB clinical teams
- HPA-HPUs
- PCTs

2.7 Incident monitoring and communication (Table 4)

2.7.1 Priorities

1. Review existing incident database to provide robust and timely information on outcomes and adverse events.
2. Undertake qualitative evaluation of reasons for adverse events. Could use care pathway approach to highlight areas of risk and as evaluation tool.

2.7.2 Key organisations

- HPA London
- LTBR (HPA London)
- Prison Health Policy Unit (Mary Piper) and HPA-Colindale/Prison Health Surveillance Unit (Alistair Story, Jane Jones)
- HPA MRU

Section 4: OCC RECOMMENDATIONS

Table R1: Identification, early diagnosis and microbiological confirmation of cases

Recommendation	Action	Rationale	Responsibility	Comments
IDENTIFICATION CASES CONNECTED WITH INCIDENT				
Presentation to TB services				
Raise awareness of TB symptoms, signs and diagnosis in at-risk groups and service providers to these groups	Use of written educational materials and other communications, and face-to-face training Target: At risk groups directly Service providers and other agencies working with at-risk groups e.g. hostels, drug and alcohol teams, primary care, A&E staff Prison governors, health care teams and other prison staff	Early presentation, diagnosis and treatment reduce transmission and improve health outcomes Lack of awareness among alcohol users about TB symptoms found in North Central London	TB network managers Prisons: London: Community prison liaison nurses National: Prison Health Policy Unit, Senior Public Health Advisor (Mary Piper) PCT Health Promotion and Primary Care Teams	Outside London community – see Communication and Monitoring below
Prisons: Include screening for TB in all new prisoners	Screen all new prisoners for TB using new reception screening tool for prisons Community contact tracing is addressed in Table R3 Prison measures to reduce transmission addressed in Table R3	Early identification of cases improves health outcomes and reduces transmission New incident cases continue to be identified in prisons both in and outside London. Prisons appear to be a major reservoir of ongoing outbreak.	NC London: Prison nurse with responsibility for TB PCTs Prisons, other London sectors and nationally: Prison health policy unit, Senior PH Advisor (Mary Piper) HPA London – liaison with HPUs outside London	Exploring access to London TB Register (LTBR) by prisons – perhaps via local community TB team who already have access or via HPU

Recommendation	Action	Rationale	Responsibility	Comments
Screen all new prisoners for TB using mobile x-ray within pilot	Support implementation of mobile x-ray unit (MXU) in prisons	The MXU can be used to screen those high-risk groups identified as important in the outbreak	TB in prisons surveillance unit (HPA-Colindale – Alistair Story)	Mobile digital x-ray unit pilot to start in late 2004 with volunteer prisons. Will not be a practical tool for this incident in the short or medium term
Prisons: Notify new cases TB to Community TB teams, Health Protection Units and LTBR	Prison TB liaison to notify community TB liaison directly and using form developed by HPA-Colindale Prison Health Surveillance Unit Community TB liaison to ensure entry on LTBR and that CCDC is aware	Early diagnosis and treatment, particularly of sputum positive cases reduces risk of transmission	Prisons will designate a member of healthcare staff to liaise with community TB team and CCDC Community prison liaison nurse TB in prisons surveillance unit (HPA-Colindale)	Forms for this were distributed to all prisons Responses will be monitored and evaluated by Ruth Gilbert, Prison Surveillance Unit CDSC Colindale
DIAGNOSIS TB AND MICROBIOLOGICAL/MOLECULAR CONFIRMATION THAT CASE IS PART OF INCIDENT				
Microbiological confirmation of pulmonary TB cases **Referral of all mycobacterial cultures to HPA MRU (to allow identification, drug sensitivity testing and typing)** **Drug resistance testing by the HPA for *Mycobacterium tuberculosis* should remain free to the NHS**	Microbiological confirmation of TB cases should be obtained whenever possible Possible standards for microbiological confirmation: Current level nationally 50-54% WHO Recommends 65% (of all pulmonary cases) Netherlands have achieved 85%	Cases that are part of incident identified by molecular typing of INH-R and MDR isolates The management of resistant cases is different to fully sensitive/microbiologically unconfirmed cases of TB Identification of cases as part of this incident may influence clinical management and incident control measures	TB clinical teams Trust microbiologists HPA HPA MRU	Methods used vary across trusts in London. National review ongoing These ideally should include liquid culture media
	Monitor proportion of cases in London with microbiological confirmation		HPA London Regional Epidemiologist (HM)	Explore integration of microbiology information with LTBR

Recommendation	Action	Rationale	Responsibility	Comments
Molecular typing of all INH-R and MDR cases to identify those that are related to this incident	RAPET/RFLP typing of: All INH mono-resistant isolates in London and MDR isolates from North London. Done on request for similar isolates outside London and for contacts of confirmed cases	Identification of cases as part of this incident may influence clinical management and incident control measures Incident monitoring and surveillance	Trust laboratories: HPA Microbiologist (Bharat Patel) Resistance and molecular typing: HPA MRU	Prospective typing is not yet a routine service, although anticipated that will be when national typing scheme is introduced. The HPA MRU is currently prospectively RAPET/RFLP typing all INH-R as well as all MDR isolates in London Malcolm Yates will prioritise resistant cases in North London and other cases brought to his attention
Report microbiology results, drug resistance and molecular typing to TB clinicians within 2 months		As above	HPA MRU	HPA MRU aims to send resistance results to trust within 2-3 weeks of receipt of isolate Set desirable target for identification of case as part of incident Assess current time from treatment start date to notification of clinical teams Agree minimum frequency for batching of typing analyses
Continued overleaf				

Recommendation	Action	Rationale	Responsibility	Comments
Continued from previous page	Trust labs and HPA MRU to implement recommendations of pathology modernisation review	Adopt best practice for rapid and accurate diagnosis of TB in London	HPA and NHS Microbiologists (e.g Bharat NC, Patel, Albert Mifsud NE) SHAs	
Communication of new cases in incident to TB teams, HPA-London, HPA-HPUs and prisons	See flowchart (addendum to table R2)	Monitor incident Case management and contact tracing procedures may be affected Update incident database	HPA-London HPA MRU Lead TB clinician Case manager Prison in-reach nurse and prison nurse with responsibility for TB	
Regular updates on incident progress	Regular updated information on incident epidemiology, adverse outcomes and new control measures for OCC members & HPA-HPUs		HPA-London (Helen Maguire) to provide reports to HPA-HPUs, sector managers and other OCC members OCC members responsible for further onward dissemination of information to local colleagues	

ISONIAZID RESISTANT TB OUTBEAK: CASE INFORMATION FLOW CHART

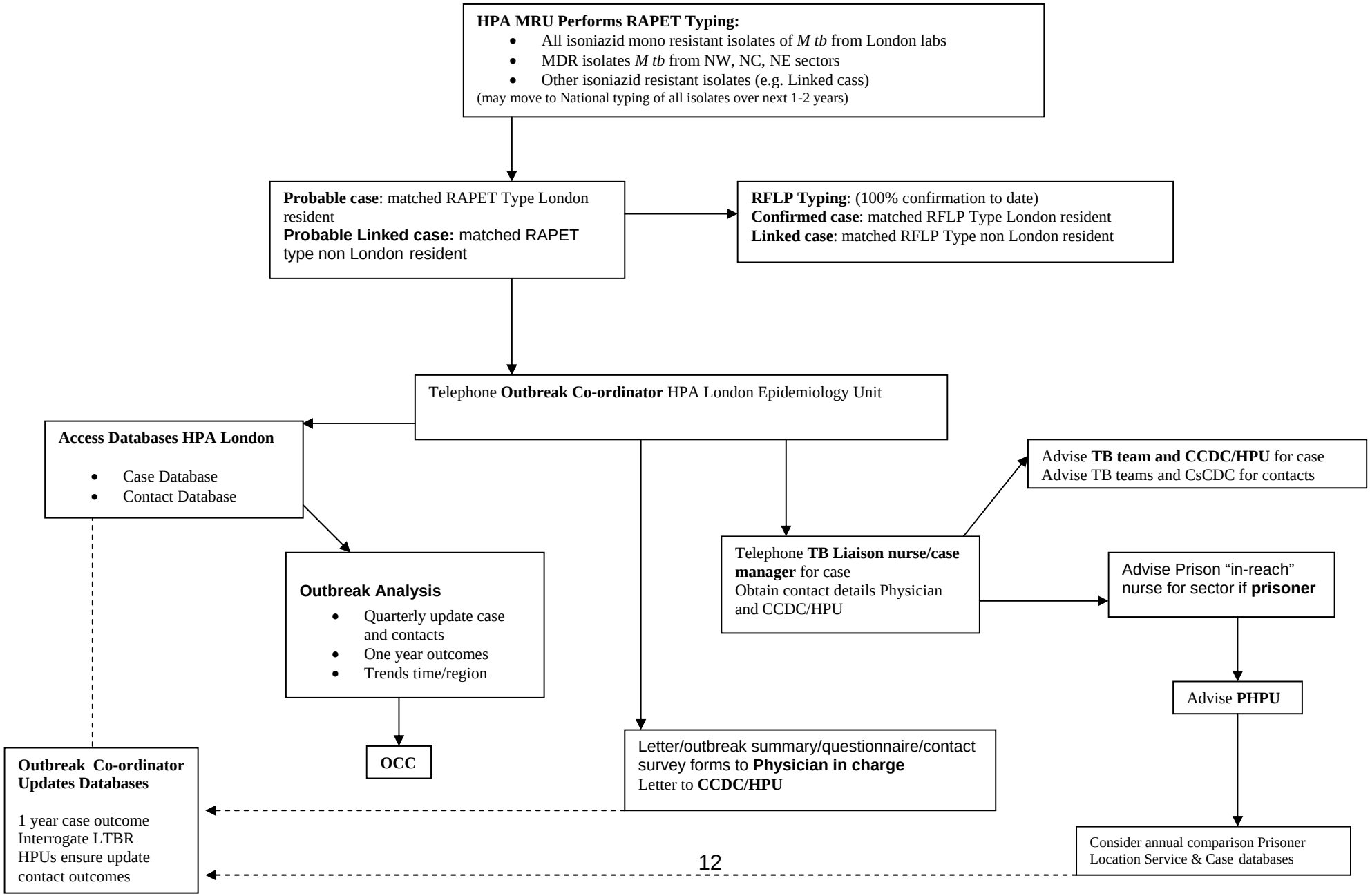

Table R2: Treatment and control measures

Recommendation	Action	Rationale	Responsibility	Comments
CONTROL MEASURES				
TREATMENT				
Appropriate treatment for INR TB	Prolonged treatment as in BTS guidelines (Thorax 1998;**53:** 544)	Extended treatment/drug regimens where INH-R to reduce relapse, emergence MDR-TB	Trust TB teams	
	Information pack sent to local TB teams to advise about control measures	Ensure teams aware of links to INR-TB incident and likely need extended control measures	HPA-London (Helen Maguire) HPA-HPUs (CsCDC)	
Community cases: Improve treatment completion using DOT and a case management approach with support, incentives and sanctions **This is a 'Step down' rather than 'Step up' approach**	Use DOT in those patients who: • Are at-risk of poor adherence (BTS criteria) • Are part of INH-R incident unless the clinician confident good adherence & has demonstrated this DOT does not have to be provided by a TB nurse or physician	Treatment completion is essential to control the incident. Treatment completion in this incident is below 50% Poor treatment adherence increases the risk of adverse outcomes (MDR-TB, increased morbidity and mortality) Many of the cases have risk factors and documented poor adherence. Adherence can be improved by implementing social and housing support and incentives, as well as health service measures such as free or supervised treatment	TB network managers, with: • TB clinical teams • TB case managers • HPA-HPUs (CsCDC) • HPA-London (LTBR) • PCTs • Local authorities • Voluntary sector	Will require action from NHS and non-NHS organisations The BTS guidelines recommend DOT in: • Homeless • Alcohol or drug misusers • 'Drifters' • Serious mental illness • MDR-TB • Past or present history of poor adherence
Continued overleaf				

Recommendation	Action	Rationale	Responsibility	Comments
Continued from previous page	Develop framework for hierarchy of support and sanctions if DOT is failing Measures include: • Incentives • Provision of housing • Follow-up non-attenders • Detention under PH Act	Support, incentives, stable environment improve adherence and treatment completion	TB network managers, with agencies listed above	Supporting People Strategy (Office Deputy Prime Minister) for vulnerable adults Report on secure accommodation has been sent to commissioners: London Regional PH Group and SHA Directors of PH Detention under PH act does not extend to power to treat
	Free treatment	Improves adherence and treatment completion	TB clinical teams Trust pharmacists PCTs	North Central London has identified a mechanism by which free treatment can be given to all patients
	Withdrawal of treatment	Intermittent incomplete treatment increases risk of MDR-TB MDR-TB is complex to manage, and presents a serious public health risk	TB physician CCDC Legal opinion may be needed	Consult John Moore Gillon has reviewed ethics of treatment withdrawal

Recommendation	Action	Rationale	Responsibility	Comments
Prison cases: Improve adherence and treatment completion	DOT for all prisoners	Improve treatment adherence	Prison staff Prison healthcare teams Prison liaison nurse Community TB team	Community TB staff and CCDC involved in awareness raising and education
	Communication with community teams on discharge	Treatment completion to reduce drug resistance emerging	Prison staff Prison healthcare teams Prison liaison nurse Community TB team	Discharge/transfer checklists have been developed for staff to use for prisoners with TB to ensure communication with community teams and local CCDC – contact Ruth Gilbert TB in prison surveillance unit CDSC Colindale
Prisons: Reduce transmission	Do not transfer prisoners with infectious pulmonary TB and prison health care staff explain to prison operational staff why not	Delay transfer until non-infectious, usually two weeks after treatment starts If transfer unavoidable, urgently notify receiving prison	London prisons: PCTs Community-prison liaison TB clinical teams Prison TB health care Prisons outside London: Prison health (Mary Piper)	
Prisons: Ensure treatment continuity for prisoners transferred or released	Inform receiving prisons of diagnosis of TB and TB treatment plan when transferred Discharge/transfer checklist should be used for all prisoners with TB to ensure correct protocols are followed	As for treatment completion, above	TB healthcare teams Community and prison liaison nurses HPA-HPUs (CsCDC)	Need to agree protocols for communication and follow up with prisons
Continued overleaf				

Recommendation	Action	Rationale	Responsibility	Comments
Continued from previous page	Inform local TB teams when prisoner released from prison Arrange clinical follow-up, housing and other support in advance of release	As for treatment completion, above Increase in methadone may be needed due to enzyme induction by anti-tuberculosis drugs	Community and prison liaison nurses TB clinical teams TB network managers PCTs Community Drug Teams	
Improve links with NHS and non-NHS agencies involved in the management of cases and at-risk contacts	Provide specific information on treatment of those on methadone maintenance with anti-TB medication Measures for raising awareness of TB are described in Table R1	Appropriate treatment of cases and contacts	TB network managers TB clinical teams Prison healthcare teams	.
Monitor outcomes for BOTH treatment adherence and completion	Monitor: Treatment completion at 12 months Numbers /proportions on DOT Adverse outcomes, e.g. Failure to attend for treatment/ loss to follow-up Drug resistance/ MDR-TB Deaths	Identify gaps and risks in incident management	HPA London & integration with LTBR TB teams HPA-HPUs (CsCDC)	Identify additional measures required to ensure outcome data complete Integrate incident database with LTBR (Table R4) Consider qualitative care pathway analysis in addition to quantitative analysis outcomes

Table R3: Contact Tracing

Recommendation	Action	Rationale	Responsibility	Comments
CONTACT TRACING				
Tracing and treatment close contacts, including close social and work contacts	Recommendations for contact tracing in this incident sent to local TB teams and CsCDC when case identified	Prevention secondary cases and onward transmission TB. BTS guidelines recommend: "*Consider lifestyle of index and/or source case carefully to reveal places of close contact other than domestic or occupational such as homeless shelters, cinemas, bars, clubs or aircraft*" BTS guidelines define close contacts as: People from same household sharing kitchen facilities and very close associates such as boyfriend/girlfriend or frequent visitors to the home of the index case	TB teams HPA-HPUs (CsCDC) Prisons: Community prison liaison Prison-community liaison nurses Prison TB healthcare worker HPA-London: information pack	For further discussion at OCC meeting December 2004
Treatment of contacts with active TB or TB infection	BTS guidelines			
OTHER MEASURES TO REDUCE TRANSMISSION				
Implement BTS guidelines for management TB in hospitals	Identify gaps and risks for TB management in London Hospital Trusts	Evidence of hospital acquired infection in 4 cases (3 were staff)	Trust TB teams Hospital infection control teams SHAs	

Recommendation	Action	Rationale	Responsibility	Comments
Ensure adequate resources available in hospital for TB management e.g. negative pressure rooms	Review capacity for TB management in London trusts and agree plan to address deficiencies	Reduce risk of TB transmission in health care settings	TB clinical teams PCTs TB network managers SHAs	

Table R4: Monitoring and co-ordination of incident

Recommendation	Action	Rationale	Responsibility	Comments
MONITORING & CO-ORDINATION OF INCIDENT				
Maintain up-to-date incident database	Review and clarify pathways for data collection, storage and analysis Clarify links with LTBR	Database for both: Descriptive epidemiological monitoring of incident Provide timely information to guide clinical and public health management	HPA- London – Helen Maguire together with HPA TB leads in HPUs HPA MRU: Case reporting LTBR :Jacqui Carless, outcome information TB network managers TB clinical teams: clinical and contact information	Transfer of responsibility from Michael Ruddy and Angharad Davies to HPA-London Sarah Forrester by June 2004.
Maintain up-to-date incident contacts database	Subgroup now reviewing results of contact studies. Further action for contact database to be discussed at OCC meeting December 2004			
Timely reporting of incident progress and adverse outcomes	Regular quarterly incident updates, Ad hoc communications as appropriate	Identify gaps and risks in clinical and incident management to guide future incident management	HPA London – Helen Maguire TB clinical teams HPA-HPUs: CsCDC	Clarify lines of communication
	Regular more detailed reporting of incident progress and control, usually once a year	Monitor incident progress and update recommendations and priorities for incident control	OCC HPA-London: co-ordination and dissemination of report	
Continue regular OCC meetings	Meetings twice a year to monitor outbreak	Monitor incident progress Review and agree control measures	HPA-London: Organisation and co-ordination OCC	

Recommendation	Action	Rationale	Responsibility	Comments
Annual statistical analysis and modelling of incident	Statistical modelling of incident	Current/historical microbiological and clinical data may underestimate size of incident and be misleading for subsiding cases	HPA Colindale Statisticians (Andre Charlett) OCC	December 2004 (Last done June 2004)
COMMUNICATION				
Regular and ad hoc communications on incident progress, recommendations and priorities for control and adverse outcomes	Outlined above in Sections on diagnosis, treatment and contact tracing	Monitor incident progress and control	Above	
Communication with prisons	Communication will be both ad hoc as necessary for incident control and by regular reports on incident progress Use two communication systems: 1. Prison Health 2. HPA/HPU chains of communication	Maintain awareness of incident progress, specifically those issues relating to prisons Recommendations and priorities for incident control Contribute to knowledge base for TB management in prisons and hard-to-reach populations	London prisons: Prison liaison nurse Other prisons: Prison surveillance unit HPA-Colindale Prison Health Policy Unit, Senior PH Advisor (Mary Piper) HPA Regional Units in rest of England London HPA-HPUs, SHAs	

Continued overleaf

Recommendation	Action	Rationale	Responsibility	Comments
Communication with other regional and national bodies and healthcare professionals nationally	CDR weekly Press releases	Incident monitoring and control Raise awareness of incident nationally	HPA-London TB Surveillance Unit, HPA-Colindale Individual members OCC	
General communications and as necessary for management of incident	Briefings London regional office and Department of Health Reports and publications in peer-reviewed journals	Potential to increase identification of new cases outside London region Some control measures require action at regional or national level Lessons from incident have wider implications for general TB control in London and nationally Opportunity for critical review		
ADMINISTRATION	Co-ordination of OCC meetings, record-keeping, circulation of minutes and other documents		HPA-London	

ABBREVIATIONS

CCDC	Consultant Communicable Disease Control
CDSC	Communicable Disease Surveillance Centre (now part of HPA)
DH	Department of Health
DOT	Directly observed therapy
DPH	Director of Public Health
HCW	Health care worker
HPA	Health Protection Agency
HPU	Health Protection Unit
INH-R	Isoniazid resistant
IVDU	Intravenous drug user
LA	Local authority
MDR	Multi-drug resistant
MOU	Memorandum of understanding
MRU	Mycobacterium Reference Unit
NMUH	North Middlesex University Hospital NHS Trust
OCC	Outbreak Control Committee
PCT	Primary Care Trust
PHLS	Public Health Laboratory Service
PHLS	Public Health Laboratory Service (now part of HPA)
PHPU	Prison Health Policy Unit
RAPET	Rapid epidemiological test
RE	Regional Epidemiologist
RFLP	Restriction length fragment polymorphism
SHA	Strategic Health Authority
SLA	Service level agreement
SpR	Specialist Registrar
ToR	Terms of Reference

OUTBREAK CONTROL COMMITTEE MEMBERSHIP

Current members

Dr Sheila	Adam	DPH, NE London SHA Chair OCC from June 2004
Ms Lynn	Altass	TB Network Co-ordinator, North Central
Dr Helen	Booth	Chest Physician and TB Clinical Lead North Central
Dr Graham	Bothamley	Chest Physician, Homerton. TB clinical lead, NE London sector.
Ms Jacqui	Carless	Information Officer LTBR, HPA London
Dr Ann	Connolly	DPH Haringey PCT .
Marie		Member of TB network and TB Strategic Group, NC London sector.
Dr Angharad	Davies	SpR Microbiology Royal Free NHS Trust (& North Middlesex University Hospital NHS Trust)
Dr Yasmin	Drabu	Medical Director & Consultant Microbiologist, North Middlesex University Hospital NHS Trust
Prof Francis	Drobniewski	Director & Consultant Microbiologist HPA MRU - expert input related cases
Dr Edward	James	Consultant Microbiologist, Barnet and Chase Farm Hospitals NHS Trust
Dr Jane	Jones	Consultant Epidemiologist, HPA Colindale.
Dr Marc	Lipman	Consultant Chest Physician, Royal Free NHS Trust
Dr Stefan	Lozewicz	Consultant Chest Physician, North Middlesex University Hospital NHS Trust
Dr Helen	Maguire	Regional Epidemiologist, HPA London. Chair OCC 2001 -2004
Dr Bharat	Patel	HPA Consultant Microbiologist, NC London sector and North Middlesex University Hospital NHS Trust
Dr Mary	Piper	Consultant Prison Health Policy Unit, DH
Mr Robert	Roots	TB co-ordinator, NE London sector
Dr Michael	Ruddy	SpR Microbiology, HPA MRU (and North Middlesex University Hospital NHS Trust)
Dr Ruth	Ruggles	SpR Public Health, HPA London (until 04/2004)
Dr Peter	Sheridan	CCDC, HPA Enfield & Haringey. TB lead, HPA NC London sector.
Mr Alistair	Story	Nurse Scientist and Epidemiologist, HPA Colindale
Ms Kerri	Viney	TB liaison nurse, Homerton
Dr John	Watson	Consultant Epidemiologist, HPA Colindale. National TB expert.
Ms Gladys	Xavier	Nurse Consultant, TB Lead HPA NE London.
Mr Malcolm	Yates	Principal Microbiologist HPA MRU - expert input related cases
Ms Sue	Yates	TB Nurse North Middlesex University Hospital NHS Trust

Past OCC members

Dr Madan	Bahl	Retired CCDC, HPA Camden & Islington
Dr Sooria	Balasegaram	SpR Public Health, HPA London
Dr Georgia	Duckworth	Consultant Epidemiologist, HPA Colindale
Ms Jo	Herbert	HPA-Colindale
Dr Ann	Mier	Barnet and Chase Farm Hospitals, NHS Trust
Dr Fiona	Neely	SpR Public Health, HPA London
Dr Sheba	Sen	Retired CCDC, Barnet, Enfield and Haringey