TB Service Delivery: Appendices

April 2015

Table of Contents

Appendix 1 Search strategies 3
Appendix 2 Screening criteria 32
High level sift criteria – title only stage 32
Second level sift criteria – title and abstract stage 33
Full text screening criteria stage 34
Appendix 3 Additional case study material 35
Non-UK service models 35
UK service models 37
London model 37
Appendix 4 Data extraction sheets for effectiveness review (31 studies) 38
UK National (5 studies) 38
Backx 2011 38
Bothamley 2011 41
Cullen 2012 43
Panchal 2012 45
Van Hest 2008 47
UK London (9 studies) 49
Aldridge 2014 49
Anderson 2014 51
Bothamley 2007 53
Griffiths 2007 55
Hall 2010 57
Hayward, 2010 59
Jit 2011 61
London Health Programmes 2011 63
Story 2009 65
UK Non-London urban (5 studies) 67
Browne 2013 67
King 2009 69
Lynch 2013 71
Monk 2014 73
Verma 2011 75
UK Rural (1 study) 77
Abubakar 2006 77
UK Prison (1 study) 79
Ahmed 2007 79
New York City (5 studies) 81
Anger 2007 81
Munsniff 2006a 83
Munsniff 2006b 86
Pursnami 2014 89
Udeagu 2007 91
Netherlands (2 studies) 93
De Vries 2007 93
Lamberts-van Weezenbeek 2003 95
Canada (2 studies) 97
Richards 2005 97
Tian 2013 99
Barcelona (1 study) 101
Ospina 2013 101

Appendix 1 Search strategies

Database: ASSIA
Host: ProQuest
Data Parameters: no restrictions
Date Searched: 02 April 2014
Searcher: PL
QA: TH
Strategy:

Set#	Searched for	Results
S1	SU.EXACT.EXPLODE("Tuberculosis")	712°
S2	ti(tuberculosis or TB) or ab(tuberculosis or TB)	979°
S3	s1 or s2	1014°
S4	SU.EXACT("Health needs") OR SU.EXACT("Health boards") OR SU.EXACT("Health maintenance organizations") OR SU.EXACT("Health costs") OR SU.EXACT("Health authorities") OR SU.EXACT("Health policy") OR SU.EXACT("Health services")	7146*
S5	SU.EXACT("Organizational factors") OR SU.EXACT("Organizational networks") OR SU.EXACT("Organizational theories") OR SU.EXACT("Organizational support") OR SU.EXACT("Organizational audits") OR SU.EXACT("Organizational models") OR SU.EXACT("Organizational culture") OR SU.EXACT("Organizational development") OR SU.EXACT("Organizational behaviour") OR SU.EXACT("Organizational power") OR SU.EXACT("Organizational control") OR SU.EXACT("Organizational status") OR SU.EXACT("Organizational effectiveness") OR SU.EXACT("Organizational surveys") OR SU.EXACT("Organizational commitment") OR SU.EXACT("Organizational structure") OR SU.EXACT("Organizational policy") OR SU.EXACT("Organizational performance")	2736°
S6	SU.EXACT.EXPLODE("Commissioning" OR "Joint commissioning" OR "Local commissioning")	222°
S7	SU.EXACT("Commissioners") OR SU.EXACT("Commissioning")	274°
S8	SU.EXACT("Delivery method") OR SU.EXACT("Delivery services")	26°
S9	SU.EXACT("Service provision") OR SU.EXACT("Service delivery") OR SU.EXACT("Service integration") OR SU.EXACT("Service distribution") OR SU.EXACT("Services") OR SU.EXACT("Community health services")	4555*
S10	SU.EXACT("Financial management") OR SU.EXACT("Public health policy") OR SU.EXACT("Public health agencies") OR SU.EXACT("Resource allocation") OR SU.EXACT("Decision making") OR SU.EXACT("Capacity building approach") OR SU.EXACT("Regional health services") OR SU.EXACT("Centralization")	7929*
S11	s4 or s5 or s6 or s7 or s8 or s9 or s10	21851*
S12	s3 and s11	65°
S13	ti((service* or program* or system* or resource* or intervention* or scheme*) near/4 (commission* or provid* or provision* or toolkit* or planning or planner* or deliver* or ratio or ratios or implement* or audit* or survey* or mechanism* or referral* or integrat* or requirement* or utilis* or utiliz* or reorganis* or reorganiz* or organis* or organiz* or manage* or centralis* or centraliz* or coordinat* or decentrali* or devolv* or devolution* or framework* or capacity or capacities or collaborat* or pathway* or structur* or model* or evaluat* or configur* or access* or contract* or develop* or need or needs or network* or agency or agencies or component* or district* or strateg* or determinant* or priorit* or leverage* or dedicat* or workload* or policy or policies or process* or protocol*))	13795*
S14	ab((service* or program* or system* or resource* or intervention* or scheme*)	80990*

	near/4 (commission* or provid* or provision* or toolkit* or planning or planner* or deliver* or ratio or ratios or implement* or audit* or survey* or mechanism* or referral* or integrat* or requirement* or utilis* or utiliz* or reorganis* or reorganiz* or organis* or organiz* or manage* or centralis* or centraliz* or coordinat* or decentrali* or devolv* or devolution* or framework* or capacity or capacities or collaborat* or pathway* or structur* or model* or evaluat* or configur* or access* or contract* or develop* or need or needs or network* or agency or agencies or component* or district* or strateg* or determinant* or priorit* or leverage* or dedicat* or workload* or policy or policies or process* or protocol*))	
S15	ti(((contact* near/3 trac*) or diagnos* or treat*) near/4 (deliver* or commission* or provid* or provision* or organis* or organiz* or model* or pathway* or planning or planner* or ratio or ratios or audit* or coordinat* or strateg* or reorganis* or reorganiz* or centralis* or centraliz* or decentrali* or structur*))	907°
S16	ab(((contact* near/3 trac*) or diagnos* or treat*) near/4 (deliver* or commission* or provid* or provision* or organis* or organiz* or model* or pathway* or planning or planner* or ratio or ratios or audit* or coordinat* or strateg* or reorganis* or reorganiz* or centralis* or centraliz* or decentrali* or structur*))	8358*
S17	s13 or s14 or s15 or s16	91353*
S18	s3 and s17	286°
S19	ti(service* or program* or system* or resource* or intervention* or scheme*) or ab(service* or program* or system* or resource* or intervention* or scheme*)	196850*
S20	s3 and s19	499°
S21	SU.EXACT("Netherlands") OR SU.EXACT("Spain") OR SU.EXACT("Canada")	12255*
S22	SU.EXACT.EXPLODE("Channel Islands" OR "England" OR "England and Wales" OR "Guernsey" OR "Jersey" OR "Northern England" OR "Northern Ireland" OR "Scotland" OR "Southern England" OR "UK" OR "Wales")	67551*
S23	ti(new york* or nyc) OR ab(new york* or nyc)	3488°
S24	ti(spain* or spanish or catalan* or catalonia* or barcelona*) OR ab(spain* or spanish or catalan* or catalonia* or barcelona*)	3263°
S25	ti(netherlands or dutch or holland* or amsterdam* or rotterdam* or utrecht* or eindhoven* or hague* or den haag*) OR ab(netherlands or dutch or holland* or amsterdam* or rotterdam* or utrecht* or eindhoven* or hague* or den haag*)	6126*
S26	ti(canada* or canadian* or ontario* or quebec* or nova scotia* or new brunswick* or manitoba* or british columbia* or prince edward island* or saskatchewan* or alberta* or newfoundland* or yukon* or nunavut* or toronto* or montreal* or halifax* or winnipeg* or vancouver* or charlottetown* or saskatoon* or calgary*) OR ab(canada* or canadian* or ontario* or quebec* or nova scotia* or new brunswick* or manitoba* or british columbia* or prince edward island* or saskatchewan* or alberta* or newfoundland* or yukon* or nunavut* or toronto* or montreal* or halifax* or winnipeg* or vancouver* or charlottetown* or saskatoon* or calgary*)	11178*
S27	ti(britain* or "united kingdom*" or uk or england* or northern ireland* or wales* or scotland* or british or english or scottish or welsh or northern irish or london* or birmingham* or leeds* or glasgow* or sheffield* or edinburgh* or liverpool* or manchester* or bristol* or belfast* or cardiff* or nottingham* or newcastle*) OR ab(britain* or "united kingdom*" or uk or england* or northern ireland* or wales* or scotland* or british or english or scottish or welsh or northern irish or london* or birmingham* or leeds* or glasgow* or sheffield* or edinburgh* or liverpool* or manchester* or bristol* or belfast* or cardiff* or nottingham* or newcastle*)	54065*
S28	s20 and s21	2°
S29	s20 and s22	30°
S30	s20 and s23	17°
S31	s20 and s24	2°

S32	s20 and s25	0°
S33	s20 and s26	6°
S34	s20 and s27	49°
S35	s28 or s29 or s30 or s31 or s32 or s33 or s34	80°
S36	(s3 and s11) AND pd(20030101-20141231)	51°
S37	(s3 and s17) AND pd(20030101-20141231)	201°
S38	(s28 or s29 or s30 or s31 or s32 or s33 or s34) AND pd(20030101-20141231)	41°

The ProQuest platform would not combine s36, s37 s38 and kept giving an error message. Went into the results page for s36, s37 s38 separately and used “Select all”. Then downloaded all items in the “selected items” list n=238.

Database: CEA Registry
Host: https://research.tufts-nemc.org/cear4/
Data Parameters: none
Date Searched: 25 March 2014
Searcher: PL
QA: TH
Strategy:

Search for tuberculosis n=32
Search for TB n=60

Unable to do sophisticated searches so decided to manually look through all results.
No bulk download so only added to RefMan if post 2003, case study country, non-animals, in English and also relevant to scope.

Database: Cochrane Central Register of Controlled Trials (CENTRAL)
Host: Wiley
Data Parameters: Cochrane Central Register of Controlled Trials: Issue 3 of 12, March 2014
Date Searched: 1 April 2014
Searcher: PL
QA: TH
Strategy:

Date Run: 01/04/14 15:11:20.304

#1 [mh tuberculosis] 1655
#2 (Tuberculosis or TB):ti,ab,kw 3286
#3 #1 or #2 3294
#4 Any MeSH descriptor with qualifier(s): [Organization & administration - OG] 5332
#5 [mh "Delivery of Health Care"] 36095
#6 [mh "Program Evaluation"] 4699
#7 [mh "Delivery of Health Care, Integrated"] 241
#8 [mh "Health Services Administration"] 130810
#9 [mh "Models, Organizational"] 200
#10 [mh "National Health Programs"] 767
#11 [mh "Program Development"] 545
#12 [mh "Patient Care Planning"] 1403
#13 [mh "health planning"] 3451
#14 [mh "Health Planning Organizations"] 13
#15 [mh "Centralized Hospital Services"] 7
#16 [mh "Health Services Needs and Demand"] 407
#17 [mh "financial management"] 270
#18 [mh "state medicine"] 434
#19 [mh "Multi-Institutional Systems"] 22
#20 [mh "planning techniques"] 35
#21 [mh "Public Health Administration"] 31
#22 [mh "resource allocation"] 139
#23 [mh "Decision Making, Organizational"] 57
#24 [mh "Organizational Objectives"] 46
#25 [mh "capacity building"] 11
#26 [mh "Organizational Policy"] 82
#27 [mh "regional health planning"] 267
#28 [mh "Community Health Planning"] 55
#29 [mh "Health Facility Planning"] 2
#30 [mh "Referral and Consultation"] 1797
#31 {or #4-#30} 143887
#32 #3 and #31 642
#33 ((tuberculosis or tb) near/4 (service* or program* or system* or resource* or intervention* or scheme*) near/4 (commission* or provid* or provision* or toolkit* or planning or planner* or deliver* or ratio or ratios or implement* or audit* or survey* or mechanism* or referral* or integrat* or requirement* or utilis* or utiliz* or reorganis* or reorganiz* or organis* or organiz* or manage* or centralis* or centraliz* or coordinat* or decentrali* or devolv* or devolution* or framework* or capacity or capacities or collaborat* or pathway* or structur* or model* or evaluat* or configur* or access* or contract* or develop* or need or needs or network* or agency or agencies or component* or district* or strateg* or determinant* or priorit* or leverage* or dedicat* or workload* or policy or policies or process* or protocol*)):ti,ab 79
#34 ((tuberculosis or tb) near/4 ((contact* near/3 trac*) or diagnos* or treat*) near/4 (deliver* or commission* or provid* or provision* or organis* or organiz* or model* or pathway* or planning or planner* or ratio or ratios or audit* or coordinat* or strateg* or reorganis* or reorganiz* or centralis* or centraliz* or decentrali* or structur*)):ti,ab 48
#35 {or #32-#34} 713
#36 (service* or program* or system* or resource* or intervention* or scheme*):ti,ab 183964
#37 #3 and #36 786
#38 [mh "new York"] 704
#39 [mh "new york city"] 352

#40 [mh Netherlands] 2312
#41 [mh Spain] 1001
#42 [mh Canada] 2965
#43 [mh "great Britain"] 5378
#44 (new york* or nyc):ti,ab 2825
#45 (spain* or spanish or catalan* or catalonia* or barcelona*):ti,ab 4523
#46 (netherlands or dutch or holland* or amsterdam* or rotterdam* or utrecht* or eindhoven* or hague* or den haag*):ti,ab 34982
#47 (canada* or canadian* or ontario* or quebec* or nova scotia* or new brunswick* or manitoba* or british columbia* or prince edward island* or saskatchewan* or alberta* or newfoundland* or yukon* or nunavut* or toronto* or montreal* or halifax* or winnipeg* or vancouver* or charlottetown* or saskatoon* or calgary*):ti,ab 8881
#48 (britain* or "united kingdom*" or uk or england* or northern ireland* or wales* or scotland* or british or english or scottish or welsh or northern irish or london* or birmingham* or leeds* or glasgow* or sheffield* or edinburgh* or liverpool* or manchester* or bristol* or belfast* or cardiff* or nottingham* or newcastle*):ti,ab 18719
#49 {or #38-#48} 74422
#50 #37 and #49 112
#51 #35 or #50 802
#52 #35 or #50 Publication Date from 2003 to 2014 562
#53 [mh animals] not [mh humans] 5643
#54 (cow or cows or cattle or bovine or calves or badger or badgers or hedgehog or hedgehogs or mice or mouse or rat or rats):ti,ab 6065
#55 #53 or #54 10162
#56 #52 not #55 555

Cochrane CENTRAL 381
Cochrane CDSR 17
Cochrane DARE 67
Cochrane NHS EED 79

Database: Cochrane Database of Systematic Reviews (CDSR)
Host: Wiley
Data Parameters: Cochrane Database of Systematic Reviews: Issue 4 of 12, April 2014
Date Searched: 1 April 2014
Searcher: PL
QA: TH
Strategy:
Date Run: 01/04/14 15:11:20.304

#1 [mh tuberculosis] 1655
#2 (Tuberculosis or TB):ti,ab,kw 3286
#3 #1 or #2 3294
#4 Any MeSH descriptor with qualifier(s): [Organization & administration - OG] 5332
#5 [mh "Delivery of Health Care"] 36095
#6 [mh "Program Evaluation"] 4699
#7 [mh "Delivery of Health Care, Integrated"] 241
#8 [mh "Health Services Administration"] 130810
#9 [mh "Models, Organizational"] 200
#10 [mh "National Health Programs"] 767
#11 [mh "Program Development"] 545
#12 [mh "Patient Care Planning"] 1403
#13 [mh "health planning"] 3451
#14 [mh "Health Planning Organizations"] 13
#15 [mh "Centralized Hospital Services"] 7
#16 [mh "Health Services Needs and Demand"] 407
#17 [mh "financial management"] 270
#18 [mh "state medicine"] 434
#19 [mh "Multi-Institutional Systems"] 22
#20 [mh "planning techniques"] 35
#21 [mh "Public Health Administration"] 31
#22 [mh "resource allocation"] 139
#23 [mh " Decision Making, Organizational"] 57
#24 [mh "Organizational Objectives"] 46
#25 [mh "capacity building"] 11
#26 [mh "Organizational Policy"] 82
#27 [mh "regional health planning"] 267
#28 [mh "Community Health Planning"] 55
#29 [mh "Health Facility Planning"] 2
#30 [mh "Referral and Consultation"] 1797
#31 {or #4-#30} 143887
#32 #3 and #31 642
#33 ((tuberculosis or tb) near/4 (service* or program* or system* or resource* or intervention* or scheme*) near/4 (commission* or provid* or provision* or toolkit* or planning or planner* or deliver* or ratio or ratios or implement* or audit* or survey* or mechanism* or referral* or integrat* or requirement* or utilis* or utiliz* or reorganis* or reorganiz* or organis* or organiz* or manage* or centralis* or centraliz* or coordinat* or decentrali* or devolv* or devolution* or framework* or capacity or capacities or collaborat* or pathway* or structur* or model* or evaluat* or configur* or access* or contract* or develop* or need or needs or network* or agency or agencies or component* or district* or strateg* or determinant* or priorit* or leverage* or dedicat* or workload* or policy or policies or process* or protocol*)):ti,ab 79
#34 ((tuberculosis or tb) near/4 ((contact* near/3 trac*) or diagnos* or treat*) near/4 (deliver* or commission* or provid* or provision* or organis* or organiz* or model* or pathway* or planning or planner* or ratio or ratios or audit* or coordinat* or strateg* or reorganis* or reorganiz* or centralis* or centraliz* or decentrali* or structur*)):ti,ab 48
#35 {or #32-#34} 713
#36 (service* or program* or system* or resource* or intervention* or scheme*):ti,ab 183964
#37 #3 and #36 786
#38 [mh "new York"] 704
#39 [mh "new york city"] 352
#40 [mh Netherlands] 2312

#41 [mh Spain] 1001
#42 [mh Canada] 2965
#43 [mh "great Britain"] 5378
#44 (new york* or nyc):ti,ab 2825
#45 (spain* or spanish or catalan* or catalonia* or barcelona*):ti,ab 4523
#46 (netherlands or dutch or holland* or amsterdam* or rotterdam* or utrecht* or eindhoven* or hague* or den haag*):ti,ab 34982
#47 (canada* or canadian* or ontario* or quebec* or nova scotia* or new brunswick* or manitoba* or british columbia* or prince edward island* or saskatchewan* or alberta* or newfoundland* or yukon* or nunavut* or toronto* or montreal* or halifax* or winnipeg* or vancouver* or charlottetown* or saskatoon* or calgary*):ti,ab 8881
#48 (britain* or "united kingdom*" or uk or england* or northern ireland* or wales* or scotland* or british or english or scottish or welsh or northern irish or london* or birmingham* or leeds* or glasgow* or sheffield* or edinburgh* or liverpool* or manchester* or bristol* or belfast* or cardiff* or nottingham* or newcastle*):ti,ab 18719
#49 {or #38-#48} 74422
#50 #37 and #49 112
#51 #35 or #50 802
#52 #35 or #50 Publication Date from 2003 to 2014 562
#53 [mh animals] not [mh humans] 5643
#54 (cow or cows or cattle or bovine or calves or badger or badgers or hedgehog or hedgehogs or mice or mouse or rat or rats):ti,ab 6065
#55 #53 or #54 10162
#56 #52 not #55 555

Cochrane CENTRAL 381
Cochrane CDSR 17
Cochrane DARE 67
Cochrane NHS EED 79

Database: Cochrane Database of Abstracts of Reviews of Effects (DARE)
Host: Wiley
Data Parameters: Database of Abstracts of Reviews of Effects: Issue 1 of 4, January 2014
Date Searched: 1 April 2014
Searcher: PL
QA: TH
Strategy:
Date Run: 01/04/14 15:11:20.304

#1 [mh tuberculosis] 1655
#2 (Tuberculosis or TB):ti,ab,kw 3286
#3 #1 or #2 3294
#4 Any MeSH descriptor with qualifier(s): [Organization & administration - OG] 5332
#5 [mh "Delivery of Health Care"] 36095
#6 [mh "Program Evaluation"] 4699
#7 [mh "Delivery of Health Care, Integrated"] 241
#8 [mh "Health Services Administration"] 130810
#9 [mh "Models, Organizational"] 200
#10 [mh "National Health Programs"] 767
#11 [mh "Program Development"] 545
#12 [mh "Patient Care Planning"] 1403
#13 [mh "health planning"] 3451
#14 [mh "Health Planning Organizations"] 13
#15 [mh "Centralized Hospital Services"] 7
#16 [mh "Health Services Needs and Demand"] 407
#17 [mh "financial management"] 270
#18 [mh "state medicine"] 434
#19 [mh "Multi-Institutional Systems"] 22
#20 [mh "planning techniques"] 35
#21 [mh "Public Health Administration"] 31
#22 [mh "resource allocation"] 139
#23 [mh " Decision Making, Organizational"] 57
#24 [mh "Organizational Objectives"] 46
#25 [mh "capacity building"] 11
#26 [mh "Organizational Policy"] 82
#27 [mh "regional health planning"] 267
#28 [mh "Community Health Planning"] 55
#29 [mh "Health Facility Planning"] 2
#30 [mh "Referral and Consultation"] 1797
#31 {or #4-#30} 143887
#32 #3 and #31 642
#33 ((tuberculosis or tb) near/4 (service* or program* or system* or resource* or intervention* or scheme*) near/4 (commission* or provid* or provision* or toolkit* or planning or planner* or deliver* or ratio or ratios or implement* or audit* or survey* or mechanism* or referral* or integrat* or requirement* or utilis* or utiliz* or reorganis* or reorganiz* or organis* or organiz* or manage* or centralis* or centraliz* or coordinat* or decentrali* or devolv* or devolution* or framework* or capacity or capacities or collaborat* or pathway* or structur* or model* or evaluat* or configur* or access* or contract* or develop* or need or needs or network* or agency or agencies or component* or district* or strateg* or determinant* or priorit* or leverage* or dedicat* or workload* or policy or policies or process* or protocol*)):ti,ab 79
#34 ((tuberculosis or tb) near/4 ((contact* near/3 trac*) or diagnos* or treat*) near/4 (deliver* or commission* or provid* or provision* or organis* or organiz* or model* or pathway* or planning or planner* or ratio or ratios or audit* or coordinat* or strateg* or reorganis* or reorganiz* or centralis* or centraliz* or decentrali* or structur*)):ti,ab 48
#35 {or #32-#34} 713
#36 (service* or program* or system* or resource* or intervention* or scheme*):ti,ab 183964
#37 #3 and #36 786
#38 [mh "new York"] 704
#39 [mh "new york city"] 352
#40 [mh Netherlands] 2312

#41 [mh Spain] 1001
#42 [mh Canada] 2965
#43 [mh "great Britain"] 5378
#44 (new york* or nyc):ti,ab 2825
#45 (spain* or spanish or catalan* or catalonia* or barcelona*):ti,ab 4523
#46 (netherlands or dutch or holland* or amsterdam* or rotterdam* or utrecht* or eindhoven* or hague* or den haag*):ti,ab 34982
#47 (canada* or canadian* or ontario* or quebec* or nova scotia* or new brunswick* or manitoba* or british columbia* or prince edward island* or saskatchewan* or alberta* or newfoundland* or yukon* or nunavut* or toronto* or montreal* or halifax* or winnipeg* or vancouver* or charlottetown* or saskatoon* or calgary*):ti,ab 8881
#48 (britain* or "united kingdom*" or uk or england* or northern ireland* or wales* or scotland* or british or english or scottish or welsh or northern irish or london* or birmingham* or leeds* or glasgow* or sheffield* or edinburgh* or liverpool* or manchester* or bristol* or belfast* or cardiff* or nottingham* or newcastle*):ti,ab 18719
#49 {or #38-#48} 74422
#50 #37 and #49 112
#51 #35 or #50 802
#52 #35 or #50 Publication Date from 2003 to 2014 562
#53 [mh animals] not [mh humans] 5643
#54 (cow or cows or cattle or bovine or calves or badger or badgers or hedgehog or hedgehogs or mice or mouse or rat or rats):ti,ab 6065
#55 #53 or #54 10162
#56 #52 not #55 555

Cochrane CENTRAL 381
Cochrane CDSR 17
Cochrane DARE 67
Cochrane NHS EED 79

Database: Cochrane NHS Economic Evaluations Database (NHS EED)
Host: Wiley
Data Parameters: NHS Economic Evaluation Database: Issue 1 of 4, January 2014
Date Searched: 1 April 2014
Searcher: PL
QA: TH
Strategy:
Date Run: 01/04/14 15:11:20.304

#1 [mh tuberculosis] 1655
#2 (Tuberculosis or TB):ti,ab,kw 3286
#3 #1 or #2 3294
#4 Any MeSH descriptor with qualifier(s): [Organization & administration - OG] 5332
#5 [mh "Delivery of Health Care"] 36095
#6 [mh "Program Evaluation"] 4699
#7 [mh "Delivery of Health Care, Integrated"] 241
#8 [mh "Health Services Administration"] 130810
#9 [mh "Models, Organizational"] 200
#10 [mh "National Health Programs"] 767
#11 [mh "Program Development"] 545
#12 [mh "Patient Care Planning"] 1403
#13 [mh "health planning"] 3451
#14 [mh "Health Planning Organizations"] 13
#15 [mh "Centralized Hospital Services"] 7
#16 [mh "Health Services Needs and Demand"] 407
#17 [mh "financial management"] 270
#18 [mh "state medicine"] 434
#19 [mh "Multi-Institutional Systems"] 22
#20 [mh "planning techniques"] 35
#21 [mh "Public Health Administration"] 31
#22 [mh "resource allocation"] 139
#23 [mh " Decision Making, Organizational"] 57
#24 [mh "Organizational Objectives"] 46
#25 [mh "capacity building"] 11
#26 [mh "Organizational Policy"] 82
#27 [mh "regional health planning"] 267
#28 [mh "Community Health Planning"] 55
#29 [mh "Health Facility Planning"] 2
#30 [mh "Referral and Consultation"] 1797
#31 {or #4-#30} 143887
#32 #3 and #31 642
#33 ((tuberculosis or tb) near/4 (service* or program* or system* or resource* or intervention* or scheme*) near/4 (commission* or provid* or provision* or toolkit* or planning or planner* or deliver* or ratio or ratios or implement* or audit* or survey* or mechanism* or referral* or integrat* or requirement* or utilis* or utiliz* or reorganis* or reorganiz* or organis* or organiz* or manage* or centralis* or centraliz* or coordinat* or decentrali* or devolv* or devolution* or framework* or capacity or capacities or collaborat* or pathway* or structur* or model* or evaluat* or configur* or access* or contract* or develop* or need or needs or network* or agency or agencies or component* or district* or strateg* or determinant* or priorit* or leverage* or dedicat* or workload* or policy or policies or process* or protocol*)):ti,ab 79
#34 ((tuberculosis or tb) near/4 ((contact* near/3 trac*) or diagnos* or treat*) near/4 (deliver* or commission* or provid* or provision* or organis* or organiz* or model* or pathway* or planning or planner* or ratio or ratios or audit* or coordinat* or strateg* or reorganis* or reorganiz* or centralis* or centraliz* or decentrali* or structur*)):ti,ab 48
#35 {or #32-#34} 713
#36 (service* or program* or system* or resource* or intervention* or scheme*):ti,ab 183964
#37 #3 and #36 786
#38 [mh "new York"] 704
#39 [mh "new york city"] 352
#40 [mh Netherlands] 2312

#41 [mh Spain] 1001
#42 [mh Canada] 2965
#43 [mh "great Britain"] 5378
#44 (new york* or nyc):ti,ab 2825
#45 (spain* or spanish or catalan* or catalonia* or barcelona*):ti,ab 4523
#46 (netherlands or dutch or holland* or amsterdam* or rotterdam* or utrecht* or eindhoven* or hague* or den haag*):ti,ab 34982
#47 (canada* or canadian* or ontario* or quebec* or nova scotia* or new brunswick* or manitoba* or british columbia* or prince edward island* or saskatchewan* or alberta* or newfoundland* or yukon* or nunavut* or toronto* or montreal* or halifax* or winnipeg* or vancouver* or charlottetown* or saskatoon* or calgary*):ti,ab 8881
#48 (britain* or "united kingdom*" or uk or england* or northern ireland* or wales* or scotland* or british or english or scottish or welsh or northern irish or london* or birmingham* or leeds* or glasgow* or sheffield* or edinburgh* or liverpool* or manchester* or bristol* or belfast* or cardiff* or nottingham* or newcastle*):ti,ab 18719
#49 {or #38-#48} 74422
#50 #37 and #49 112
#51 #35 or #50 802
#52 #35 or #50 Publication Date from 2003 to 2014 562
#53 [mh animals] not [mh humans] 5643
#54 (cow or cows or cattle or bovine or calves or badger or badgers or hedgehog or hedgehogs or mice or mouse or rat or rats):ti,ab 6065
#55 #53 or #54 10162
#56 #52 not #55 555

Cochrane CENTRAL 381
Cochrane CDSR 17
Cochrane DARE 67
Cochrane NHS EED 79

Database: Cumulative Index to Nursing and Allied Health (CINHAL)
Host: HDAS
Data Parameters: no restrictions
Date Searched: 2 April 2014
Searcher: PL
QA: TH
Strategy:
1. CINAHL; (Tuberculosis OR TB).ti,ab; 8094 results.
2. CINAHL; exp TUBERCULOSIS/; 9050 results.
3. CINAHL; 1 OR 2; 10594 results.
4. CINAHL; ORGANIZATIONAL OBJECTIVES/; 11561 results.
5. CINAHL; PROGRAM EVALUATION/ OR EVALUATION AND QUALITY IMPROVEMENT PROGRAM/ OR PROGRAM DEVELOPMENT/; 28846 results.
6. CINAHL; HEALTH CARE DELIVERY/ OR HEALTH CARE DELIVERY, INTEGRATED/ OR HEALTH RESOURCE ALLOCATION/; 31832 results.
7. CINAHL; HEALTH SERVICES ADMINISTRATION/ OR HEALTH SERVICES NEEDS AND DEMAND/; 12508 results.
8. CINAHL; MODELS, STRUCTURAL/; 431 results.
9. CINAHL; NATIONAL HEALTH PROGRAMS/; 38369 results.
10. CINAHL; PROGRAM PLANNING/; 3391 results.
11. CINAHL; HEALTH FACILITY PLANNING/ OR HEALTH AND WELFARE PLANNING/ OR HEALTH SYSTEMS AGENCIES/; 5621 results.
12. CINAHL; FINANCIAL MANAGEMENT/; 8019 results.
13. CINAHL; MULTIINSTITUTIONAL SYSTEMS/; 3129 results.
14. CINAHL; PLANNING TECHNIQUES/; 2684 results.
15. CINAHL; PUBLIC HEALTH ADMINISTRATION/; 3360 results.
16. CINAHL; RESOURCE ALLOCATION/ OR HEALTH RESOURCE UTILIZATION/; 10200 results.
17. CINAHL; DECISION MAKING, ORGANIZATIONAL/ OR DECISION SUPPORT SYSTEMS, MANAGEMENT/; 2445 results.
18. CINAHL; ORGANIZATIONAL POLICIES/; 6968 results.
19. CINAHL; STATE HEALTH PLANS/; 1255 results.
20. CINAHL; REFERRAL AND CONSULTATION/; 16113 results.
21. CINAHL; 4 OR 5 OR 6 OR 7 OR 8 OR 9 OR 10 OR 11 OR 12 OR 13 OR 14 OR 15 OR 16 OR 17 OR 18 OR 19 OR 20; 166004 results.
22. CINAHL; 3 and 21; 588 results.
23. CINAHL; (((((tuberculosis OR tb) adj3 (service* OR program* OR system* OR resource* OR intervention* OR scheme*) adj3 (commission* OR provid* OR provision* OR toolkit* OR planning OR planner* OR deliver* OR ratio OR ratios OR implement* OR audit* OR survey* OR mechanism* OR referral* OR integrat* OR requirement* OR utilis* OR utiliz* OR reorganis* OR reorganiz* OR organis* OR organiz* OR manage* OR centralis* OR centraliz* OR coordinat* OR decentrali* OR devolv* OR devolution* OR framework* OR capacity OR capacities OR collaborat* OR pathway* OR structur* OR model* OR evaluat* OR configur* OR access* OR contract* OR develop* OR need OR needs OR network* OR agency OR agencies OR component* OR district* OR strateg* OR determinant* OR priorit* OR leverage* OR dedicat* OR workload* OR policy OR policies OR process* OR protocol*))))).ti,ab; 189 results.
24. CINAHL; ((((tuberculosis OR tb) adj3 ((contact* adj2 trac*) OR diagnos* OR treat*) adj3 (deliver* OR commission* OR provid* OR provision* OR organis* OR organiz* OR model* OR pathway* OR planning OR planner* OR ratio OR ratios OR audit* OR coordinat* OR strateg* OR reorganis* OR reorganiz* OR centralis* OR centraliz* OR decentrali* OR structur*)))).ti,ab; 74 results.
25. CINAHL; 22 OR 23 OR 24; 776 results.
26. CINAHL; (((service* OR program* OR system* OR resource* OR intervention* OR scheme*))).ti,ab; 526328 results.
27. CINAHL; 3 and 26; 2143 results.
28. CINAHL; NEW YORK/; 17082 results.
29. CINAHL; NETHERLANDS/; 12744 results.
30. CINAHL; SPAIN/; 8656 results.
31. CINAHL; CANADA/; 30803 results.
32. CINAHL; exp GREAT BRITAIN/; 54954 results.
33. CINAHL; ((new york* OR nyc)).ti,ab; 8735 results.
34. CINAHL; ((spain* OR spanish OR catalan* OR catalonia* OR barcelona*)).ti,ab; 15119 results.

35. CINAHL; (netherlands OR dutch OR holland* OR amsterdam* OR rotterdam* OR utrecht* OR eindhoven* OR hague* OR den AND haag*).ti,ab; 8971 results.
36. CINAHL; (canada* OR canadian* OR ontario* OR quebec* OR nova AND scotia* OR new AND brunswick* OR manitoba* OR british AND columbia* OR prince AND edward AND island* OR saskatchewan* OR alberta* OR newfoundland* OR yukon* OR nunavut* OR toronto* OR montreal* OR halifax* OR winnipeg* OR vancouver* OR charlottetown* OR saskatoon* OR calgary*).ti,ab; 31590 results.
37. CINAHL; (britain* OR "united kingdom*" OR uk OR england* OR northern AND ireland* OR wales* OR scotland* OR british OR english OR scottish OR welsh OR northern AND irish OR london* OR birmingham* OR leeds* OR glasgow* OR sheffield* OR edinburgh* OR liverpool* OR manchester* OR bristol* OR belfast* OR cardiff* OR nottingham* OR newcastle*).ti,ab; 84469 results.
38. CINAHL; 28 OR 29 OR 30 OR 31 OR 32 OR 33 OR 34 OR 35 OR 36 OR 37; 215279 results.
39. CINAHL; 27 AND 38; 272 results.
40. CINAHL; 25 OR 39; 993 results.
41. CINAHL; 40 [Limit to: Publication Year 2003-2014]; 681 results.
42. CINAHL; 41 [Limit to: Publication Year 2003-2014 and (Language English)]; 631 results.

Database: EconLit
Host: Ovid
Data Parameters: Econlit 1886 to February 201
Date Searched: 28 March 2014
Searcher: PL
QA: TH
Strategy:

Database(s): **Econlit** 1886 to February 2014 #	**Searches**	**Results**
1	(tuberculosis or tb).ti,ab,sh,kw.	174
2	(((contact$ adj2 trac$) or diagnos$ or treat$) adj3 (deliver$ or commission$ or provid$ or provision$ or organis$ or organiz$ or model$ or pathway$ or planning or planner$ or ratio or ratios or audit$ or coordinat$ or strateg$ or reorganis$ or reorganiz$ or centralis$ or centraliz$ or decentrali$ or structur$)).ti,ab,sh,kw.	1977
3	((service$ or program$ or system$ or resource$ or intervention$ or scheme$) adj3 (commission$ or provid$ or provision$ or toolkit$ or planning or planner$ or deliver$ or ratio or ratios or implement$ or audit$ or survey$ or mechanism$ or referral$ or integrat$ or requirement$ or utilis$ or utiliz$ or reorganis$ or reorganiz$ or organis$ or organiz$ or manage$ or centralis$ or centraliz$ or coordinat$ or decentrali$ or devolv$ or devolution$ or framework$ or capacity or capacities or collaborat$ or pathway$ or structur$ or model$ or evaluat$ or configur$ or access$ or contract$ or develop$ or need or needs or network$ or agency or agencies or component$ or district$ or strateg$ or determinant$ or priorit$ or leverage$ or dedicat$ or workload$ or policy or policies or process$ or protocol$)).ti,ab,sh,kw.	62005
4	2 or 3	63746
5	1 and 4	38
6	((tuberculosis or tb) and (service$ or program$ or system$ or resource$ or intervention$ or scheme$)).ti,ab,sh,kw.	75
7	(new york$ or nyc or spain$ or spanish or catalan$ or catalonia$ or barcelona$ or netherlands or dutch or holland$ or amsterdam$ or rotterdam$ or utrecht$ or eindhoven$ or hague$ or den haag$ or canada$ or canadian$ or ontario$ or quebec$ or nova scotia$ or new brunswick$ or manitoba$ or british columbia$ or prince edward island$ or saskatchewan$ or alberta$ or newfoundland$ or yukon$ or nunavut$ or toronto$ or montreal$ or halifax$ or winnipeg$ or vancouver$ or charlottetown$ or saskatoon$ or calgary$ or britain$ or "united kingdom$" or uk or england$ or northern ireland$ or wales$ or scotland$ or british or english or scottish or welsh or northern irish or london$ or birmingham$ or leeds$ or glasgow$ or sheffield$ or edinburgh$ or liverpool$ or manchester$ or bristol$ or belfast$ or cardiff$ or nottingham$ or newcastle$).ti,ab,sh,kw.	156704
8	6 and 7	4
9	5 or 8	41
10	limit 9 to yr="2003 -Current"	32

Database: EconPapers
Host: http://econpapers.repec.org/
Data Parameters: none
Date Searched: 25 March 2014
Searcher: PL
QA: TH
Strategy:

228 documents matching tuberculosis OR TB in Keywords & Title among working papers and articles and books & chapters and authors.

No bulk download so only added to RefMan if post 2003, case study country, non-animals, in English and also relevant to scope.

Added to RefMan n=7

Database: Embase
Host: Ovid
Data Parameters: Embase 1974 to 2014 March 31
Date Searched: 1 April 2014
Searcher: PL
QA: TH
Strategy:

Database(s): **Embase** 1974 to 2014 March 31
Search Strategy:

#	Searches	Results
1	exp *tuberculosis/ or *tuberculosis control/	147431
2	(Tuberculosis or TB).ti,ab,kw.	168266
3	1 or 2	206842
4	*strategic planning/	219
5	*health care delivery/	49403
6	*program evaluation/	127
7	*integrated health care system/	4180
8	*program development/	4069
9	*patient care planning/	8681
10	*health care planning/	31125
11	*centralization/	231
12	*financial management/	42319
13	*national health service/	22741
14	*multihospital system/	4449
15	*"organization and management"/	19442
16	*resource allocation/	3119
17	*capacity building/	353
18	*organizational structure/	84
19	*decentralization/	209
20	*organizational restructuring/	36
21	or/4-20	178134
22	3 and 21	693
23	((tuberculosis or tb) adj3 (service$ or program$ or system$ or resource$ or intervention$ or scheme$) adj3 (commission$ or provid$ or provision$ or toolkit$ or planning or planner$ or deliver$ or ratio or ratios or implement$ or audit$ or survey$ or mechanism$ or referral$ or integrat$ or requirement$ or utilis$ or utiliz$ or reorganis$ or reorganiz$ or organis$ or organiz$ or manage$ or centralis$ or centraliz$ or coordinat$ or decentrali$ or devolv$ or devolution$ or framework$ or capacity or capacities or collaborat$ or pathway$ or structur$ or model$ or evaluat$ or configur$ or access$ or contract$ or develop$ or need or needs or network$ or agency or agencies or component$ or district$ or strateg$ or determinant$ or priorit$ or leverage$ or dedicat$ or workload$ or policy or policies or process$ or protocol$)).ti,ab.	1303
24	((tuberculosis or tb) adj3 ((contact$ adj2 trac$) or diagnos$ or treat$) adj3 (deliver$ or commission$ or provid$ or provision$ or organis$ or organiz$ or model$ or pathway$ or planning or planner$ or ratio or ratios or audit$ or coordinat$ or strateg$ or reorganis$ or reorganiz$ or centralis$ or centraliz$ or decentrali$ or structur$)).ti,ab.	553
25	or/22-24	2401
26	(service$ or program$ or system$ or resource$ or intervention$ or scheme$).ti,ab.	4262004
27	3 and 26	29947
28	Netherlands/	55371
29	Spain/	62484

30	Canada/	125662
31	united kingdom/	322853
32	(new york$ or nyc).ti,ab.	87073
33	(spain$ or spanish or catalan$ or catalonia$ or barcelona$).ti,ab.	74717
34	(netherlands or dutch or holland$ or amsterdam$ or rotterdam$ or utrecht$ or eindhoven$ or hague$ or den haag$).ti,ab.	79114
35	(canada$ or canadian$ or ontario$ or quebec$ or nova scotia$ or new brunswick$ or manitoba$ or british columbia$ or prince edward island$ or saskatchewan$ or alberta$ or newfoundland$ or yukon$ or nunavut$ or toronto$ or montreal$ or halifax$ or winnipeg$ or vancouver$ or charlottetown$ or saskatoon$ or calgary$).ti,ab.	146873
36	(britain$ or "united kingdom$" or uk or england$ or northern ireland$ or wales$ or scotland$ or british or english or scottish or welsh or northern irish or london$ or birmingham$ or leeds$ or glasgow$ or sheffield$ or edinburgh$ or liverpool$ or manchester$ or bristol$ or belfast$ or cardiff$ or nottingham$ or newcastle$).ti,ab.	445842
37	or/28-36	1064612
38	27 and 37	2217
39	25 or 38	4462
40	limit 39 to english language	3818
41	limit 40 to yr="2003 -Current "	2625
42	exp animals/ not humans/	4348725
43	41 not 42	2477
44	(cow or cows or cattle or bovine or calves or badger or badgers or hedgehog or hedgehogs or mice or mouse or rat or rats).mp.	3233916
45	43 not 44	2423
46	letter/ or historical article/ or comment/ or editorial/	1291550
47	45 not 46	2390
48	limit 47 to embase	1950

Database: Health Management Information Consortium (HMIC)
Host: Ovid
Data Parameters: HMIC Health Management Information Consortium 1979 to January 2014
Date Searched: 28 March 2014
Searcher: PL
QA: TH
Strategy:

Database(s): **HMIC Health Management Information Consortium** 1979 to January 2014
Search Strategy:

#	Searches	Results
1	((tuberculosis or tb) adj3 (service$ or program$ or system$ or resource$ or intervention$ or scheme$) adj3 (commission$ or provid$ or provision$ or toolkit$ or planning or planner$ or deliver$ or ratio or ratios or implement$ or audit$ or survey$ or mechanism$ or referral$ or integrat$ or requirement$ or utilis$ or utiliz$ or reorganis$ or reorganiz$ or organis$ or organiz$ or manage$ or centralis$ or centraliz$ or coordinat$ or decentrali$ or devolv$ or devolution$ or framework$ or capacity or capacities or collaborat$ or pathway$ or structur$ or model$ or evaluat$ or configur$ or access$ or contract$ or develop$ or need or needs or network$ or agency or agencies or component$ or district$ or strateg$ or determinant$ or priorit$ or leverage$ or dedicat$ or workload$ or policy or policies or process$ or protocol$)).ti,ab,sh.	34
2	((tuberculosis or tb) adj3 ((contact$ adj2 trac$) or diagnos$ or treat$) adj3 (deliver$ or commission$ or provid$ or provision$ or organis$ or organiz$ or model$ or pathway$ or planning or planner$ or ratio or ratios or audit$ or coordinat$ or strateg$ or reorganis$ or reorganiz$ or centralis$ or centraliz$ or decentrali$ or structur$)).ti,ab,sh.	5
3	((tuberculosis or tb) and (service$ or program$ or system$ or resource$ or intervention$ or scheme$)).ti,ab,sh.	418
4	(new york$ or nyc or spain$ or spanish or catalan$ or catalonia$ or barcelona$ or netherlands or dutch or holland$ or amsterdam$ or rotterdam$ or utrecht$ or eindhoven$ or hague$ or den haag$ or canada$ or canadian$ or ontario$ or quebec$ or nova scotia$ or new brunswick$ or manitoba$ or british columbia$ or prince edward island$ or saskatchewan$ or alberta$ or newfoundland$ or yukon$ or nunavut$ or toronto$ or montreal$ or halifax$ or winnipeg$ or vancouver$ or charlottetown$ or saskatoon$ or calgary$ or britain$ or "united kingdom$" or uk or england$ or northern ireland$ or wales$ or scotland$ or british or english or scottish or welsh or northern irish or london$ or birmingham$ or leeds$ or glasgow$ or sheffield$ or edinburgh$ or liverpool$ or manchester$ or bristol$ or belfast$ or cardiff$ or nottingham$ or newcastle$).ti,ab,sh.	85926
5	3 and 4	151
6	1 or 2 or 5	171
7	limit 6 to yr="2003 -Current"	100

Database: MEDLINE
Host: Ovid
Data Parameters: Database(s): **Ovid MEDLINE(R)** 1946 to March Week 3 2014
Date Searched: 28 March 2014
Searcher: PL
QA: LW
Strategy:

Database(s): **Ovid MEDLINE(R)** 1946 to March Week 3 2014
Search Strategy:

#	Searches	Results
1	exp tuberculosis/	153772
2	(Tuberculosis or TB).ti,ab,kw.	140229
3	1 or 2	188790
4	og.fs.	371460
5	Delivery of Health Care/	64015
6	Program Evaluation/	45094
7	"Delivery of Health Care, Integrated"/	8168
8	Health Services Administration/	3981
9	Models, Organizational/	14803
10	National Health Programs/	25376
11	Program Development/	22194
12	Patient Care Planning/	32796
13	exp health planning/	272374
14	exp Health Planning Organizations/	4421
15	Centralized Hospital Services/	745
16	"Health Services Needs and Demand"/	40716
17	exp financial management/	77836
18	state medicine/	47257
19	Multi-Institutional Systems/	6801
20	planning techniques/	13585
21	Public Health Administration/	14007
22	exp resource allocation/	14927
23	Decision Making, Organizational/	10412
24	Organizational Objectives/	17573
25	capacity building/	650
26	Organizational Policy/	12255
27	regional health planning/	5010
28	Community Health Planning/	4371
29	Health Facility Planning/	1843
30	"Referral and Consultation"/	50685
31	or/4-30	762705
32	3 and 31	4978
33	((tuberculosis or tb) adj3 (service$ or program$ or system$ or resource$ or intervention$ or scheme$) adj3 (commission$ or provid$ or provision$ or toolkit$ or planning or planner$ or deliver$ or ratio or ratios or implement$ or audit$ or survey$ or mechanism$ or referral$ or integrat$ or requirement$ or utilis$ or utiliz$ or reorganis$ or reorganiz$ or organis$ or organiz$ or manage$ or centralis$ or centraliz$ or coordinat$ or decentrali$ or devolv$ or devolution$ or framework$ or capacity or capacities or collaborat$ or pathway$ or structur$ or model$ or evaluat$ or configur$ or access$ or contract$ or develop$ or need or needs or network$ or agency or agencies or component$ or district$	1047

	or strateg$ or determinant$ or priorit$ or leverage$ or dedicat$ or workload$ or policy or policies or process$ or protocol$)).ti,ab.	
34	((tuberculosis or tb) adj3 ((contact$ adj2 trac$) or diagnos$ or treat$) adj3 (deliver$ or commission$ or provid$ or provision$ or organis$ or organiz$ or model$ or pathway$ or planning or planner$ or ratio or ratios or audit$ or coordinat$ or strateg$ or reorganis$ or reorganiz$ or centralis$ or centraliz$ or decentrali$ or structur$)).ti,ab.	429
35	or/32-34	5965
36	(service$ or program$ or system$ or resource$ or intervention$ or scheme$).ti,ab.	3196787
37	3 and 36	23499
38	new york/	22045
39	new york city/	16979
40	Netherlands/	48616
41	Spain/	52550
42	exp Canada/	118490
43	exp great britain/	297991
44	(new york$ or nyc).ti,ab.	46910
45	(spain$ or spanish or catalan$ or catalonia$ or barcelona$).ti,ab.	51968
46	(netherlands or dutch or holland$ or amsterdam$ or rotterdam$ or utrecht$ or eindhoven$ or hague$ or den haag$).ti,ab.	52135
47	(canada$ or canadian$ or ontario$ or quebec$ or nova scotia$ or new brunswick$ or manitoba$ or british columbia$ or prince edward island$ or saskatchewan$ or alberta$ or newfoundland$ or yukon$ or nunavut$ or toronto$ or montreal$ or halifax$ or winnipeg$ or vancouver$ or charlottetown$ or saskatoon$ or calgary$).ti,ab.	103384
48	(britain$ or "united kingdom$" or uk or england$ or northern ireland$ or wales$ or scotland$ or british or english or scottish or welsh or northern irish or london$ or birmingham$ or leeds$ or glasgow$ or sheffield$ or edinburgh$ or liverpool$ or manchester$ or bristol$ or belfast$ or cardiff$ or nottingham$ or newcastle$).ti,ab.	270363
49	or/38-48	818436
50	37 and 49	1752
51	35 or 50	7376
52	limit 51 to yr="2003 -Current"	3894
53	limit 52 to english language	3347
54	exp animals/ not humans/	3905320
55	(cow or cows or cattle or bovine or calves or badger or badgers or hedgehog or hedgehogs or mice or mouse or rat or rats).mp.	2893246
56	54 or 55	4620804
57	53 not 56	3149
58	letter/ or historical article/ or comment/ or editorial/	1522650
59	57 not 58	2886
60	remove duplicates from 59	2796

Database: MEDLINE-in-Process
Host: Ovid
Data Parameters: Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations March 27, 2014
Date Searched: 28 March 2014
Searcher: PL
QA: TH
Strategy:

Database(s): **Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations** March 27, 2014
Search Strategy:

#	Searches	Results
1	((tuberculosis or tb) adj3 (service$ or program$ or system$ or resource$ or intervention$ or scheme$) adj3 (commission$ or provid$ or provision$ or toolkit$ or planning or planner$ or deliver$ or ratio or ratios or implement$ or audit$ or survey$ or mechanism$ or referral$ or integrat$ or requirement$ or utilis$ or utiliz$ or reorganis$ or reorganiz$ or organis$ or organiz$ or manage$ or centralis$ or centraliz$ or coordinat$ or decentrali$ or devolv$ or devolution$ or framework$ or capacity or capacities or collaborat$ or pathway$ or structur$ or model$ or evaluat$ or configur$ or access$ or contract$ or develop$ or need or needs or network$ or agency or agencies or component$ or district$ or strateg$ or determinant$ or priorit$ or leverage$ or dedicat$ or workload$ or policy or policies or process$ or protocol$)).ti,ab.	105
2	((tuberculosis or tb) adj3 ((contact$ adj2 trac$) or diagnos$ or treat$) adj3 (deliver$ or commission$ or provid$ or provision$ or organis$ or organiz$ or model$ or pathway$ or planning or planner$ or ratio or ratios or audit$ or coordinat$ or strateg$ or reorganis$ or reorganiz$ or centralis$ or centraliz$ or decentrali$ or structur$)).ti,ab.	51
3	((tuberculosis or tb) and (service$ or program$ or system$ or resource$ or intervention$ or scheme$)).ti,ab.	2095
4	(new york$ or nyc or spain$ or spanish or catalan$ or catalonia$ or barcelona$ or netherlands or dutch or holland$ or amsterdam$ or rotterdam$ or utrecht$ or eindhoven$ or hague$ or den haag$ or canada$ or canadian$ or ontario$ or quebec$ or nova scotia$ or new brunswick$ or manitoba$ or british columbia$ or prince edward island$ or saskatchewan$ or alberta$ or newfoundland$ or yukon$ or nunavut$ or toronto$ or montreal$ or halifax$ or winnipeg$ or vancouver$ or charlottetown$ or saskatoon$ or calgary$ or britain$ or "united kingdom$" or uk or england$ or northern ireland$ or wales$ or scotland$ or british or english or scottish or welsh or northern irish or london$ or birmingham$ or leeds$ or glasgow$ or sheffield$ or edinburgh$ or liverpool$ or manchester$ or bristol$ or belfast$ or cardiff$ or nottingham$ or newcastle$).ti,ab.	54654
5	3 and 4	117
6	1 or 2 or 5	261
7	(cow or cows or cattle or bovine or calves or badger or badgers or hedgehog or hedgehogs or mice or mouse or rat or rats).mp.	81693
8	6 not 7	238
9	letter/ or historical article/ or comment/ or editorial/	74121
10	8 not 9	233
11	limit 10 to yr="2003 -Current"	202
12	limit 11 to english language	190

Database: PsychINFO
Host: Ovid
Data Parameters: PsycINFO 1806 to March Week 4 2014
Date Searched: 1 April 2014
Searcher: PL
QA: TH
Strategy:

Database(s): **PsycINFO** 1806 to March Week 4 2014
Search Strategy:

#	Searches	Results
1	exp tuberculosis/	768
2	(Tuberculosis or TB).ti,ab.	2136
3	1 or 2	2186
4	health care delivery/	16299
5	Program Evaluation/	9957
6	organizational effectiveness/	8837
7	program development/	5019
8	exp Treatment Planning/	4082
9	decentralization/	242
10	health service needs/	4029
11	resource allocation/	2242
12	management planning/	1128
13	management decision making/	3189
14	government policy making/	15441
15	health care administration/	1051
16	health care policy/	6523
17	health care services/	25633
18	health care utilization/	11731
19	organizational structure/	5487
20	or/4-19	107052
21	3 and 20	210
22	((tuberculosis or tb) adj3 (service$ or program$ or system$ or resource$ or intervention$ or scheme$) adj3 (commission$ or provid$ or provision$ or toolkit$ or planning or planner$ or deliver$ or ratio or ratios or implement$ or audit$ or survey$ or mechanism$ or referral$ or integrat$ or requirement$ or utilis$ or utiliz$ or reorganis$ or reorganiz$ or organis$ or organiz$ or manage$ or centralis$ or centraliz$ or coordinat$ or decentrali$ or devolv$ or devolution$ or framework$ or capacity or capacities or collaborat$ or pathway$ or structur$ or model$ or evaluat$ or configur$ or access$ or contract$ or develop$ or need or needs or network$ or agency or agencies or component$ or district$ or strateg$ or determinant$ or priorit$ or leverage$ or dedicat$ or workload$ or policy or policies or process$ or protocol$)).ti,ab.	41
23	((tuberculosis or tb) adj3 ((contact$ adj2 trac$) or diagnos$ or treat$) adj3 (deliver$ or commission$ or provid$ or provision$ or organis$ or organiz$ or model$ or pathway$ or planning or planner$ or ratio or ratios or audit$ or coordinat$ or strateg$ or reorganis$ or reorganiz$ or centralis$ or centraliz$ or decentrali$ or structur$)).ti,ab.	20
24	or/21-23	253
25	(service$ or program$ or system$ or resource$ or intervention$ or scheme$).ti,ab.	976841
26	3 and 25	846
27	(new york$ or nyc).ti,ab.	17009
28	(spain$ or spanish or catalan$ or catalonia$ or barcelona$).ti,ab.	33981
29	(netherlands or dutch or holland$ or amsterdam$ or rotterdam$ or utrecht$ or eindhoven$	22635

	or hague$ or den haag$).ti,ab.	
30	(canada$ or canadian$ or ontario$ or quebec$ or nova scotia$ or new brunswick$ or manitoba$ or british columbia$ or prince edward island$ or saskatchewan$ or alberta$ or newfoundland$ or yukon$ or nunavut$ or toronto$ or montreal$ or halifax$ or winnipeg$ or vancouver$ or charlottetown$ or saskatoon$ or calgary$).ti,ab.	38606
31	(britain$ or "united kingdom$" or uk or england$ or northern ireland$ or wales$ or scotland$ or british or english or scottish or welsh or northern irish or london$ or birmingham$ or leeds$ or glasgow$ or sheffield$ or edinburgh$ or liverpool$ or manchester$ or bristol$ or belfast$ or cardiff$ or nottingham$ or newcastle$).ti,ab.	185445
32	or/27-31	274105
33	26 and 32	75
34	24 or 33	313
35	limit 34 to yr="2003 -Current"	241
36	limit 35 to english language	235

Database: Social Policy and Practice (SPP)
Host: Ovid
Data Parameters: Social Policy and Practice 201401
Date Searched: 28 March 2014
Searcher: PL
QA: TH
Strategy:

Database(s): **Social Policy and Practice** 201401
Search Strategy:

#	Searches	Results
1	((tuberculosis or tb) adj3 (service$ or program$ or system$ or resource$ or intervention$ or scheme$) adj3 (commission$ or provid$ or provision$ or toolkit$ or planning or planner$ or deliver$ or ratio or ratios or implement$ or audit$ or survey$ or mechanism$ or referral$ or integrat$ or requirement$ or utilis$ or utiliz$ or reorganis$ or reorganiz$ or organis$ or organiz$ or manage$ or centralis$ or centraliz$ or coordinat$ or decentrali$ or devolv$ or devolution$ or framework$ or capacity or capacities or collaborat$ or pathway$ or structur$ or model$ or evaluat$ or configur$ or access$ or contract$ or develop$ or need or needs or network$ or agency or agencies or component$ or district$ or strateg$ or determinant$ or priorit$ or leverage$ or dedicat$ or workload$ or policy or policies or process$ or protocol$)).ti,ab,sh.	4
2	((tuberculosis or tb) adj3 ((contact$ adj2 trac$) or diagnos$ or treat$) adj3 (deliver$ or commission$ or provid$ or provision$ or organis$ or organiz$ or model$ or pathway$ or planning or planner$ or ratio or ratios or audit$ or coordinat$ or strateg$ or reorganis$ or reorganiz$ or centralis$ or centraliz$ or decentrali$ or structur$)).ti,ab,sh.	0
3	((tuberculosis or tb) and (service$ or program$ or system$ or resource$ or intervention$ or scheme$)).ti,ab,sh.	59
4	(new york$ or nyc or spain$ or spanish or catalan$ or catalonia$ or barcelona$ or netherlands or dutch or holland$ or amsterdam$ or rotterdam$ or utrecht$ or eindhoven$ or hague$ or den haag$ or canada$ or canadian$ or ontario$ or quebec$ or nova scotia$ or new brunswick$ or manitoba$ or british columbia$ or prince edward island$ or saskatchewan$ or alberta$ or newfoundland$ or yukon$ or nunavut$ or toronto$ or montreal$ or halifax$ or winnipeg$ or vancouver$ or charlottetown$ or saskatoon$ or calgary$ or britain$ or "united kingdom$" or uk or england$ or northern ireland$ or wales$ or scotland$ or british or english or scottish or welsh or northern irish or london$ or birmingham$ or leeds$ or glasgow$ or sheffield$ or edinburgh$ or liverpool$ or manchester$ or bristol$ or belfast$ or cardiff$ or nottingham$ or newcastle$).ti,ab,sh.	163267
5	3 and 4	29
6	1 or 2 or 5	31
7	limit 6 to yr="2003 -Current"	17

The following websites were browsed for relevant documents. All sites were also searched for “TB” or “tuberculosis. The website searching was conducted 10-14 March 2014.

- African Health Forum via http://www.africanhealthforum.org.uk/index.htm
- Agency for Health Care Research and Quality via http://www.ahrq.gov
- Audit Commission via http://www.audit-commission.gov.uk
- Australian Clinical Practice Guidelines Portal via http://www.clinicalguidelines.gov.au/
- Black Health Agency via http://www.thebha.org.uk
- British Infection Association via http://www.britishinfection.org/drupal/
- British Society for Antimicrobial Chemotherapy via http://bsac.org.uk
- British Thoracic Society via http://www.brit-thoracic.org.uk/
- Campbell Collaboration via http://www.campbellcollaboration.org/
- Centers for Disease Control and Prevention resources on TB via http://www.cdc.gov/tb/

- Chartered Institute of Environmental Health via http://www.cieh.org/
- Cochrane Infectious Diseases Group Specialized Register via http://cidg.cochrane.org/specialized-register
- Department of Health via http://www.gov.uk
- Department of Health, Social Services and Public Safety of Northern Ireland via http://www.dhsspsni.gov.uk/
- European Centre of Disease Prevention and Control via http://www.ecdc.europa.eu
- Find TB Resources via http://www.findtbresources.org/
- Guidelines & Audit Implementation Network via http://www.gain-ni.org/
- Health & Social Care Information Centre via http://www.hscic.gov.uk/
- Health Protection Scotland via http://www.hps.scot.nhs.uk/
- Health Quality Improvement Partnership via http://www.hqip.org.uk
- Healthcare Quality Improvement Partnership via http://www.hqip.org.uk/
- Infection Prevention Society via http://www.ips.uk.net
- Institute for Clinical Systems Improvement via https://www.icsi.org
- KNCV Tuberculosis Foundation via http://www.kncvtbc.org
- Local Government Association via http://www.local.gov.uk/
- McMaster University Health Evidence via http://www.healthevidence.org/
- National Audit Office via http://www.nao.org.uk/
- National Guideline Clearinghouse via http://www.guideline.gov/
- New York City Department of Health and Mental Health via http://www.nyc.gov/html/doh/html/diseases/tb.shtml
- NHS England via http://www.england.nhs.uk/
- NHS Health Scotland via http://www.healthscotland.com/resources/publications/search-result.aspx
- NICE via http://www.nice.org.uk/
- NICE Evidence Search https://www.evidence.nhs.uk/
- NIHR Health Services & Delivery Research Programme via NIHR Service Delivery and Organisation programme
- Nuffield Trust via http://www.nuffieldtrust.org.uk/
- OpenGrey via http://www.opengrey.eu/
- Public Health Agency of Canada via http://www.phac-aspc.gc.ca/index-eng.php
- Public Health England via https://www.gov.uk/government/organisations/public-health-england
- Public Health Observatory via http://www.apho.org.uk/
- Public Health Wales via http://www.publichealthwales.wales.nhs.uk/
- Quality, Innovation, Productivity and Prevention via http://www.evidence.nhs.uk/qipp
- Race Equality Foundation via http://www.raceequalityfoundation.org.uk
- Royal College of Nursing via https://www.rcn.org.uk/
- Royal College of Physicians via http://www.rcplondon.ac.uk/
- South Asian Health Foundation via http://www.sahf.org.uk
- Stop TB UK via http://www.stoptbuk.org/
- Target Tuberculosis via http://www.targettb.org.uk/
- TB Alert via http://www.tbalert.org/ and http://www.thetruthabouttb.org/
- Turning Research Into Practice via http://www.tripdatabase.com/
- World Health Organization via http://www.who.int/en/

Google searching
Website: Google via http://www.google.co.uk/
Date Searched: 17 March 2014

Supplementary methods

Reference harvesting - all of the references available on Web of Science were downloaded and then the full text was obtained and any further relevant references were also added

Citation searching - all of the citations available on Web of Science were downloaded

PubMed related item - if there were 1-100 references they were all downloaded if they were relevant to the scope. If there were 101 or more references they were sorted by relevance and then the first 100 were downloaded if they were relevant to the scope. Relevant to the scope meant TB or tuberculosis was in the title.

All three methods were conducted on 19 March 2014 using the following papers.

Adalat S, Paliwalla M, Novelli V et al. (2008) A survey of tuberculosis services in the UK. Archives of Disease in Childhood 93 (7): 575-577.

Balasegaram S, Grant R, Ormerod P (2008) A survey of tuberculosis clinic provision in England and Wales. Public Health 122 (6): 602.

Barrett JC, Dart S, Solamalai A et al. (2011) Tuberculosis outcome following pre-treatment assessment for directly observed or selfadministered therapy: Still room for improvement? Thorax 66: A89.

Belling R, McLaren S, Boudioni M (2012) Pan-London tuberculosis services: a service evaluation. BMC Health Serv Res. 12: 203.

Bothamley GH, Kruijshaar ME, Kunst H (2011) Tuberculosis in UK cities: workload and effectiveness of tuberculosis control programmes. BMC Public Health, 11: 896.

Cayla JA, Orcau A (2011) Control of tuberculosis in large cities in developed countries: an organizational problem. BMC Med. 9:127.

Craig GM, Booth H, Hall J et al. (Feb. 2008) Establishing a new service role in tuberculosis care: the tuberculosis link worker. Journal of Advanced Nursing 61 (4): 413-424.

de,Vries G, van Hest RA (2006) From contact investigation to tuberculosis screening of drug addicts and homeless persons in Rotterdam. Eur J Public Health. 16(2):133-6.

Flanagan NA (2004) Transitional health care for offenders being released from United States prisons. Canadian Journal of Nursing Research 36 (2): 39-59.

Frieden TR (2009) Lessons from tuberculosis control for public health. Int J Tuberc Lung Dis. 13(4):421-8.

Hemming S, Windish P, Hall J et al. (2010) Treating TB patients with no entitlement to social support-welcome to the social jungle. Thorax 65: A146.

Jensen M, Lau A, Langlois-Klassen D (2012) A population-based study of tuberculosis epidemiology and innovative service delivery in Canada. Int J Tuberc Lung Dis, 16(1): 43-9.

Jit M, Stagg HR, Aldridge RW (2011) Dedicated outreach service for hard to reach patients with tuberculosis in London: observational study and economic evaluation. BMJ, 343: d5376.

King R, Carter MJ, Mungall SB et al. (2009) Does a specialist TB nurse service improve outcome? Thorax 64: A121-A122

Millet JP, Shaw E Orcau A (2013) Tuberculosis recurrence after completion treatment in a European city: reinfection or relapse? PLoS ONE. 8(6): e64898.

Tsikoudas A (2003) Management pathways and the surgical diagnosis of tuberculous lymphadenitis: Can they be improved? The Bradford experience. ORL 65 (5): 261-265.

Post search supplementary methods

Following the initial screening a further round of supplementary searching was conducted. The papers that had been identified as potentially relevant for the review during the sifting stage were used for citation searching. All of the citations available on Web of Science were downloaded and then de-duplicated against what had already been screened. At least one paper was chosen for each of the case studies. Citation searching for effectiveness studies was conducted on 5 June 2014 and for cost effectiveness studies on 3 July 2014.

The following papers were used for citation searching for effectiveness studies.

Barcelona

Ospina JE, Orcau A, Millet JP et al. (2012) Community health workers improve contact tracing among immigrants with tuberculosis in Barcelona. BMC Public Health 12: 158

Canada

Richards B, Kozak R, Brassard P et al. (Aug. 2005) Tuberculosis surveillance among new immigrants in Montreal. International Journal of Tuberculosis & Lung Disease 9 (8): 858-864

van Hest NA, Story A, Grant AD et al. (Dec. 2008) Record-linkage and capture-recapture analysis to estimate the incidence and completeness of reporting of tuberculosis in England 1999-2002. Epidemiology & Infection 136 (12): 1606-1616

Netherlands

de VG, van Hest RA, Richardus JH (July 2007) Impact of mobile radiographic screening on tuberculosis among drug users and homeless persons. American Journal of Respiratory & Critical Care Medicine 176 (2): 201-207

Lambregts-van Weezenbeek CS, Sebek MM, van Gerven PJ et al. (Dec. 2003) Tuberculosis contact investigation and DNA fingerprint surveillance in The Netherlands: 6 years' experience with nation-wide cluster feedback and cluster monitoring. International Journal of Tuberculosis & Lung Disease 7 (12:Suppl 3): Suppl-70

New York

Munsiff SS, Ahuja SD, King L et al. (Oct. 2006) Ensuring accountability: the contribution of the cohort review method to tuberculosis control in New York City.[Erratum appears in Int J Tuberc Lung Dis. 2006 Dec;10(12):1422]. International Journal of Tuberculosis & Lung Disease 10 (10): 1133-1139

Munsiff SS, Ahuja SD, Li J et al. (June 2006) Public-private collaboration for multidrug-resistant tuberculosis control in New York City. International Journal of Tuberculosis & Lung Disease 10 (6): 639-648

Pursnani S, Srivastava S, Ali S et al. (Jan. 2014) Risk factors for and outcomes of detention of patients with TB in New York City: an update: 2002-2009. Chest 145 (1): 95-100

Udeagu CC, Dorsinville MS, Munsiff SS et al. (Oct. 2007) Evaluation of case management in tuberculosis control: a three-year effort to improve case management practices in New York City. International Journal of Tuberculosis & Lung Disease 11 (10): 1094-1100

UK (London)

Hall J, Bethell S, Helleren S et al. (2010) Evaluation of TB peer educators essential partners in metropolitan TB control. Thorax Conference (var.pagings): December

Jit M, Stagg HR, Aldridge RW et al. (2011) Dedicated outreach service for hard to reach patients with tuberculosis in London: observational study and economic evaluation. BMJ 343: d5376

White J, Anderson C, Dart S et al. (2011) Simple measures to improve TB control: Applying the cohort review process in London. Thorax Conference (var.pagings): December

Griffiths C, Sturdy P, Brewin P et al. (May 2007) Educational outreach to promote screening for tuberculosis in primary care: a cluster randomised controlled trial. Lancet 369 (9572): 1528-153

Story A, Windish P, Hall J et al. (2009) "Find&Treat": Returning the lost back to local tuberculosis services. Thorax Conference (var.pagings): December

UK (national)

Abubakar I, Chalkley D, McEvoy M et al. (Feb. 2006) Evaluating compliance with national guidelines for the clinical, laboratory and public health management of tuberculosis in a low-prevalence English district. Public Health 120 (2): 155-160

Ahmed S, Newton A, Allison T (Sept. 2007) Tuberculosis in a Yorkshire prison: case report. Euro Surveillance: Bulletin Europeen sur les Maladies Transmissibles = European Communicable Disease Bulletin 12 (9): E13-E14

Backx M, Curtis H, Freedman A et al. (June 2011) British HIV Association national audit on the management of patients co-infected with tuberculosis and HIV. Clinical Medicine 11 (3): 222-226

Bothamley GH, Kruijshaar ME, Kunst H et al. (2011) Tuberculosis in UK cities: workload and effectiveness of tuberculosis control programmes. BMC Public Health 11: 896

Browne C, Munang ML, Evans JS et al. (2013) Impact of TB cluster investigation in a new migrant community. Thorax Conference (var.pagings): December

Cullen D, Watson JP, Davies PDO (2012) BTS MDRTB clinical advice service. Thorax Conference (var.pagings): December

King R, Carter MJ, Mungall SB et al. (2009) Does a specialist TB nurse service improve outcome? Thorax Conference (var.pagings): December

Lynch CA, Sabah S, Dedicoat M et al. (2013) Does a direct Radiology referral system to a rapid access Tuberculosis clinic improve TB diagnosis? Thorax Conference (var.pagings): December

Panchal RK, Woltmann G, Haldar P (2012) Reduced effectiveness of the primary-care registry for targeted LTBI screening of high risk immigrants with HIV co-infection. Thorax Conference (var.pagings): December

van Hest NA, Story A, Grant AD et al. (Dec. 2008) Record-linkage and capture-recapture analysis to estimate the incidence and completeness of reporting of tuberculosis in England 1999-2002. Epidemiology & Infection 136 (12): 1606-1616

The following papers were used for citation searching for cost effectiveness studies.

Brian R, Stewart C, Okpaluba U, and Evans A (2009) Introducing a protocol for diagnosing and treating latent TB in newly diagnosed HIV patients: feasibility and cost-effectiveness. HIV Medicine 10(sup 1), P72, p31.

Jit M, Stagg HR, Aldridge RW et al. (2011) Dedicated outreach service for hard to reach patients with tuberculosis in London: observational study and economic evaluation. BMJ 343: d5376.

King R, Carter MJ, Mungall SB et al. (2009) Does a specialist TB nurse service improve outcome? Thorax 64 (sup IV), P110, A121.

Li J, Marks M, Driver C, et al (2007) Human immunodeficiency virus counselling, testing, and referral of close contacts to patients with pulmonary tuberculosis: feasibility and costs J Public Health Management Practice; 13 (3), 252-62.

Appendix 2 Screening criteria

High level sift criteria – title only stage

Patient / Population / Problem

TB – yes/no

Country

i.	United Kingdom (any place, city, region, nation)
ii.	North America [*USA/Canada*] (any place, city, region, nation)
iii.	Spain (any city, region, place)
iv.	Netherlands/Holland (any city, region, place)
v.	European – ambiguous: (i.e. WHO/EU reports) – but if clearly [ONLY] about a city/place/region not one of our targets i.e. NZ, AUS, AFRICA, FRANCE, BELGIUM, ITALY, INDIA etc…. Exclude

Second level sift criteria – title and abstract stage

Patient / Population / Problem

Individual: Anyone diagnosed with active or latent TB Anyone @ increased risk of active TB: i. Exposure risk ii. Progression risk	Country: vi. United Kingdom vii. USA (New York) viii. Spain (Barcelona) ix. Netherlands x. Canada

Intervention / Indicator / Prognostic Factor / Exposure

Organisational: i. structure, infra-structure, ii. model of care, iii. throughput/ referral route Delivery (setting, mechanism, mode): i. clinic, outreach, accessibility, community ii. clinician, professional, voluntary, lay, peer iii. process, practice, procedure	Commissioning: i. local, regional, national ii. who, how, when, where iii. national strategy Accountability/reporting: i. information/knowledge management ii. auditing/processes iii. scrutiny (who) or regulation (i.e. law)

Comparison / Intervention / Alternative (if appropriate)

N/A

Outcome

N/A

Study Type (if appropriate)

N/A

Full text screening criteria stage

L1. Patient / Population / Problem

Individual: Anyone diagnosed with active or latent TB Anyone at increased risk of active TB (and TB is a component of the paper): iii. Exposure risk iv. Progression risk	Country: xi. United Kingdom xii. New York xiii. Barcelona xiv. Netherlands xv. Canada

L2. Intervention / Indicator / Prognostic Factor / Exposure

Organisational: iv. structure, infra-structure, v. model of care, vi. throughput/ referral route Delivery (setting, mechanism, mode): iv. clinic, outreach, accessibility, community v. clinician, professional, voluntary, lay, peer vi. process, practice, procedure	Commissioning: iv. local, regional, national v. who, how, when, where Accountability/reporting: iv. information/knowledge management v. auditing/processes vi. scrutiny (who)

L3. Comparisons

Does this paper describe any associations between service changes (see L2.) and TB outcomes (see L4.)? If so include (if not but still relevant then filter to case study background).

L4. Outcome

Incidence / Prevalence change: i. National ii. Regional iii. Local	And (where appropriate)… i. Diagnosis rates / time to diagnosis ii. Contacts traced iii. Treatment completion rates
	a. Transmission rates b. *Screening opportunities*

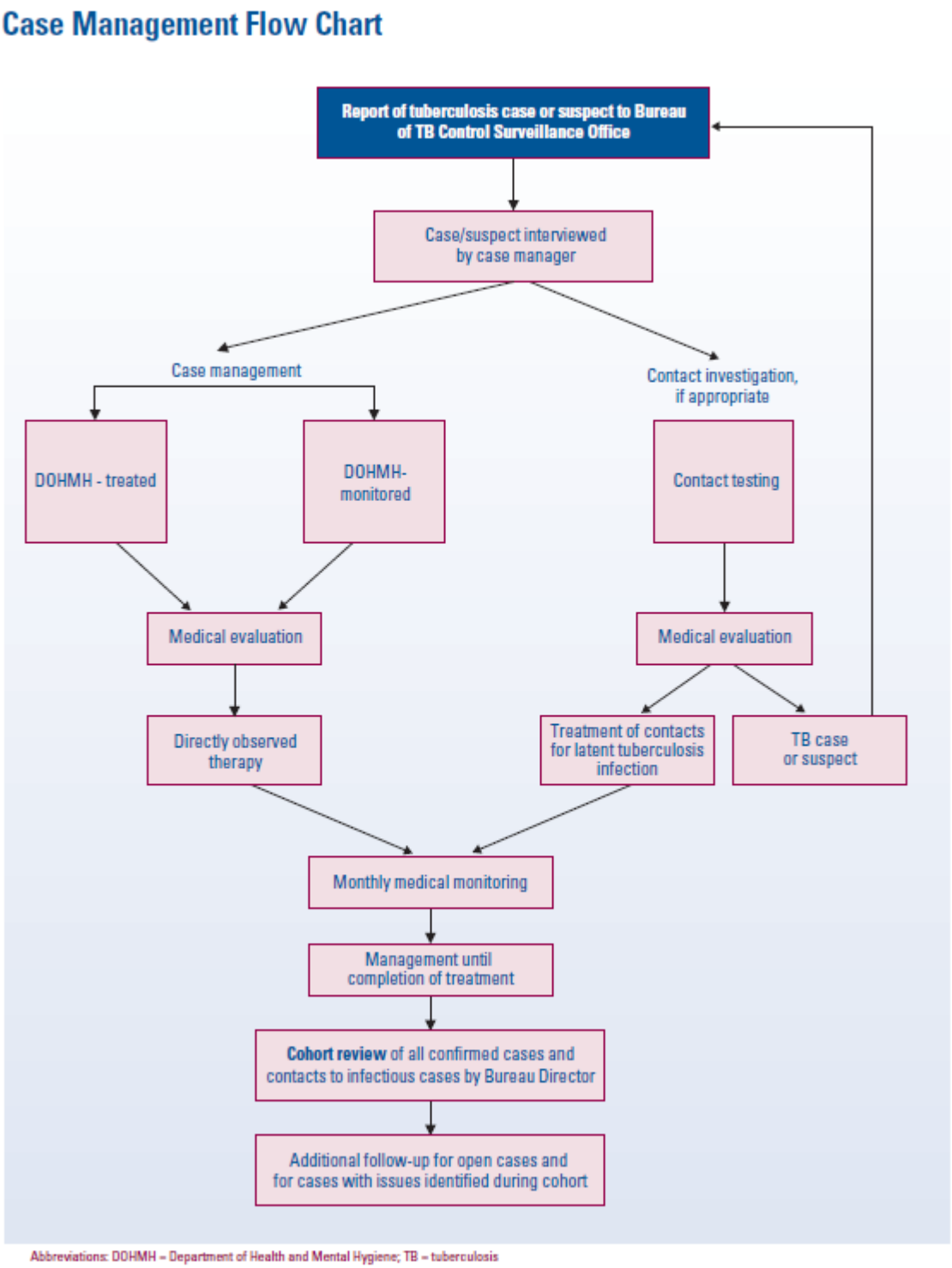
L5. Study Type (if appropriate)

Cohort (prospective/retrospective) Before and After Audit Survey	Observational: i. Cross-sectional (?) ii. Ecological/Correlational (?) iii. Case reports/case series (?)
Process evaluations: examination of different services/models or frameworks which include athematic or other analysis on ‘what the drivers of change are or descriptions of how services are configured?	

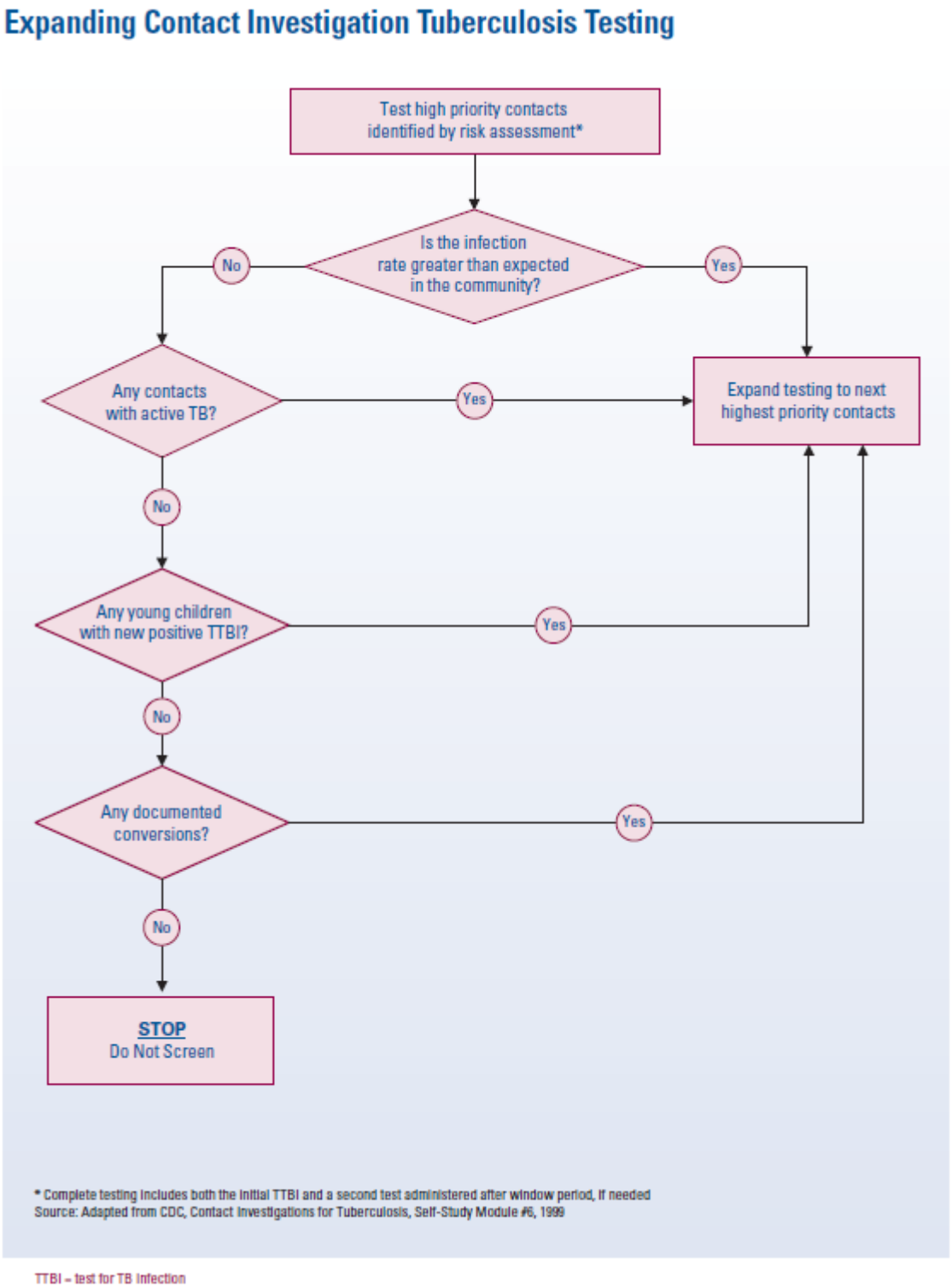
Appendix 3 Additional case study material

Non-UK service models

Case Management in NYC (B44 Munsiff 2008) p.135



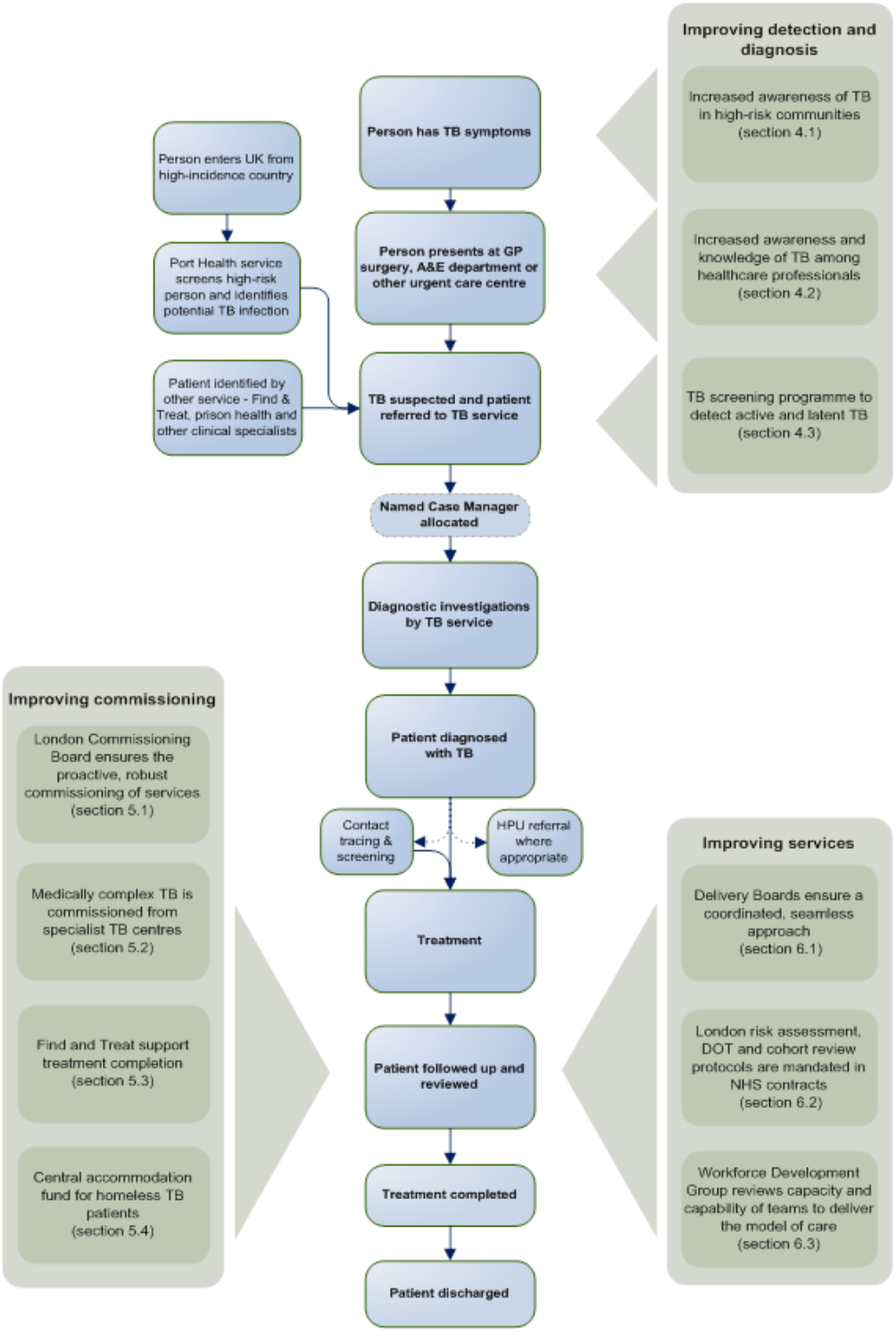
Delivery Model for the expansion of TB contact tracing in NYC. (B 44 Munsiff 2008 p.166)



UK service models

London model

Three levels:
Level 1 - Generic primary and community care
Level 2 - Recognised TB services
Level 3 - Very specialist services



Appendix 4 Data extraction sheets for effectiveness review (31 studies)

UK National (5 studies)

Backx 2011

Authors: Backx, M., Curtis, H., Freedman, A., & Johnson, M.
Year: 2011
Citation: British HIV Association national audit on the management of patients co-infected with tuberculosis and HIV.
Location: UK - National
Aim of study: The objective was to compare current UK management of TB-HIV with national standards, including diagnostic delay and treatment completion.
Study design: Audit
Quality score: Not evaluated in CA
External validity score: Not evaluated in CA

Population and setting

Source population
UK services providing HIV care.

Eligible population
Services listed in the British HIV Association (BHIVA) database and were thought to provide adult HIV care.

Selected population
Services with case notes of HIV positive patients aged 16+ who started therapy for active TB during October 2007 – April 2008 and their corresponding TB services if separate.

Excluded population
Records of patients receiving chemoprophylaxis for LTBI. Records of patients where TB therapy commenced but subsequently stopped due to alternative diagnosis.

Population characteristics
Men: 47%; Black African: 74.6%; from high TB prevalence countries: 84.7%; aged 30-50: 73.7%; aged 30 and younger: 13.6%; aged 50+: 9.8%; had advanced HIV disease: 69.1%; pulmonary TB: 40.7%; extra-pulmonary disease: 41.9%; pulmonary + extra-pulmonary disease: 17.4%; culture-confirmed TB: 57.6%; positive microscopy for acid-fast bacilli: 13.6%

Setting
Services offering adult HIV care.

Location
UK – National

Methods of allocation to intervention/control

Method of allocation
NA

Method to minimise confounding
NR

Recruitment strategy
NA

Sample sizes:
Total sample N**=** 124 HIV services and 18 corresponding TB services. Of the 124 HIV services, 105 were not fully integrated, and 19 were fully integrated providing care for TB, HIV and TB-HIV **Intervention** N= 236 HIV positive patients who started treatment for TB
Comparator N= 236 HIV positive patients who started treatment for TB

Baseline comparisons
NA

Power of study

Intervention
Current (2007/8) management of TB-HIV co-infection in the UK.

Comparator
National standards.

NR	
Outcomes and methods of analysis	
Outcomes TB treatment completion and culture confirmed pulmonary TB compared to national recommendations from the chief medical officer. Time to obtain sputum smear results compared to national standards from the Health Protection Agency. TB notification compared to Public Health Act 1913. Also assessed HIV testing of TB patients. **Follow up period** NA	**Methods of analysis** Demographics, including proportions.
Service delivery results	
DIAGNOSTIC DELAYS **Time between sample taken and results received in 60 sputum smear positive cases:** 45% (27/60): same or next day 16.7% (10/60): within 2-3 days 25% (15/60): 4+ days 13.3% (8/60): data unavailable National recommendation: positive results within 24 hours on six day/week service, and all results in writing within 72 hours. **TREATMENT COMPLETION:** **Patient treatment status at time of audit:** Treatment completed without interruption: 61% (144/236) Treatment ongoing: 21.6% (51/236) Therapy interrupted: 5.1% (12/236) **Reasons for failure to complete treatment:** Left UK: 4.7% (11/236) Transferred care within UK: 2.5% (6/236) Died before treatment completion: 2.5% (6/236) Lost to follow-up: 2.5% (6/236) **Excluding patients still on therapy:** 81.2% (147/181[#]): completed TB therapy 4.7% (11/181): left UK while on treatment 2.5% (6/181): transferred care within UK 2.5% (6/181): died before treatment completion 2.5% (6/181): lost to follow-up National recommendation: > 85% treatment completed.	**Other results** **Proportion known TB Notifications** Notification documented: 36.0% (85/236) Believed to be documented: 47.9% (113/236) Not notified: 2.5% (6/236) – 3/6 had sputum smear positive pulmonary TB Notification status known: 13.6% (32/236) **Proportion patients with TB culture confirmation** Culture-confirmed: 57.6% (136/236) Culture-confirmed pulmonary TB: 65.7% (90/137) **Proportion services offering routine HIV testing:** Integrated TB-HIV services: 68% (13/19) TB services: 56% (10/18) **Proportion patients receiving HIV testing** HIV diagnosis prior to TB investigation: 55.5% Diagnosed during TB investigation: 42% **Attrition details** 124/170 HIV services responded.
Notes and other information	
Author conclusions Excluding patients still on treatment, treatment completion rate was close to target (81% reached, 85% goal). Unacceptable diagnostic delays were observed as the majority of sputum smear positive cases were not reported within the recommended 24 hours. Many services do not routinely test TB patients for HIV. **Author limitations** There was a poor response rate from TB services not providing integrated TB-HIV care that was likely due to being	**Limitation identified by review team** A third of HIV services did not respond to the audit and TB services providing integrated TB-HIV care also had a poor response rate. It is unclear if the non-responders were different than the responders which could provide a biased picture of TB-HIV management in the UK.

indirectly recruited from HIV services. This limited information about their integrated work with HIV services. **Evidence gaps and/or recommendations for future research and policy** HIV and TB services should provide high quality co-ordinated services for diagnosis, treatment and continuing patient care. Clinicians, trusts and commissioners should work together to promote HIV testing in all healthcare settings and reduce the proportion of undiagnosed infection. **Source of funding** Department of Health	

Numbers do not appear to add up; review team unable to account for this discrepancy.

Bothamley 2011

Authors: Bothamley, G.H., Kruijshaar, M.E., Kunst, H., Woltmann, G., Cotton, M., Saralaya, D., Woodhead, M.A., Watson, J.P., & Chapman, A.L.N.
Year: 2011
Citation: Tuberculosis in UK cities: workload and effectiveness of tuberculosis control programmes. BMC Public Health, 11:896
Location: Large cities within the UK
Aim of study: The objective was to examine how the national plan for tuberculosis control had been incorporated into control programs in large UK cities.
Study design: National evaluation
Quality score: Not provided by CA
External validity score: Not provided by CA

Population and setting

Source population
Primary care trusts in the UK.

Eligible population
Primary care trusts associated with a TB service in the ten most populous urban areas in the UK (as defined by data from the 2001 census), with an average of 100 TB cases per year.

Selected population
Primary care trusts from London, Birmingham, Manchester, West Yorkshire, Glasgow, Newcastle, Liverpool, Nottingham, Sheffield, Edinburgh, Leicester, and Coventry for which data was available.

Excluded population
NR

Population characteristics:
Population covered by TB clinic – Incidence per 100,000
London: 7,747,748 – 44.4
Birmingham: 2,284,093 – 22.3
Manchester: 419,628 – 59.1
West Yorkshire: 762,461 – 15.7 (Leeds) and 467,363 – 38.3 (Bradford)
Glasgow: 866,379 – 24.2
Newcastle: 268,751 – 16.0
Liverpool: 433,333 – 12.0
Nottingham: 909,836 – 9.5
Sheffield: 530,000 – 20.0*
Edinburgh: 452,514 – 17.9
Leicester: 304,598 – 69.6
Coventry: 312,925 – 29.4

Setting
Cities in the UK.

Location
UK – urban

Methods of allocation to intervention/control

Method of allocation
NA

Method to minimise confounding
NR

Recruitment strategy
NA

Sample sizes:
Total sample N**=** 12 Cities were identified
Intervention N= NA
Comparator N= NA

Baseline comparisons
NA

Power of study
NR

Intervention
Current management of TB in the respective city/PCT.

Comparator
Comparisons were made between the cities/PCTs and against the national TB action plan

Outcomes and methods of analysis

Outcomes
Fifteen items from the TB action plan, including, named key worker, DOT, target of 1 nurse for 40 TB cases, peer review against NICE guidelines. TB treatment completed within 12 months.

Follow up period

Methods of analysis
Trend line to calculate annual percentage changes. Chi-squared test. Spearman's rank correlation.

NA	
Service delivery results	
Proportion TB treatment completed within 12 months (2006-2008): Birmingham East/North: 85.1% Heart of Birmingham Teaching: 83.1% Central Manchester: 83.5% Leeds: 80.9% Bradford and Airedale Teaching: 78.1% Sandwell: 76.8% Leicester City: 86.6% Sheffield: 75.8% London (reported as region, not PCT): 82.6% **Proportion patients who had DOT at any point during treatment last year:** Birmingham: 21% Bradford: 0% Glasgow: 0% Leeds: 3% Leicester: 5% London: 1.7% - 32% (access to DOT variable) Manchester: 2% Sheffield: 5-10% **Target of 1 nurse per 40 cases**: Birmingham: 1:60-70 Bradford: No specified TB nurses Glasgow: Not achieved Leeds: Achieved Leicester: Achieved London: Ranged from 1:21 – 1:51 Manchester: Not achieved Sheffield: Achieved	**Other results** **Formal peer review against NICE guidelines:** Birmingham: No Bradford: No Glasgow: No – Scottish guidelines awaiting agreement Leeds: Internal review Leicester: No – regular audits/epidemiological review London: Formal reviews in NE and NC London Manchester: Yes - annually Sheffield: Yes **Named worker accountable for each TB patient:** All reported as yes. **Joint TB-HIV clinic**: Birmingham: Yes Bradford: Run by infectious diseases (ID) physician Glasgow: No Leeds: Just starting Leicester: Yes between ID and genitourinary physicians London: All sectors have one or more Manchester: No, but weekly joint multidrug therapy Sheffield: Same physician **Attrition details** NA
Notes and other information	
Author conclusions TB control programmes require an adequate number of TB nurses (ratio of TB nurse to TB cases 1:40) in order to achieve early detection and effective case-holding, Good local epidemiology is important for forecasting the projected number of TB cases and resourcing appropriately. **Author limitations** London is a complex group of communities with several PCTs having a high burden of TB; as such, further detailed analysis is recommended. **Evidence gaps and/or recommendations for future research and policy** Costs for MDRTB need to be allocated through a national scheme of specialised commissioning, so as not to undermine general TB resourcing. **Source of funding** Homerton Respiratory Research and Education Fund.	**Limitation identified by review team** Obtaining data across cities was reported to be more difficult than expected, with some cities taking as long as 22 months to provide data. Data for Glasgow were reported to be affected by changes in boundaries, and data for Sheffield were flagged as being different between ETS and clinic.

* Discrepancy found in reported incidence in Manchester and Sheffield (perhaps 40.5/100,000 and 14.6/100,000 respectively).

Cullen 2012

Authors: Cullen, D., Watson, J.P., & Davies, P.D.O.
Year: 2012
Citation: British Thoracic Society MDR-TB# Clinical Advice Service. Thorax, 67(Suppl 2), A89.
Location: Online service developed in Liverpool, UK
Aim of study: The aim was to assess whether an online TB service could increase dialogue between experts and TB service users for MDR-TB case management.
Study design: National report
Quality score: Not addressed by CA
External validity score: Not addressed by CA

Population and setting

Source population Persons accessing an online TB service. **Eligible population** Persons accessing online TB service from July 2011. **Selected population** Persons accessing online TB service during a one year period starting from July 2011. **Excluded population** NR	**Population characteristics (Intervention v Comparator)** NR **Setting** Online TB service. **Location** Online service developed from an initiative in Liverpool in 2008.

Methods of allocation to intervention/control

Method of allocation NA **Method to minimise confounding** NR **Recruitment strategy** NA **Sample sizes:** **Total sample** N**=** 64 case queries **Intervention** N= NA **Comparator** N= NA **Baseline comparisons** NA **Power of study** NR	**Intervention** An online service was developed to increase dialogue between experts and service users with MDR-TB. Online forum allows service users to provide anonymised case details according to a pre-set questionnaire, to use a free text box, and post X-ray and CT images. **Comparator** NA

Outcomes and methods of analysis

Outcomes Confirmed cases of drug resistant TB. **Follow up period** NR	**Methods of analysis** Proportions.

Service delivery results

Proportion increase in case discussion since introduction of	**Other results**

service: 45% **Types of cases confirmed by service:** MDR-TB: 41/64 XDR-TB: 4/64 Isoniazid mono-resistant: 7/64 Other outcomes: Related to mycobacterium infection:1/64 Not confirmed or general requests for advice: 11/64	**Attrition details** NR
Notes and other information	
Author conclusions The online TB service has increased case discussion and is regularly being followed by further requests for help. **Author limitations** NR **Evidence gaps and/or recommendations for future research and policy** NR **Source of funding** NR	**Limitation identified by review team** The present study is an abstract and thus provides limited information on the intervention implemented and population demographics. The service is briefly described at the end of the abstract. However it is unclear whether this describes the service during the study period or whether the features have since been developed.

MDR-TB: multidrug resistant tuberculosis

Panchal 2012

Authors: Panchal, R.K., Woltmann, G., & Haldar, P.
Year: 2012
Citation: Reduced Effectiveness of the Primary-Care Registry for Targeted LTBI Screening of High Risk Immigrants with HIV Co-Infection. (Abstract). Thorax:67(Suppl 2):A1-A204. doi:10.1136/thoraxjnl-2012-202678.192
Location: UK - National
Aim of study: Objective was to investigate the effectiveness of the primary-care registry in identifying immigrants for enrolment to LTBI screening at time of GP registration.
Study design: Retrospective cohort study
Quality score: +
External validity score: +

Population and setting

Source population Immigrants in the UK **Eligible population** Immigrants with available HIV status in the primary care registry. **Selected population** Primary care registrations for immigrants entering UK after 1999 who had HIV testing performed; these were cross-referenced with foreign-born TB notifications. **Excluded population** NR	**Population characteristics (Intervention v Comparator)** HIV positive cases occurring among immigrants from TB endemic countries (incidence < 500/100,000): 67% (56 / 84) **Setting** Primary care (GP) **Location** UK - National

Methods of allocation to intervention/control

Method of allocation NA **Method to minimise confounding** NA **Recruitment strategy** NA **Sample sizes:** **Total sample** N **=** 857 foreign-born TB cases in registry **Intervention** N= 857 **Comparator** N= NA **Baseline comparisons** NA **Power of study** NR	**Intervention** Analysed effectiveness of using the primary care registry to target LTBI screening among immigrants. **Comparator** NA

Outcomes and methods of analysis

Outcomes Proportion of preventable LTBI with screening at time of GP registration among immigrants with known HIV status. **Follow up period** NA	**Methods of analysis** Proportions. Risk ratios. Interquartile ratios (IQR).

Service delivery results

Proportion immigrant TB cases preventable (if screened at GP registration): 63% (511 / 857)	**Other results** **Proportion immigrant cases:** HIV tested: 72.8% (624 / 857) HIV seropositive: 13.4% (84 / 857)

Proportion HIV+ v HIV- for TB cases unpreventable: Significantly higher for HIV+ 19% v 10%; RR (95% CI) = 1.89 (1.25 – 2.84) **Time to primary care registration:** Significantly longer for HIV+ v HIV- immigrants Median IQR: 1515 (555-2202) days v 415 (36-1558) days; $p < 0.005$ **Time to disease notification:** Significantly shorter for HIV+ v HIV- immigrants Median IQR: 587 (208-1182) days v 1163 (669-1854) days; $p < 0.005$	**Attrition details** NA
Notes and other information	
Author conclusions Targeted LTBI screening at time of primary care registration may be less effective among HIV+ immigrants. **Author limitations** NR **Evidence gaps and/or recommendations for future research and policy** The authors recommended that early GP registration and extended screening to include HIV and other blood-borne viruses is needed as part of an integrated immigrant screening programme. **Source of funding** NR	**Limitation identified by review team** As this article is an abstract, very little information is available to describe the selected population, study design, and merits or limitations of the research.

Van Hest 2008

Authors: Van Hest, N.A.H., Story, A., Grant, A.D., Antoine, D., Crofts, J.P., & Watson, J.M.
Year: 2008
Citation: Record-linkage and capture-recapture analysis to estimate the incidence and completeness of reporting of tuberculosis in England 1999 – 2002. Epidemiol. Infect.: 136, 1606-1616.
Location: England, UK
Aim of study: The aims were to estimate the annual incidence of TB in England, and use record-linkage and capture-recapture analysis to assess the completeness of TB reporting during 1999–2002.
Study design: Retrospective cohort design
Quality score: +
External validity score: +

Population and setting	
Source population TB notifications in England. **Eligible population** TB notifications in the Enhanced Tuberculosis Surveillance (ETS) system. **Selected population** TB cases notified through ETS, cases with *M. tuberculosis* complex isolates reported to MycobNet Laboratory, and cases admitted to NHS hospitals with a first or secondary hospital discharge code of TB from 1 January 1999 – 31 December 2002. **Excluded population** Duplicate records. Records with incomplete or missing data for date of birth and age.	**Population characteristics (Intervention v Comparator)** NR **Setting** TB service **Location** England - National
Methods of allocation to intervention/control	
Method of allocation NA **Method to minimise confounding** NA **Recruitment strategy** NA **Sample sizes:** **Total sample** N**=** 28,678 observed TB cases **Intervention** N= 28,678 observed TB cases **Comparator** N= 6783 observed cases in 1999; 7139 cases in 2000; 7355 cases in 2001; 7401 cases in 2002 **Baseline comparisons** NA **Power of study** NR	**Intervention** Record-linkage and capture-recapture analysis was used to estimate the annual TB incidence in England and completeness of reporting TB via the ETS system from 1999-2002. **Comparator** Comparisons were made between years from when the service was introduced.
Outcomes and methods of analysis	
Outcomes Estimated unobserved number of TB cases annually. Estimated total number of TB cases annually. Proportion laboratory-confirmed, un-notified cases, under-notified. Proportion records complete. **Follow up period** NA	**Methods of analysis** Proportions. Population mixture model. Saturated log-linear capture-recapture model. Zelterman's truncated Poisson mixture model.
Service delivery results	
Proportion cases observed, laboratory-confirmed, but un-notified: 10.4%	**Other results** **Estimated unobserved number of TB cases from Poisson mixture model (95% approximate confidence**

Proportion cases observed and under-notified: 15.9% **Proportion records complete:** 1999: 78.2% 2000: 74.1% 2001: 81.0% 2002: 83.8%	**interval [ACI]):** 1999: 1319 (1137-1509) 2002: 917 (748-1093) All (4 years; 1999 – 2002): 5417 (5217-5737) **Estimated total number of TB cases from Poisson mixture model (95% ACI):** 1999: 8102 (7920-8292) 2002: 8398 (8229-8574) All: 34,149 (33,895-34,415) **Attrition details** NA
Notes and other information	
Author conclusions Record-linkage improves accuracy of TB surveillance data and completeness of ascertained TB records, as performed in ETS. **Author limitations** Assumptions of homogeneity not met for statistical analyses. Misclassification of records would have interfered with record-linkage. Hospital TB cases provided disproportionately high number of false positive TB cases. Innate limitations of capture-recapture methods. **Evidence gaps and/or recommendations for future research and policy** To further increase notifications a clinician (such as a chest physician) should be appointed as a TB co-ordinator in every hospital, and be consulted on every TB patient in that hospital, including extra-pulmonary. **Source of funding** NR	**Limitation identified by review team** No limitations identified by review team.

UK London (9 studies)

Aldridge 2014

Authors: Aldridge R, Yates S, Hemming S et al.
Year: 2014
Citation: IMPACT OF PEER EDUCATORS ON UPTAKE OF MOBILE X-RAY TUBERCULOSIS SCREENING AT HOMELESS HOSTELS: A CLUSTER RANDOMISED CONTROLLED TRIAL. Thorax 69(S2)
Location: London, UK
Aim of study: To compare current practice of hostel staff encouraging mobile digital X-ray unit (MXU) screening for TB among homeless people with the addition of peer educators with direct experience of TB and/or homelessness on screening uptake.
Study design: Cluster RCT
Quality score: +
External validity score: ++

Population and setting	
Source population Hostels in London **Eligible population** Hostels in London that met inclusion criteria **Selected population** Residents in hostels in London that were not on active TB treatment and had not had a chest x-ray within last 6 months. **Excluded population** Hostels excluded for various reasons, including high uptake rates, or didn't allow peers access to residents.	**Population characteristics (Intervention v Comparator)** Hostel sites with >50% uptake (12 v 15); hostels with <43 beds (12 v 13). **Setting** Hostels **Location** Urban – London
Methods of allocation to intervention/control	
Method of allocation Cluster randomised 46 of 59 hostels by minimisation, balancing on hostel size (≤43 beds), and previous screening uptake level (≤50%). Sites with a previous MXU uptake of >80% were excluded. **Method to minimise confounding** Poisson regression adjusted for size of hostel and previous screening uptake. Blinding was not possible. **Recruitment strategy** **Recruited :** Feb 2012 to October 2013 **Sample sizes:** **Total sample** N**=**46 hostels **Intervention** N=22 hostels (1150 eligible residents) **Comparator** N=24 hostels (1192 eligible residents) **Baseline comparisons** NA **Power of study** NR	**Intervention** Hostel staff encouraging MXU screening with the addition of peer educators with direct experience of TB and/or homelessness on screening uptake. Peers encouraged screening by speaking and contacting residents. **Comparator** Current practice of hostel staff encouraging MXU screening.
Outcomes and methods of analysis	
Outcomes Uptake in screening **Follow up period** NR	**Methods of analysis** An ITT analysis was undertaken on the proportion of eligible residents screened for TB, with interquartile ranges. Poisson regression was used to account for cluster design.
Service delivery results	
Screening uptake (diagnostic delay) **Poisson regression:** RR 0.98% (95% CI 0.80 to 1.20)	**Screening rate** **Overall:** 44% uptake (IQR 26,59) **Intervention:** 45% uptake (IQR 33,55)

	Control: 40% (IQR 25,61)
Notes and other information	
Author conclusions There was no evidence for peer educators increasing the uptake of MXU TB screening. **Author limitations** The lack of effect could be explained by a pragmatic study design where sites were not naïve to the intervention as peers had previously been involved in screening sessions at many hostels. **Evidence gaps and/or recommendations for future research and policy** NR **Source of funding** NIHR Programme Grant for Applied Research (RP-PG-0407–10340).	**Limitation identified by review team** Limited information from abstract. However, the authors noted that results were likely confounded by hostel sites in non-peer group being previously exposed to peers, which may have underestimated the effect of peers.

Anderson 2014

Authors: Anderson, C., White, J., Abubakar, I., Lipman, M., Tamne, S., et al#
Year: 2014 (online 2013)
Citation: Raising standards in UK TB control: introducing cohort review. Thorax, 69 (2) 187 - 189
Location: London, UK
Aim of study: To evaluate the effect of cohort review in a north London TB service.
Study design: Before and after study
Quality score: +
External validity score: ++

Population and setting

Source population
Persons with TB in London, UK.

Eligible population
Persons with TB receiving care at North Central London (NCL) TB Service.

Selected population
All patients notified as having TB disease by the five NCL TB clinics.

Excluded population
Cases notified during this time which were later found not to have TB.

Population characteristics (Intervention v Comparator)
Male: 54% v 44%; aged 20-39 years: 48.5% v 44.5%; non-UK born: 79% v 75.6%; recent migrant: 14.8% v 10.4% (p=0.038); long-term resident: 46% v 57.2% (p<0.001).

Setting
NCL TB Service.

Location
London, UK

Methods of allocation to intervention/control

Method of allocation
NA

Method to minimise confounding
NR

Recruitment strategy
NA

Sample sizes:
Total sample N=1309
Intervention N=752 (after cohort review)
Comparator N= 557 (before cohort review)

Baseline comparisons
NA

Power of study
NR

Intervention
Following implementation of cohort review (1st July 2010 to 31st December 2011). The cohort review (based on guidance provided by CDC and Prevention Division of Tuberculosis Elimination) is the multidisciplinary, systematic, quarterly appraisal of the case management and contact investigation of every TB. It provides a framework for service evaluation by focussing on specific outcomes, measured against local and national targets.

Comparator
Before cohort review (1st July 2009 to June 2010).

Outcomes and methods of analysis

Outcomes
Treatment completion, DOT, HIV testing, contact tracing.

Follow up period
NA

Methods of analysis
Proportions compared using chi squared tests or Fishers exact tests, with Bonferroni correction.

Service delivery results

Results – intervention (cohort review) v comparator (before cohort review)

All TB cases with contacts identified
At least 1 contact identified: 86% v 77%; p<0.001
At least 3 contact identified: 57% v 51%; p=0.024
At least 5 contacts identified: 30% v 29%; p=0.38

Pulmonary TB cases with contacts identified
At least 1 contact identified: 88% v 78%; p=0.001
At least 3 contact identified: 64% v 55%; p=0.01
At least 5 contacts identified: 37% v 33%; p=0.27

Other outcomes
Patients requiring DOT: 21% v 16%; p=0.049
Patients receiving DOT: 63% v 84%; p=0.003
Patients refusing DOT: 30% v 9%; p=0.001

Contacts assessed for all TB cases 81% v 74%; p<0.001 **Contacts assessed for pulmonary TB cases** 82% v 74%; p<0.001 **Treatment outcomes at 12 months** Treatment completion: 86% v 87%; p=0.6 Still on treatment: 6% v 4.2%; p=0.155 Died:2.7% v 4.4%; p=0.106 Lost to follow-up: 3.4% v 2.2%; p=0.201 Lost to follow-up overseas 2.2% v 0.7%; p=0.04	
Notes and other information	
Author conclusions Cohort review enables deficiencies to be addressed and rectified, which can lead to whole system improvement. **Author limitations** Subjective changes in the way staff assessed and managed patients may have occurred as a result of increased focus on process and outcome. **Evidence gaps and/or recommendations for future research and policy** TB services need to ensure cohort review is used appropriately, and its impact closely monitored. A fuller evaluation of the impact of cohort review across the UK is planned. **Source of funding** NR	**Limitation identified by review team** Confounding factors may also have influenced results.

This study was extracted in conjunction with two additional related papers:
Anderson, C., White, J., Dart, S., deKoningh, J., Hemming, S., & Abubakar, I. et al. 2010. Evaluation of Implementation of Cohort Review by North Central London TB Service. London, UK.
White, J., Anderson, C., Dart, S., Tamne, S., deKoningh, J., et al. 201. Simple Measures to Improve TB Control: Applying the Cohort Review Process in London. Thorax, 66(4):A92-A93. [abstract]

Bothamley 2007

Authors: Bothamley, G.H.[#]
Year: 2009
Citation: Audit of the Management of Tuberculosis at Homerton University Hospital NHS Foundation Trust, for patients notified in 2007 according to the NICE guidance, national British Thoracic Society guidelines and the London Service Framework for Tuberculosis.
Location: Homerton University Hospital, London, UK
Aim of study: The aim was to perform a retrospective audit of key TB outcomes at Homerton University Hospital compared to audits in previous years.
Study design: Retrospective audit
Quality score: Not addressed by CA
External validity score: Not addressed by CA

Population and setting	
Source population Persons with TB in London. **Eligible population** Persons receiving TB care at Homerton University Hospital. **Selected population** Persons receiving TB care at Homerton University Hospital in 2007. **Excluded population** NR	**Population characteristics (Intervention v Comparator)** NR **Setting** Homerton University Hospital, London in 2007. **Location** London, UK
Methods of allocation to intervention/control	
Method of allocation NA **Method to minimise confounding** NR **Recruitment strategy** NA **Sample sizes:** **Total sample** N**=** 155 patients in 2007 **Intervention** N= 155 patients in 2007 **Comparator** N= NR **Baseline comparisons** NA **Power of study** NR	**Intervention** A retrospective audit of TB patients treated at the Homerton University Hospital was undertaken based off patients seen in 2007. The audit was conducted according to NICE guidelines, BTS guidelines and the London Service Framework for Tuberculosis. **Comparator** Results compared to audits from the same hospital in 2006 and 2005.
Outcomes and methods of analysis	
Outcomes Diagnostic delay. Treatment completion. HIV testing. Hospital referral and admission. TB outcomes. Smear positive and culture positive laboratory results. **Follow up period** NR	**Methods of analysis** Proportions.
Service delivery results	
Diagnostic delay Proportion sputum results available within a day: 2007: **Confidential information removed** 2006: **Confidential information removed** 2005: **Confidential information removed** **Treatment completion** Number patients cured or completing treatment: **Confidential**	**Other results** **HIV testing** Test discussed for **Confidential information removed** **Attrition details** **Confidential information removed**

information removed	
Notes and other information	
Author conclusions Authors concluded that audit criteria were achieved for 100% patients. **Author limitations** NR **Evidence gaps and/or recommendations for future research and policy** DOT patients show gaps in treatment which require separate documentation. **Source of funding** NR	**Limitation identified by review team** Results are reported as patient numbers without denominators. Furthermore, the sample sizes and numbers of patients reported do not add up. Therefore the review team is unable to account for the number of patients analysed in the present study.

#Extracted with linked study B168 SLA 2013 – however no data available to extract from link paper as review team unable to account for proportions and sample sizes reported. This paper was received in confidence; as such data has been removed.

Griffiths 2007

Authors: Griffiths, C., Sturdy, P., Brewin, P., Bothamley, G., et al.
Year: 2007
Citation: Educational outreach to promote screening for tuberculosis in primary care: a cluster randomised controlled trial. The Lancet, 369(9572), 1528-34.
Location: London, UK
Aim of study: The trial was undertaken to evaluate the effectiveness of a TB screening programme in a London Primary Care Trust (PCT) which screened patients at time of PCT registration.
Study design: Pragmatic cluster randomised controlled trial
Quality score: ++
External validity score: ++

Population and setting

Source population
Persons in London.

Eligible population
Persons registering as new patients at general practices in the City and Hackney Teaching Primary Care Trust (PCT).

Selected population
Persons registered with the participating general practices during 1 June, 2002 – 1 October, 2004.

Excluded population
Three PCTs in Hackney were not included in the cluster randomisation – one was ineligible as it was used as a pilot practice for the present study and two declined to participate.

Patients were excluded if de-notified.

Population characteristics (Intervention v Comparator)
Median number new patients per practice: 1,546 v 1,573; mean age: 29 v 26; male: 47% (21,143/44,986) v 46% (22,533/48,984); white: 45% (20,244/44,986) v 42% (20,573); black: 22% (9,897/44,986) v 24% (11,756/48,984); south Asian: 9% (4,049/44,986) v 10% (4,898/48,984); mean number new immigrant patients per practice: 248 v 272.

Setting
General practice.
Location
Hackney, London, UK

Methods of allocation to intervention/control

Method of allocation
General practices were randomised to intervention and comparator groups with a computer minimisation program (Minim Version 1.3).

Method to minimise confounding
Minimisation criteria for randomisation included the number of partners in the general practice, employment of practice nurse, approval for training of general practitioners, use of EMIS practice computer system, whether surgery registered new patients, rate of registration checks in new patients, and participation in local scheme to promote registration of asylum seekers.

The definition of a TB case was specified at the start of the study and applied independently to participants' medical records by two researchers blinded to practice allocation with arbitration of any differences by a third researcher who was blinded to allocation.

Identification route, clinical data, and patient demographics were entered blind into the study database.

Recruitment strategy
To achieve maximum power the researchers aimed to recruit for 25 months.

Sample sizes:
Total sample N**=** 93,970 new patients; 46,624 attended registration health check
Intervention N= 44,968 new patients; 23,573 attended registration health check
Comparator N= 48,984 new patients; 23,051 attended registration health check

Intervention
Patients at the general practices randomised to the intervention group received TB screening at their PCT registration health check. The intervention entailed a specialist TB nurse and academic GP making an educational outreach visit to each intervention practice to promote TB screening and raise TB awareness. They distributed screening guidelines. Prompts were included into the practice computer system for registration health checks to remind clinicians to ask the screening questions. Equipment for TST was provided. Telephone support from a specialist TB nurse was available. A financial incentive of £7 was paid to the practice for each TST administered.

Comparator
Patients at general practices randomised to the control group received usual care. These general practices received no contact. Some practices in the control group had already been administering TST and continued to do so.

Baseline comparisons In the year prior to the study period, 150 active TB cases were identified in Hackney, of which 55% (83/150) were referred by or diagnosed in general practice. This detection rate was assumed to be the same for the control group. **Power of study** To detect a clinically significant increase of 20% (thus an increase in diagnosis rate from 55% at baseline to 75%) with 80% power at the 5% significance level, a total of 280 active TB cases were needed during the study period.	
Outcomes and methods of analysis	
Outcomes Proportion new cases of active TB identified (primary outcome). Proportion new cases of latent TB identified. Persons aged 5 and older receiving BCG immunisation. Percentage new registrations screened for TB. Numbers of TST undertaken. **Follow up period** NR	**Methods of analysis** Intention-to-treat analyses using generalised estimation equations with a logit link to account for clustering were used to calculate Tb cases. Poisson regression was used for tubulin skin tests and BCG coverage.
Service delivery results (intervention v comparator)	
Proportion new patients attending registration health check 52% (23,573/44,986) v 47% (23,051/48,984) **Proportion patients screened for TB at registration health check:** 57% (13,478/23,573) v 0.4% (84/23,051) **TST undertaken** 8.5% (1996/23,573) v 0.4% (84/23,051) **BCG coverage** Rate: 26.8 per 1000 v 3.8 per 1000 Rate ratio: 9.52 (95% CI 4.0 – 22.7; p<0.001)	**Active TB Diagnosis** 47% (66/141) v 34% (54/157) OR:1.68 (95% CI1.05 – 2.68; p=0.03) **Latent TB Diagnosis** 19% (11/58) v 9% (5/68) OR: 3.00 (95% CI 0.98 – 9.20; p=0.055) **Attrition details** None, as all practices in cluster randomisation were included in analyses.
Notes and other information	
Author conclusions The educational outreach intervention promoting TB screening and health registration checks improved diagnosis of active and latent TB, thus improving active case finding. It also increased BCG coverage almost seven times. Screening identified more than a third of the extra active TB cases diagnosed in primary care. The authors also suggest the intervention was mediated by promotion of screening and raising clinicians' awareness of TB. **Author limitations** The study was limited in that they were able to measure the proportion of cases identified rather than changes in identification rate. This measurement would have required a much larger sample size. **Evidence gaps and/or recommendations for future research and policy** Future research should test more effective ways to detect latent TB, perhaps using serological immunodiagnostic tests. More evidence is also needed to show effectiveness and cost-effectiveness of screening method, site, and target population. **Source of funding** UK Department of Health, Primary Care Studies Programme and Ad Hoc Funding	**Limitation identified by review team** As noted by the researchers, participants and practitioners may have been aware of which group they were allocated to as it was not possible to blind them to the presence or lack of a new TB screening programme.

Hall 2010

Authors: Hall J, Bethell S, Hellern S et al.
Year: 2010
Citation: Evaluation of TB Peer Educators – Essential Partners in Metropolitan TB Control. Thorax 65(4)
Location: London, UK
Aim of study: To improve service access and uptake of TB screening among hard-to-reach groups
Study design: Before and after
Quality score: -
External validity score: +

Population and setting	
Source population People with TB in London, UK **Eligible population** TB cases presenting at clinics and x-ray screening service **Selected population** Hard-to-reach groups. **Excluded population** NR	**Population characteristics (Intervention v Comparator)** NR **Setting** Community **Location** Urban – London
Methods of allocation to intervention/control	
Method of allocation NR **Method to minimise confounding** NR **Recruitment strategy** **Recruited :** May 2009-February 2010 **Sample sizes:** **Total sample** N=7 peer educators **Intervention** N=7 peer educators **Comparator** N=NR (presumably 0 peer educators) **Baseline comparisons** NA **Power of study** NR	**Intervention** Former TB patients with a history of homelessness and drug/alcohol dependence were trained as peer educators to work alongside mobile screening units and TB service. **Comparator** Presumably before the introduction of peer educators but no detail provided
Outcomes and methods of analysis	
Outcomes Uptake in screening **Follow up period** NR	**Methods of analysis** NR
Service delivery results	
Screening uptake (diagnostic delay) **Following TB peer educator training of homeless shelter hostel workers :** 75% **Pre (presumably before peer educators): 44%** (p value not reported)	**Other results** Peers recruited 3200 hard-to-reach clients at 101 screening sessions resulting in 45 hospital referrals. Interviews with service users highlighted importance of peer educators in raising TB awareness and promoting service access.
Notes and other information	
Author conclusions Trained peer educators can improve service access and TB screening uptake in the short and medium term in hard-to-reach groups. **Author limitations**	**Limitation identified by review team** Limited information from abstract.

NR **Evidence gaps and/or recommendations for future research and policy** The authors recommend greater peer educator involvement in strategies to control TB in metropolitan areas. **Source of funding** Department of Health	

Hayward, 2010

Authors: Hayward, J., Murray, D., Iny, I., Jarrett, J., Lonergan, K., Pillas, D., & Seager, S.
Year: 2010
Citation: London TB Service Review and Health Needs Assessment. Public Health Action Support Team (PHAST) Final Project Report.
Location: London, UK
Aim of study: Aim was to assess performance of five sector-wide clinical networks against local standards across London.
Study design: Local report
Quality score: Not addressed by CA
External validity score: Not addressed by CA

Population and setting

Source population
Persons with TB in London.

Eligible population
Persons with TB reporting to one of 30 TB services in London for care.

Selected population
29 TB services in London were identified and sent survey questionnaire and were included in review. The services were in five sectors: North Central London, North East London, North West London, South East London, and South West London.

Excluded population
Queen Mary's Sidcup hospital no longer runs a TB service clinic (service provided by Greenwich), and so was not included in service review.

Population characteristics (proportion various groups account for TB cases reported by questionnaires)
UK-born persons: 15%; black African: 28%; Indian: 27%; White: 17%; pulmonary TB: 49%; aged 15-44: 65%; <16 years old: 5%; alcohol use: 7%; mental health issues: 5%; drug use: 4%; homelessness: 3%; resistant to Isoniazid: 10%; multi-drug resistant: 2.2%

These proportions are not uniform across all five sectors of London.

Only one case was XDR-TB was reported; proportion not calculated.

Setting
TB service clinics around London providing outpatient and inpatient services in 2009.

Location
London, UK

Methods of allocation to intervention/control

Method of allocation
NA

Method to minimise confounding
NA

Recruitment strategy
29 TB services around London were identified through the scoping process of the present review. No further detail provided on recruitment.

Sample sizes:
Total sample N**=** 29 TB services
Intervention N= NA
Comparator N= NA

Baseline comparisons
Some comparisons made for TB rate between years 2009 and previous years. Some comparisons made for financial expenditures between fiscal year 2010-2011 and year 2009-2010.

Power of study
NA

Intervention
Current practice in the different TB services across London. A survey questionnaire was mailed to named contacts (usually lead TB nurse) at each clinic to gather detail on service use; all 29 services responded.

Comparator
NA

Outcomes and methods of analysis

Outcomes
Diagnostic delay (also referred to as "prompt diagnosis"). Treatment completion. Contact tracing. DOT use.

Methods of analysis
Proportions.

Follow up period NA	
Service delivery results	
Diagnostic delay (referred to as prompt diagnosis) Prompt diagnosis was reported in two metrics: TB samples processed with liquid culture technology and all sputum smears should be available within one working day of sample reaching laboratory. 29/29 services reported prompt return of sputum smear results were in place. 29/29 services reported use of liquid cultures. **Treatment completion** Percent notifications completing treatment within one year in 2008 - North Central: 80.0% (456 persons completed treatment) North East: 84.0% (761 persons) North West: 81.6% (929 persons) South East: 85.1% (430 persons) South West: 82.8% (308 persons) London Total: 82.6% (2888 persons) Clinic rates ranged from 61.1% (West Middlesex: 66 persons) – 94.6% (Whipps Cross: 122 persons) **Contact tracing** Services reported following NICE guidelines for contact tracing (actual number of services reporting this NR). However, as there is no standardised protocol for reporting this, services report they do not have the ability to measure contact tracing as an indicator of service performance.	**Other results** **DOT use during 2009** Overall London: 8.5% (304/3571 notifications) Range: 0% (Bromley) – 31.8% (Mayday) Details on service structure, staffing ratios, and service settings noted in case study background, but not within the full extraction. **Attrition details** Individual services: In 2008, cases lost to follow-up ranged from 1 case in Newham to 9 lost in Northwick Park and West Middlesex. Sectors: In 2008, ranged from 1.1% (10) notified cases in NE London to 3.2% (35) notified cases in NW London.
Notes and other information	
Author conclusions London needs to be brought under improved control using a London-wide structure for leadership and decision-making. A manual of TB pathways and protocols for London is needed (based on the New York equivalent). **Author limitations** The present review was a pragmatic survey with the purpose of making broad comparisons and conclusions about London TB services within a limited about of time. Thus detailed information is limited and often incomplete. Due to the self-reported nature of data provided, the information is subject to bias. **Evidence gaps and/or recommendations for future research and policy** A number of recommendations were made including the setting up of a TB control board, standardisation of clinical policy and practice, and specific performance metrics. **Source of funding** Commissioned by the London TB Commissioning Board	**Limitation identified by review team** Review was conducted prior to restructure of NHS and thus may not reflect structures of current TB services. Review is limited to London and may not be generalisable to service structure, service delivery, and TB population in other parts of UK.

Jit 2011

Authors: Jit, M., Stagg, H.R., Aldridge, R.W., White, P.J., & Abubakar, I.
Year: 2011
Citation: Dedicated outreach service for hard to reach patients with tuberculosis in London: observational study and economic evaluation. BMJ, 343.
Location: London, UK
Aim of study: Overall aim was to determine cost effectiveness of the Find and Treat service. The economic data has previously been extracted. This extraction is of the clinical data from a retrospective cohort which was used to inform the compartmental model.
Study design: Economic evaluation alongside a cohort study
Quality score: ++ (economic evaluation checklist)
External validity score: ++ (economic evaluation checklist)

Population and setting

Source population
Persons with TB in London.

Eligible population
Persons with active TB who were targeted by the Find and Treat service for being in a hard to reach group. Hard to reach groups defined as persons in drug treatment services, and hostels or day centres for homeless and impoverished people.

Selected population
Persons with records in the Find and Treat database between September 2007 and September 2010.

Excluded population
Persons with non-pulmonary TB as this wouldn't be detected by chest x-ray.

Population characteristics (Intervention v Comparator)
NR

Setting
Community, including hostels, homeless shelters and day centres

Location
London, UK

Methods of allocation to intervention/control

Method of allocation
NA

Method to minimise confounding
Comparators were age matched with persons detected by Find and Treat services and had one or more risk factors. Risk factors included history of homelessness or imprisonment, drug or alcohol abuse, or mental health issues.

Recruitment strategy
NA

Sample sizes:
Total sample N**=** 668
Intervention N= 416 (48 identified by mobile screening unit, 188 cases referred for case management support, 180 cases referred for loss to follow-up)
Comparator N= 252

Baseline comparisons
NA

Power of study
NR

Intervention
Mobile radiography unit was set up to screen vulnerable populations on a voluntary basis. Purpose of this Find and Treat service was to screen and find active cases, raise awareness, undertake case holding, and support treatment completion for the hard to reach groups.

Collaborated with drug and alcohol support services, hostels, and street outreach and criminal justice services to find vulnerable persons.

Comparator
Persons with TB in London who presented to London TB services on their own without screening or referral (i.e. passively presented cases), and whose treatment records were in London's enhanced tuberculosis surveillance system.

Outcomes and methods of analysis

Outcomes
Treatment completion. Loss to follow-up. Diagnostic delay.

Follow up period
NA

Methods of analysis
Proportions for clinical data. Economic evaluation used a discrete, multiple age cohort, compartmental model.

Service delivery results

Treatment completion (intervention v comparator) Previously untreated cases referred for treatment after screening- If in first year of treatment: 54.6% v 46.2% If in subsequent year of treatment: 67.1% v 56.8% Cases referred to Find and Treat service for case management support due to complex issues: 61.2% v 51.7% Cases under treatment referred to Find and Treat service because of loss to follow-up: 41.0% v 40.8% **Diagnostic delay** Estimated proportion of patients with the longest delays between symptom onset and treatment presentation found by Find and Treat service who likely would not have presented for treatment otherwise: 22.9%	**Other results** Economic results presented in economic extraction sheet. **Attrition details – intervention v comparator** Lost to follow-up after one year in previously untreated cases: 2.1% v 17.2% Lost to follow-up after one year in complex patients: 2.6% v 34.7%
Notes and other information	
Author conclusions Find and treat is cost-effective. **Author limitations** The model used was based on patients with at least one risk factor in London's enhanced tuberculosis surveillance system who presented for care. However, the Find and Treat service often manages hard to reach patients who would not present for care in the absence of the service. Due to the lack of randomisation between cases managed and not managed by the Find and Treat service there some uncertainty about the robustness of the outcomes, which may have underestimated the benefit of the service. **Evidence gaps and/or recommendations for future research and policy** The authors recommend study use of "point of care testing" within community outreach settings, such as with the mobile x-ray unit. They also recommend a randomised trial evaluate patients who are and are not managed by the Find and Treat service to confirm estimates of the service's benefits. **Source of funding** English Department of Health	**Limitation identified by review team** Methods of study were focused on modelling cost effectiveness of the service rather than measuring the outcomes and benefits of the service itself. In addition, the service was used among hard to reach groups in London and may not be generalisable to other populations.

London Health Programmes 2011

Authors: NHS publication[#]
Year: 2011
Citation: Case for change: TB services in London. London Health Programmes. NHS.
Location: London, UK
Aim of study: Aim of report was to describe specific problems with the way TB services in London were planned, organised and managed. For the purpose of the present review results on treatment completion were extracted.
Study design: Local report
Quality score: Not addressed by CA
External validity score: Not addressed by CA

Population and setting

Source population
Persons with TB in London.

Eligible population
Persons with TB receiving care from services within the five Primary Care Trusts (PCTs) within London.

Selected population
Persons receiving TB care from London PCTs during 2010.

Excluded population
NR

Population characteristics (Intervention v Comparator)
NR

Setting
TB services within PCTs in London during 2010.

Location
London, UK

Methods of allocation to intervention/control

Method of allocation
NA

Method to minimise confounding
NA

Recruitment strategy
NA

Sample sizes:
Total sample N**=** 3,302 new TB cases in London in 2010; sample size from treatment completion results NR.
Intervention N= NA
Comparator N= NA

Baseline comparisons
NA

Power of study
NR

Intervention
Current practice in different TB services across London PCTs in 2010. NR how data for treatment completion results were collected.

Comparator
Treatment completion compared to 85% completion target set by Chief Medical Officer for England, which is based on the WHO target.

Outcomes and methods of analysis

Outcomes
Treatment completion.

Follow up period
NR

Methods of analysis
Proportions.

Service delivery results

Treatment completion
Proportion new TB notifications among London residents completing treatment within one year of notification in 2010:
South East: 88.9%
North Central: 87.6%
South West: 86.9%
North West: 86.7%
North East: 85.1%

Other results
NA

Attrition details
NR

London total: 86.6% Treatment completion rates fell below 85% in: Camden, Islington, City & Hackney, Havering, Redbridge, Tower Hamlets, Hammersmith & Fulham, Hillingdon, Hounslow, Bromley, Kingston, and Richmond & Twickenham. Treatment completion rates were lowest in Tower Hamlets (79%).	
Notes and other information	
Author conclusions Although the London proportion of new TB cases successfully completing treatment was slightly above the target of 85%, rates varied across PCTs with several scoring below the target. **Author limitations** NR **Evidence gaps and/or recommendations for future research and policy** A number of recommendations were set out in a separate report (Model of Care for London) around: early detection and diagnosis of treatment; improving commissioning; and addressing variability in practice. **Source of funding** NR	**Limitation identified by review team** The reasons for differences in treatment completion rates across London were not fully discussed.

Linked to model of care also, but no additional results for extraction.

Story 2009

Authors: Story, A., Windish, P., Hall, J.et al.
Year: 2009
Citation: "Find & Treat": Returning the Lost Back to Local Tuberculosis Services. Thorax, 64(Suppl IV), A104.
Location: London, UK
Aim of study: The aim was to describe practical steps taken by a Find & Treat service to return hard-to-reach TB patients to TB services in London.
Study design: Local report
Quality score: Not addressed by CA
External validity score: Not addressed by CA

Population and setting	
Source population Persons with TB in London. **Eligible population** Hard-to-reach persons with active TB in London who had disengaged prior to treatment completion and lost to follow-up. **Selected population** Hard-to-reach active TB cases in London which have been referred to the Find & Treat service by other TB services since October 2007. **Excluded population** NR	**Population characteristics** Of 133 hard-to-reach active cases who were referred to Find & Treat service: Men: 74%; UK-born: 34%; pulmonary TB: 77%; pulmonary TB sputum smear positive: 55%; culture confirmed: 66%; drug-resistant: 15%; smear positive drug resistant: 12%; receiving DOT from treatment onset: 38%. **Setting** Community **Location** London, UK
Methods of allocation to intervention/control	
Method of allocation NA **Method to minimise confounding** NA **Recruitment strategy** NA **Sample sizes:** **Total sample** N**=** 133 cases referred to F&T **Intervention** N= NA **Comparator** N= NA **Baseline comparisons** NA **Power of study** NA	**Intervention** The F&T service was introduced to find hard-to-reach TB patients who had been lost to follow-up and return them to TB services for care. **Comparator** NA
Outcomes and methods of analysis	
Outcomes Treatment completion. Cases returned to treatment following referral to F&T. Outcomes of cases referred to F&T. **Follow up period** NA	**Methods of analysis** Proportions.
Service delivery results	
Proportion cases referred to F&T service who were returned to treatment services: Overall: 67% (89/133) Drug-resistant: 8.9% (10/89)	**Other outcomes of cases referred to F&T service:** Still were on treatment: 33% (29/89) Died of TB: 6% (5/89) Transferred out: 7% (6/89) Treatment stopped by clinicians as case considered too

Treatment completion Of cases referred to F&T service: 38% (34/89)	socially chaotic to treat: 17% (15/89) **Attrition details** NR
Notes and other information	
Author conclusions It is possible to find and return hard-to-reach TB patients to treatment services. This service can impact public health outcomes for patients lost to follow-up. **Author limitations** NR **Evidence gaps and/or recommendations for future research and policy** NR **Source of funding** NR	**Limitation identified by review team** The present article is an abstract and thus provides limited information on the F&T service and demographics of hard-to-reach persons found by the service.

UK Non-London urban (5 studies)

Browne 2013

Authors: Browne, C., Munang, M.L., Evans, J.S., Smith, E.G., Khanom, S., Hawkey, P., Kunst, H., Welch, S., & Dedicoat, M.
Year: 2013
Citation: Impact of TB Cluster Investigation in a New Migrant Community. Thorax, 68(Suppl 3), A119.
Location: High incidence area, UK
Aim of study: The aim was to identify whether a social network cluster investigation could identify whether recent TB transmission had occurred within a new migrant community.
Study design: Local report
Quality score: Not addressed by CA
External validity score: Not addressed by CA

Population and setting

Source population
Persons with TB in a high incidence area, UK. (Possibly limited to Birmingham but not clear)

Eligible population
Persons with TB originating from a single country in a new migrant community in a high incidence area.

Selected population
Persons with TB originating from a single country residing in a high incidence area from 2009-2012.

Excluded population
NR

Population characteristics (Intervention v Comparator)
Median number of years in UK: 4

Setting
Private homes and places of worship in a new migrant community in a high incidence area, UK.

Location
Urban - high incidence area , UK.(Possibly limited to Birmingham)

Methods of allocation to intervention/control

Method of allocation
NA

Method to minimise confounding
NR

Recruitment strategy
NA

Sample sizes:
Total sample N**=** 66 occurred between 2009-2012
Intervention N= 56 of 66 cases interviewed
Comparator N= NA

Baseline comparisons
NA

Power of study
NR

Intervention
Following clinicians and nurses identifying a sharp increase in TB cases originating from a single country, a social network approach to cluster investigation was undertaken to identify whether recent transmission had occurred. The team undertook interviews in private homes, performed MIRU-VNTRs strain typing*.

Comparator
NA

Outcomes and methods of analysis

Outcomes
Contact tracing. Treatment completion. Epidemiological links. MIRU-VNTRs strain typing*. Screening completion.

Follow up period
NA

Methods of analysis
Proportions. Interquartile range.

Service delivery results

Contact tracing
Interviewed in homes: 85% (56/66)
Epidemiologically linked to index case[#]: 23
MIRU-VNTRs* strain typing available: 79% (19/24)
Additional contacts self-identified for screening: 77
Of these patients, 77% (59/77) completed screening.

Other results
As a result of the cluster investigation the Tb service were invited to speak at a religious service and two community members became involved in raising awareness.

Attrition details
NR

Treatment completion LTBI cases treated: 16 BCG vaccinations administered: 7 Undergoing assessment: 13	
Notes and other information	
Author conclusions The social network cluster investigation built trust within the new migrant community to allow access to TB services. The community has an increased awareness of TB which will reduce diagnostic delays in the future. **Author limitations** NR **Evidence gaps and/or recommendations for future research and policy** NR **Source of funding** NR	**Limitation identified by review team** The present article is an abstract and thus provides limited detail on the intervention implemented and population demographics.

Index case was a prominent community member who had been symptomatic for 10 months.
* MIRU-VNTRs: 24 loci mycobacterial interspersed repetitive unit-variable number tandem repeats strain typing. 12 cases had identical strain type to index case.

King 2009

Authors: King, R., Carter, M.J., Mungall, S.B., & Hetzel, M.R.
Year: 2009
Citation: Does a Specialist TB Nurse Service Improve Outcome? Thorax, 64(Suppl IV), A121-122
Location: Bristol, UK - Urban
Aim of study: The aim of the study was to retrospectively evaluate whether two community-based TB nurses could improve treatment compliance and improve cost-effectiveness compared to the former hospital-based clinic system.
Study design: Before and after study
Quality score:+
External validity score: ++

Population and setting

Source population Persons with TB in Bristol, UK. **Eligible population** Persons with TB **Selected population** Persons referred to TB **Excluded population** Persons with TB partially treated prior to referral, given chemoprophylaxis, changed diagnosis or died within first month of treatment.	**Population characteristics (Intervention v Comparator)** NR **Setting** Retrospective evaluation of case records of TB patients referred to two community-based TB nurses in Bristol. **Location** Bristol, UK.

Methods of allocation to intervention/control

Method of allocation NA **Method to minimise confounding** NR **Recruitment strategy** NA **Sample sizes:** **Total sample** N**=** 147 **Intervention** N= 64 (64 of 117 referred patients suitable for audit) **Comparator 1** N= 22 **Comparator 2** N= 61 **Baseline comparisons** NR **Power of study** NR	**Intervention** Two community-based TB nurses were appointed by the Bristol primary care trust (PCT) to improve treatment compliance among patients with TB and cost-effectiveness. **Comparator 1 – "2006a"** Audit of the previous hospital-based system of monthly clinics during 31 August 2005 – 28 February 2006. **Comparator 2 – "2006b"** Information from cases notified to the Health Protection Agency in 2006.

Outcomes and methods of analysis

Outcomes Treatment completion. Proportion patients given TB nurses' contact details within two days. Face-to-face and telephone contacts undertaken by TB nurses.. HIV counselling. Assessed for DOT. Uninterrupted medication. Monthly reviews. Mean proportion clinic or community reviews not attended. Financial data from April 2008 – March 2009 also	**Methods of analysis** Proportions. Fisher exact test. Student *t* test.

presented for cost-effectiveness analysis of service compared to previous hospital-based system.[#] **Follow up period** NA	
Service delivery results	
Treatment completion 2008: 94% (56/59) 2006a: 84% (16/19) 2006b: 55% (32/58) (*p*<0.0001) **Uninterrupted medication**: 2008: 92% (59/64) 2006a: 15% (3/20) 2006b: - (*p*<0.0001) **Assessed for requiring DOT**: 2008: 92% (59/64) 2006a: 5% (1/22) 2006b: - (*p*<.00001)	**Proportion patients given TB nurses' contact details within two days**: 97% (62/64) **Face-to-face and telephone contacts undertaken by TB nurses**: Total: 771 Mean contacts per patient : 15 **Counselling regarding HIV in first month:** 2008: 69% (44/64) 2006a: 32% (7/22) 2006b: - (*p*<0.005) **Attrition details** NR
Notes and other information	
Author conclusions The TB nurse service introduced led to statistically significant improvement in all standards audited. Thus, the service provides better care than previous hospital-based clinics and improved attendance. **Author limitations** NR **Evidence gaps and/or recommendations for future research and policy** NR **Source of funding** NR	**Limitation identified by review team** As the paper is an abstract limited information is provided for population demographics and the intervention implemented.

This study was also included in the economics review - see economics review for further details of the economic component of this study.

Lynch 2013

Authors: Lynch, C.A., Sabah, S., Dedicoat, M., & Kunst, H.
Year: 2013
Citation: Does a Direct Radiology Referral System to a Rapid Access Tuberculosis Clinic Improve TB Diagnosis? Thorax, 68(Suppl 3), A86.
Location: UK - Urban
Aim of study: The aim of the study was to evaluate whether referral of patients with chest radiographs suggestive of pulmonary TB to a rapid access TB clinic could reduce diagnostic delay.
Study design: Retrospective cohort study
Quality score: +
External validity score: +

Population and setting	
Source population Persons with TB in Centre of England. **Eligible population** TB patients with features of active TB on chest radiograph referred to a rapid access TB clinic at a centre of England tertiary referral centre. **Selected population** Eligible persons referred to the rapid access TB clinic from November 2008 – May 2013. **Excluded population** NR	**Population characteristics** Diagnosed with active TB: 50% (111/223); mean age: 38 years (range 16-83); male: 56% (62/111); from Indian subcontinent: 55% (61/111); from Africa: 19% (22/111); UK-born: 22% (25/111); from other countries: 1% (3/111); pulmonary TB: 72% (80/111); smear positive pulmonary TB cases: 59% (47/111); extra-pulmonary TB cases: 25% (28/111); drug sensitive cases: 93% (103/111); drug-resistant cases: 7% (8/111) **Setting** A rapid access TB clinic at a centre of England tertiary referral centre from November 2008 – May 2013. **Location:** Centre of England
Methods of allocation to intervention/control	
Method of allocation: NA **Method to minimise confounding:** NR **Recruitment strategy:** NA **Sample sizes:** **Total sample** N**=** 223 cases referred to rapid access TB clinic **Intervention** N=223 cases referred to rapid access TB clinic (111 diagnosed with active TB) **Comparator** N= NA **Baseline comparisons:** NA **Power of stud:** NR	**Intervention** Referral to a rapid access TB clinic between November 2008 and May 2013. Chest radiographs were reviewed by TB consultants who arranged clinic appointments according to degree of suspicion of active TB. **Comparator** NA
Outcomes and methods of analysis	
Outcomes Diagnostic delay: Days from referral to clinic review. Days from referral to rapid access TB clinic and starting treatment. **Follow up period** NR	**Methods of analysis** Proportions.
Service delivery results	
Overall: Cases seen within 14 days of rapid access radiology referral: 92% (102/111) Cases started on anti-TB treatment within 28 days radiology referral: 72% (80/111) **Days from radiology referral to rapid access TB clinic and clinic review:** Smear positive pulmonary TB (47/111): Admitted: 2	**Days from radiology referral to rapid access TB clinic and starting anti-TB treatment:** Smear positive pulmonary TB (47/111): Admitted:2 < 5 days: 13 5-14 days: 23 14-28 days: 5 > 28 days: 4 Culture positive pulmonary TB (33/111):

< 5 days: 14 5-14 days: 28 > 14 days: 3 Culture positive pulmonary TB (33/111): Admitted: 4 < 5 days: 10 5-14 days: 16 > 14 days: 3 Extrapulmonary TB(31/111): Admitted: 2 < 5 days: 8 5-14 days: 18 > 14 days: 3	Admitted: 4 < 5 days: 0 5-14 days: 8 14-28 days:9 > 28 days: 12 Extrapulmonary TB (31/111): Admitted: 2 < 5 days: 5 5-14 days: 5 14-28 days: 4 > 28 days: 15 **Attrition details** Four TB patients referred to the rapid access TB clinic did not attend.
Notes and other information	
Author conclusions Direct radiology referral with chest radiographs suggestive of pulmonary TB to rapid access TB clinic reduced diagnostic delay of active TB. **Author limitations** NR **Evidence gaps and/or recommendations for future research and policy** NICE guidance should include recommendation to directly refer TB patients with chest radiographs suggestive of pulmonary TB to a rapid access TB clinic to reduce diagnostic delay. **Source of funding** NR	**Limitation identified by review team** The present article is an abstract and thus provides limited detail on the intervention implemented and population demographics.

Monk 2014

Authors: Monk, P.
Year: 2014
Citation: "Tuberculosis in Leicestershire". Annual TB Update 2014. Public Health England. P.6
Location: Leicestershire, UK
Aim of study: The aim was to assess whether a rapid access service for patients with suspicious x-rays and positive microbiology could reduce diagnostic delay and the overall burden of TB in Leicester.
Study design: Regional report
Quality score: Not addressed by CA
External validity score: Not addressed by CA

Population and setting

Source population Persons with suspected TB in Leicestershire, UK. **Eligible population** Persons with suspected TB in Leicestershire, UK. **Selected population** Persons with suspected TB in Leicestershire, UK. **Excluded population** NR	**Population characteristics (Intervention v Comparator)** NR **Setting** Services providing TB care in Leicestershire. **Location** Leicestershire, UK.

Methods of allocation to intervention/control

Method of allocation NA **Method to minimise confounding** NA **Recruitment strategy** NA **Sample sizes:** **Total sample** N**=** NR **Intervention** N= NR **Comparator** N= NA **Baseline comparisons** NA **Power of study** NR	**Intervention** In 2005 a rapid access service (modelled on approach for lung cancer) was established to enable GPs to rapidly assess patients with suspected TB. This was done by linking radiology and microbiology to the TB service so patients with suspicious x-rays and positive microbiology would be offered next day appointments. **Comparator** A comparison was made over time, with data on outcomes available from 2001 onwards before the introduction of rapid access service.

Outcomes and methods of analysis

Outcomes Annual number of TB cases in Leicestershire. Number of TB cases broken down by TB type (non-pulmonary, pulmonary smear positive and pulmonary smear negative) and by culture results (positive and negative). **Follow up period** NA	**Methods of analysis** NR

Service delivery results

TB cases per year in Leicestershire: 2001: 340 2002: 257 2003: 284 2004: 237 2005: 308 --> Year rapid access service introduced 2006: 275 2007: 270 2008: 242 2009: 255 2010: 251	**Other results** The number of TB cases from 2005-2013 by TB type (non-pulmonary, pulmonary smear positive and pulmonary smear negative) and by culture results (positive and negative) are presented on a bar graph. However, the numbers of cases cannot be extracted. **Attrition details** NR

2011: 223 2012: 224 2013: 196	
Notes and other information	
Author conclusions The introduction of a rapid access service and establishment of a TB Board for Leicester has impacted on the smear positive cases, reducing the burden of infection and reducing the overall number of TB cases. **Author limitations** NR **Evidence gaps and/or recommendations for future research and policy** NR **Source of funding** NR	**Limitation identified by review team** The present article is a small part of a larger TB report and provides very limited data on the intervention implemented. No data is provided on the number of patients who used this service or their specific outcomes. It also is not clear if any other changes to TB services or the rate of TB in Leicestershire occurred during the study period which may have accounted for some of the changes in TB cases.

Verma 2011

Authors: Verma R, Lee J, Halder P, and Woltmann G. P54 Impact of rapid access system for the early referral of suspected TB cases. Thorax 66: A90.
Year: 2011
Citation: Impact of rapid access system for the early referral of suspected TB cases. Thorax 66: A90.
Location: UK - Urban
Aim of study: The aim of the study was to evaluate whether differences exist in disease characteristics and time to diagnosis with the rapid referral system, compared with other diagnostic pathways.
Study design: Retrospective cohort study
Quality score: +
External validity score: +

Population and setting	
Source population Persons with TB in Leicester **Eligible population** Patients referred to rapid access TB clinic with TB in Leicester between 2005 and 2010 **Selected population** Patients diagnosed with TB between 2007 and 2009 **Excluded population** NR	**Population characteristics (intervention v comparator)** Mean age: 36.4 v 41.6 years (p>0.05); male: 54% v 51% (p>0.05); from Indian subcontinent: 191 v 226 (p>0.05); pulmonary smear positive TB: 32 v 35 (p>0.05); pulmonary smear negative TB: 41.6 v 16.2 (p0.03); non-pulmonary TB: 26 v 48 (p0.04). **Setting** Health service **Location:** Leicester, UK
Methods of allocation to intervention/control	
Method of allocation: NA **Method to minimise confounding:** NR **Recruitment strategy:** NA **Sample sizes:** **Total sample** N**=** 588TB patients **Intervention** N=288 **Comparator** N= 300 **Baseline comparisons:** NA **Power of stud:** NR	**Intervention** Rapid access which is triggered by appropriate coding of abnormal chest x-rays by the reporting radiologist and/or a list of red flag symptoms on a proforma **Comparator** 'Other diagnostic pathways'
Outcomes and methods of analysis	
Outcomes Diagnostic delay Contact tracing **Follow up period** NR	**Methods of analysis** Chi squared test
Service delivery results (intervention v comparator)	
Diagnostic delay Average duration of symptoms smear positive pulmonary TB (days) 60.2 v 95.9 (p=0.03) Average duration of symptoms smear negative pulmonary TB (days) 80.4 v 100.1 (p>0.05) Average duration of symptoms non-pulmonary TB (days) 78.4 v 122.1 (p=0.03)	**Contact tracing** % associated with contacts 81.6 v 90 (p>0.05) Mean number of contacts 4.57 v 4.91 (p>0.05)
Notes and other information	
Author conclusions A rapid access system of referral that incorporates a red flag coding system of potentially abnormal chest x-rays is effective	**Limitation identified by review team** The present article is an abstract and thus provides limited detail on the intervention implemented and population

in identifying a significant proportion of pulmonary TB cases and reducing the time to assessment and treatment of smear positive pulmonary TB. **Author limitations** NR **Evidence gaps and/or recommendations for future research and policy** NR. **Source of funding** NR	demographics.

UK Rural (1 study)

Abubakar 2006

Authors: Abubakar, I., Chalkley, D., McEvoy, M et al.
Year: 2006
Citation: Evaluating compliance with national guidelines for the clinical, laboratory and public health management of tuberculosis in a low-prevalence English district. Public health. 120:155-60
Location:
Aim of study: 1) to review the clinical management of TB; 2) to determine if all cases of TB in a local hospital were reported to the 'proper officer'; 3) to ascertain the extent of follow-up of identified contacts
Study design: Audit
Quality score: Not available from CA checklist used
External validity score: Not available from CA checklist used

Population and setting

Source population
TB cases in rural England district
(East and North Hertfordshire)

Eligible population
Any patients with confirmed TB in the targeted area

Confirmed TB case defined as either culture-confirmed TB or based on clinician's judgement, clinical and/or radiological signs and/or symptoms compatible with TB diagnosis and on whom clinician decided to treat with full course of anti-TB treatment

Selected population
Eligible patients who attended between 1 April 2002 and 30 November 2003

Excluded population
NR

Population characteristics
46.9% Female; Median age: 48.5 years; 40.6% Caucasian; 37.5% Indian Subcontinent; 47% (15/32) non-UK-born; 62% pulmonary TB; 45.5% HIV positive (of 11 tested)

Setting
District general hospital

Location
UK - rural

Methods of allocation to intervention/control

Method of allocation
NA

Method to minimise confounding
NA

Recruitment strategy
Search of all statutory notifications of cases to the proper officer, district enhanced surveillance database, pathology database, local microbiology laboratory data, hospital administration records, paper records held by TB nurse and the pharmacy database.

Sample sizes:
Total sample N**=** 32
Intervention N= NA
Comparator N= NA

Baseline comparisons
NA

Power of study
NR

Intervention
Audit (2002/2003) of standards for clinical and public health management using national guidelines on management of TB (British Thoracic Society and Interdepartmental Working Group on Tuberculosis)
Standards on:
--public health (including notification and follow-up of close contacts)
management of patients by an 'appropriate clinician'
-facilities and support
-case management
-measures to reduce transmission
Comparator
NA

Outcomes and methods of analysis

Outcomes
Contact tracing. Compliance with published guidance in relation clinical management , including care plans, management by appropriate clinician.

Methods of analysis
Percentages and summary measures, Fisher's exact test, *t*-test

Follow up period NA	
Service delivery results	
Results **TB cases reported to 'proper officer'**: 81.2% (26/32) cases reported to 'proper officer' 90.6% were on TB treatment 2 not on treatment at time of audit due to adverse reactions – subsequently resumed therapy. **Follow-up of contacts:** 82% had 2-24 contacts (2 cases had wider contacts) 73.4% (91/124) contacts seen by specialist nurse 2 patients refused to give contact names 54.9% contacts had BCG scar/history 7 needed treatment 3 had abnormal chest x-ray **Clinical management of contacts:** 83% (24/29) reported no difficulties complying with treatment Compliance rates did not significantly vary by age, ethnicity, gender or place of birth. 12 days (SD 13) average referral time to respiratory physician (11/32 had a recorded referral time) 12.9 h (SD 46.6h) average time from requesting the chest x-ray results to reaching the managing clinician 19% patients were not notified (2 were 'out-of-district') All TB/HIV co-infected notified to proper officer (GUM clinics not aware of 1 patient) 18 admitted to hospital: 55% had risk assessment prior to admission; 61% (11/18) care plan in case notes	**Other results** 'Several cases' were encountered where the national recommendation of minimum 1 nurse for every 50 notifications per year did not provide enough resources 21 had sputum smear test for AFB – 48% positive (average 9.3 days, SD 23.5 days to obtain result) 52% (13/22 tested) had culture + disease 2 drug-resistant TB **Attrition details** During audit process: 7 died (1 unrelated to TB) Missing data (32.3%) for outcome of care.
Notes and other information	
Author conclusions The findings of this audit were used to improve the process of hospital infection control and links between microbiologists, clinicians and public health doctors in the management of tuberculosis. A small number of patients are still not notified. Ensuring TB specialist nurse early in course of illness improves initiation of prompt contact tracing. Guidelines definitions of casual and close contacts are not clear enough in practice, which can lead to difficulties in contact tracing. Anxiety among clinical and non-clinical staff in low-prevalence areas is not recognised enough and this can complicate the management of contacts. **Author limitations** Small sample size limits generalisability **Evidence gaps and/or recommendations for future research and policy** Recommend the routine monitoring of national standards within the hospital. Availability of rapid diagnostic tests would improve care by limiting delayed diagnosis. **Source of funding** NR	**Limitation identified by review team** Retrospective data collection for 28% (9/32) of patients.

UK Prison (1 study)

Ahmed 2007

Authors: Ahmed, S., Newton, A., & Allison, T.
Year: 2007
Citation: Tuberculosis in a Yorkshire Prison: Case Report. Eurosurveillance. 12:7-9
Location: Yorkshire, UK
Aim of study: To conduct and report on the contact tracing of a TB case in a Yorkshire prison
Study design: Cross sectional
Quality score: Not addressed by CA checklist
External validity score: Not addressed by CA checklist

Population and setting

Source population Contacts of an index TB case **Eligible population** Contacts to the index TB case **Selected population** All family and hospital contacts. For contacts in prison screening started for a restricted number of contacts and extended further if there was evidence of active transmission of disease. **Excluded population** For prison contacts: those who spent less than 30 cumulative hours with the case	**Population characteristics** Index TB case:28 year old male prisoner of Pakistani origin with a diagnosis of pulmonary TB **Setting** Yorkshire prison **Location** Yorkshire, UK

Methods of allocation to intervention/control

Method of allocation Allocated to groups via method of identification for screening – i.e. how they came into contact with the index case **Method to minimise confounding** NA **Recruitment strategy** NA **Sample sizes:** **Total sample** N**=** 1 prisoner **Baseline comparisons** NR **Power of study** NR	**Intervention** Contact tracing in a prison using stone in pond method. **Comparator** NA

Outcomes and methods of analysis

Outcomes Contact tracing. For prison contacts, screening started for a restricted number of contacts and extended further if there was evidence of active transmission of disease. **Follow up period** NR	**Methods of analysis** Frequencies

Service delivery results

Contact tracing of prisoners **Contacts selected using cumulative 30 hours cut-off point = 34/600 prisoners** Prisoners from training course contacts = 19 Close friend contact = 1 Prison officer contacts = 12 Teacher contacts = 2	**Contact tracing of family** Family contacts were managed by relevant CCDCs; 3 contacts were screened no cases were found. **Contact tracing of hospital contacts** 16 contacts were screened at the A&E department were the prisoner spent 13 hours. No cases were detected. **Attrition details**

Number of people quantiferon positive = 3/34 Prisoners from training course contacts = 1/19 Close friend contact = 1/1 Prison officer contacts = 1/2 Teacher contacts = 0/2 **Number of people with abnormal chest x-ray = 1/34** Close friend contact = 0/1 **Number of people receiving therapy = 3/34** Prisoners from training course contacts = 1/19 given 2 months prophylaxis Close friend contact = 1/1 given 6 months therapy Prison officer contacts =1/2 given 3 months prophylaxis	Courses contacts: 1 refused 4 prisoners released prior to screening (2 did not attend screening, 2 unknown attender/non-attender) Teacher contacts: 1 declined Heaf test but completed blood test and chest x-ray
Notes and other information	
Author conclusions The agreed upon selection criteria, screening tools and effective integrated community and hospital TB service resulted in the successful management of the incident. Challenges of dealing with TB in prisons include: • Movement of prisoners from one prison to another • Prisoner behaviour (e.g. tampering with tests) • Concerns/attitudes of prison staff • Relatively low prevalence leading to diagnostic delay Although guidelines are available for the management of TB in the community (for example, BTS and NICE guidelines) these may not be entirely suitable in a specialist setting and additional pragmatic measures may be necessary. **Author limitations** NR **Evidence gaps and/or recommendations for future research and policy** It would be helpful if prison regulations allowed for restriction on movement of prisoners during investigation of a case or outbreak of a communicable disease. Development of mechanism to improve medical follow-up of released prisoners would be valuable. Need to raise awareness of TB among prisoners, prison officers and health care workers working in prisons. **Source of funding** NR	**Limitation identified by review team** No data analysis, only frequencies reported

New York City (5 studies)

Anger 2007

Authors: Anger HA, Proops D, Harris TG, et al.
Year: 2012
Citation: Active case finding and prevention of tuberculosis among a cohort of contacts exposed to infectious tuberculosis cases in New York City. CID, 2012, 54:1287-95.
Location: New York City, USA.
Aim of study: To assess the impact of contact investigation as an active case-finding modality and an opportunity for TB prevention.
Study design: Retrospective cohort study.
Quality score: +
External validity score: +

Population and setting

Source population
Contacts of people with TB in NYC between 1997 and 2003.

Eligible population
Contacts of people with TB in NYC who had a known date of birth, were living in NYC, did not have an index case with MDR-TB, and did not have an index case aged 5 years old or less.

Selected population
Contacts of people with TB in NYC who could be evaluated.

Excluded population
People died during contact investigation, relocated during contact investigation, treated for active TB within 1 year prior to diagnosis of index case.

Population characteristics (contacts without prevalent TB)
Index TB case: 56% aged 18-44; 19% HIV co-infected; 24% unknown HIV status; 59% male.
Contact of TB case: 46% aged 18-44; 1% HIV co-infected; 88% unknown HIV status; 49% male.

Setting
Community

Location
Urban – NYC

Methods of allocation to intervention/control

Method of allocation
NA

Method to minimise confounding
NR

Recruitment strategy
NA

Sample sizes:
Total sample N=36,606 contacts (of 5731 cases)
Intervention N=30,561 contacts (of 5,182 cases)
Comparator N=NA

Baseline comparisons
NA

Power of study
NR

Intervention
NYC TB service, with a focus on contact investigation.

Comparator
NA

Outcomes and methods of analysis

Outcomes
Proportion of contacts screened, LTBI diagnosis, chemoprophylaxis initiation, treatment completion.

Follow up period
Contacts were retrospectively followed up for 4 years after exposure.

Methods of analysis
Poisson regression, clustered cox proportional hazards regression, absolute risk reduction with 95% confidence intervals, and multivariate analysis.

Service delivery results

Contact tracing outcomes
89% of contacts were eligible for TST testing (27,363/30,561)
27.1% were TST-positive (8,270)
48% were TST-negative (14,654)

Development of active TB
46/6001 contacts developed active TB during the 4 year follow up
22 of the cases had initiated chemoprophylaxis

7.2% were not tested (2,199) 7.3% were window-negative TST (2,240) 1% active TB (378) **Treatment completion** 47.9% completed LTBI treatment (3,642) 29.2% did not complete LTBI treatment (2,219) 21% did not start LTBI treatment (1,596) 1.8% stopped LTBI treatment due to adverse events (140)	24 had not initiated treatment The absolute risk reduction afforded by chemoprophylaxis was 1.1% (95% CI 0.6% to 1.9%). Number needed to treat to prevent 1 TB case was 88 contacts (95% CI 53 to 164) within 4 years of exposure. **Attrition details** NA
Notes and other information	
Author conclusions Contact investigation facilitates active case finding and TB prevention, even with suboptimal chemoprophylaxis completion rates. **Author limitations** Due to the fact the study used data collected for routine purposes many contacts had missing data, including details on HIV status. The study was also unable to account for incident TB among contacts who moved outside of NYC. **Evidence gaps and/or recommendations for future research or policy** The effectiveness of contact investigation would likely be improved if chemoprophylaxis uptake and completion rates were increased through the use of shorter but equally effective chemoprophylaxis regimens. **Source of funding** NYC Department of Health and Mental Hygiene, Bureau of TB control.	**Limitation identified by review team** Due to the nature of the study there is the potential for a high degree of confounding. This was not controlled for or discussed.

Munsniff 2006a

Authors: Munsiff, S. S., Ahuja, S. D., King, L. et al.
Year: 2006
Citation: Ensuring accountability: the contribution of the cohort review method to tuberculosis control in New York City. International Journal of Tuberculosis Lung Disease 2006, 10:10
Location: New York City
Aim of study: To describe the methodology to implement cohort review in a large urban TB control program and make suggestions on how to initiate it in a variety of settings.
Study design: retrospective cohort study
Quality score: +
External validity score: +

Population and setting

Source population
TB cases (as defined by CDC) in NYC reviewed by the Bureau of Tuberculosis Control (BTBC) at cohort review meetings.

Eligible population
All TB cases reviewed by the NYC BTBC cohort review meetings in 2004.

Selected population
All new and retreatment TB cases presented during the 16 cohort review meetings in 2004.

Excluded population
NA

Population characteristics (2004 sample)
57.1% sputum culture-positive *M. tuberculosis*; 64.7% positive sputum AFB smear results; 17.8% had *M. tuberculosis* isolated by culture from another respiratory specimen;16.3% HIV-infected.

Setting
Community

Location
Urban – New York City

Methods of allocation to intervention/control

Method of allocation
NA

Method to minimise confounding
NA

Recruitment strategy
NA

Sample sizes:
Total sample N**=** number of cases registered from 1989-2004 presented on graph and unable to extract figures.
Intervention N=1039 (TB cases in 2004)
Comparator N=1433 (TB cases in 1999)

Baseline comparisons
NA

Power of study
NA

Intervention
The NYC BTBC cohort review process* in 2004. This included a review of epidemiology, individual patient history and treatment, and assessment against national targets. As each case is presented cases are documented. Meetings are quarterly and results are sent to managers.
*(BTBC developed the cohort review process in 1993)

Comparator
"outcome indicators of [cohort review of]1999 TB cases were also reviewed as an arbitrary (5 years back) point of comparison."

Outcomes and methods of analysis

Outcomes
Contact tracing.
'Treatment completion' = cases who completed treatment within 365 days of treatment initiation.

'Likely to complete' cases = not completed treatment at the time of cohort, but, barring any unforeseen complications, are likely to complete treatment within 365 days of treatment initiation.

'Cohort failures' = did not complete treatment within 365 days due to treatment problems or poor adherence.

Issues identified during cohort review meetings:

Methods of analysis
NR

Data issues(incorrect, unclear or unknown patient information); treatment issues(follow-up of drug regimen, clinical diagnosis, clinical procedures); case management issues (execution of standard procedures with TB cases); education and training issues (outreach to the community, private providers and/or Bureau of TB Control staff);contact investigation issues (e.g. not identified or delayed or not done);epidemiology issues (cases requiring expanded contact investigations and high-risk cases e.g. health care workers or cases living in congregate settings). **Follow up period** Each case followed by cohort review meetings until discharge from TB care	
Service delivery results	
Results **International indicators:** Treatment success: 2004(n=996): 80.6% v; 1999(n=1406) : 82.8% **National indicators for all new and retreatment cases:** ≥90% of newly diagnosed patients who began treatment completed treatment within 365 days, (excluding cases with isolates resistant to RMP, and cases who died): 2004: 86.5% v 1999: 85.7%; ≥90% of cases appropriate for contact investigation will have contacts identified: 2004: 95.3% v 1999: 90.5%; **NYC indicators for all new and retreatment cases:** ≥50% of cases presented in cohort complete treatment at the time of cohort(excluding cases with isolates resistant to RMP, and cases who died): 2004: 49.7% v 1999: 69.2%; ≥70% of patients eligible for DOT and have been on DOT 2004: 72.2% (median of 6 months of DOT at time of cohort review) v: 1999: 66.1%; **Contact tracing** 2004: of 718 eligible cases, 5933 contacts identified 1999: of 1020 eligible cases, 5105 contacts identified Mean contact index: 2004: 8.3 v 1999:5.0 Of evaluated, previous TB cases: 2004: 0.8% v1999: 2.0% Of the patients who were tested: with TB: 2004: 1.0% v 1999:1.8% with LTBI: 2004: 27.2% v 1999: 31.7% started on LTBI treatment: 2004: 90.5% v 1999: 88.2% completed or were still on LTBI treatment at time of cohort: 2004: 82.9% v 1999:72.8% **Outcomes of 2004 NYC TB cases**: Treatment initiated for 98.4% By the cohort review (approx. 5-8 months after initial TB diagnosis): 45.3% completed treatment; 37.1% 'likely to complete'; 7.0% died prior to treatment completion; 3.7% 'cohort failures'; 3.2% defaulted; 2.1% transferred outside NYC. Outcome indictors improved from 1999 to 2004: Patient deaths: -2.4% Contacts identified: +4.8%	**Other results** NYC TB cases decreased by 72.7% from 1992 – 2004 Treatment success rates: increased by 26.7% between 1992 (62.8%) and 2004 (85.6%) Treatment completion(met national objective of completing treatment within 365 days): 1992: 39.7% to 2004: 85.6% (p<0.001). Tracking of issues raised during 2004 cohort review: 596 issues identified in 2004 among 424 patients Data issues: 55.0% Treatment issues: 13.8% Case management issues: 12.4% Contact investigation issues: 10.6% Epidemiology issues: 5.5% Education and training issues: 2.7% 76.5% of issues identified addressed within 30 days of cohort review meeting; 85.2% issues resolved by subsequent review. **Attrition details** 2.1% transferred outside NYC

Patients on DOT: +6.1%	
Notes and other information	
Author conclusions Cohort review process is the BTBC's most important method of programme evaluation. A systematic review of every TB case improved the quality of patient information, enhanced patient treatment and ensured accountability at all levels of the TB control program. Cohort review was considered an important method of programme evaluation for tracking national objectives and quantifying how TB control in NYC has improved and key to improving patient outcomes. The principles of the NYC cohort review process can be applied to areas of high and low TB incidence. **Author limitations** Although there was improved patient care, limitations of the cohort review process was that they are time- and labour-intensive and are undertaken 5-8 months after treatment initiated, therefore some aspects of care cannot be assessed and it may be too late to intervene. **Evidence gaps and/or recommendations for future research and policy** The general principles of cohort review can be applied to a broad range of public health issues, any programme that monitors and evaluates outcomes of patients or that requires intensive case management using a team of staff can use this method. **Source of funding** NR	**Limitation identified by review team** This is specific to the NYC TB system: case management system, coordination of the BTBC and funding.

Munsniff 2006b

Authors: Munsiff, S. S., Ahuja, S. D., Li, J. et al.
Year: 2006
Citation: Public-private collaboration for multidrug-resistant tuberculosis control in New York city. Int. J. Tuberc. Lung Dis. 10:6
Location: New York City
Aim of study: To evaluate treatment outcomes of primary multi drug-resistant tuberculosis (MDR-TB) patients treated by multiple providers.
Study design: Retrospective cohort study
Quality score: +
External validity score: +

Population and setting

Source population
People with MDR-TB in New York City

Diagnosis date of MDR-TB was defined as the collection date of the first specimen from which an MDR *M. tuberculosis* strain was isolated.

Eligible population
All MDR-TB cases in NYC from 1 January 1992 - 31 December 1997.

Selected population
Patients with *Mycobacterium tuberculosis* isolates resistant to at least isoniazid and rifampin, and who had ≤30 days of anti-tuberculosis treatment prior to the collection of the first MDR-TB specimen

Excluded population
Non-drug resistant TB
MDR-TB cases with >30 days treatment prior to collection of the initial MDR-TB specimen

Population characteristics (whole cohort)
Pulmonary (only) TB: 67% ; Combined pulmonary & extrapulmonary TB: 21%; Extrapulmonary (only) TB: 12%; median age: 39 years s range 4-90); Male: 68%; US-born: 81%; HIV-infected: 60%; died prior to treatment completion: 57%; positive culture within 30 days of death: 51%

There was no difference in relation to race/ethnicity, homelessness, borough of residence, respiratory smear status (for pulmonary patients) over the study period**.**

Setting
Urban TB control programme where enhanced MDR-TB management plan coordinates with multiple providers.

Location
Urban - NYC

Methods of allocation to intervention/control

Method of allocation
NA

Method to minimise confounding
NA

Recruitment strategy
All MDR-TB patients from the NYC BTBC TB Registry during the study time period

Sample sizes:
Total sample N**=** 856
Intervention N= 553 (1993-1997 service; n=46 in 1997 service)
Comparator N= 303 (1992 service)

Baseline comparisons
NA

Power of study
NR

Intervention
Service in1997:
From 1993 onwards a central MDR-TB Surveillance Coordinator oversaw regional MDR-TB coordinators assigned to each of the 5 NYC boroughs.
Regional MDR-TB staff coordinated flow of information to all concerned parties, including BTBC staff and the medical provider. MDT-TB case management was in addition to standard case management practices in place

Comparator
Service in 1992: no specific MDR-TB unit or centralised MDR-TB surveillance coordinator.
Direct observation of treatment was the 'standard of care' but voluntary in most cases.

Outcomes and methods of analysis

Outcomes
Treatment completion defined as at least 18 months of MDR-TB treatment with at least 12 months of treatment following the last negative culture

Treatment failure defined as positive culture ≥5 months after

Methods of analysis
X^2 test, linear regression, Cox proportional hazards model

starting MDR-TB treatment, regardless disease site Death before treatment completion. Relapse defined as positive culture occurring after treatment completion **Follow up period** Until transferred out of NYC, were lost to follow-up prior to treatment completion, death, date of relapse or until 31 January 2001. Follow-up after treatment completion was passive.	
Service delivery results	
Results **Treatment completion** Whole cohort = 27% Rates improved significantly over study period: 43.5% in 1997 vs 11.6% in 1992 (p<0.001) Of patients given MDR-TB treatment (n=610): Treatment completion: 37.2% (227/610) By HIV status (n=856): HIV-infected = 17% (87/512) Non-HIV-infected = 59.3% (105/177) HIV unknown = 21% (35/167) Factors associated with treatment completion stratified by HIV status showed that patients with HIV-infection were more likely to complete if diagnosed later in study period or had cavity chest radiograph. **Death prior to treatment completion** Whole cohort = 57.2% (490/856) The proportion of patients who died prior to treatment completion: 39.1%(18/46) in 1997 vs 69.0% (209/303) in 1992 (p<0.001) Patients given MDR-TB treatment (n=610) = 44.4% (271/610) Patients who received treatment but not MDR-TB treatment (175/856) = 92% (70.9% HIV-infected) Patients who received no treatment (71/856) = 90.1% **Treatment failure** HIV-infected = 17.4% (89/512) Non-HIV-infected = 17.5% (31/177) HIV unknown = 5.4% (9/167) **Relapse** Of patients who completed treatment (227/610) = 3.5% relapsed (8/227) Overall rate = 1.01 per 100 person-years of follow-up Rate for HIV-infected = 2.06 per 100 person-years of follow-up Rate for non-HIV-infected = 0.52 per 100 person-years of follow-up Rate for HIV status unknown patients = 0.61 per 100 person-years of follow-up (*p*= 0.049).	**Attrition details** 16.0% (137/856) transferred out, refused treatment or were lost to follow-up
Notes and other information	
Author conclusions A comprehensive MDR-TB control programme improved the outcomes of both HIV-infected and non-infected individuals. Relapse was infrequent among patients who completed the recommended regimens. However, many patients still died before or despite receiving	**Limitation identified by review team** May not generalise outside of NYC as substantial funding and infrastructure in place to combat MDR-TB in NYC

MDR-TB treatment and a significant proportion were lost to follow-up. The long duration of MDR-TB therapy can lead to greater risk of non-adherence to treatment. **Author limitations** The authors noted that reasons for changes in drug regimens and choice of particular drugs were not available. The authors also noted that it was not feasible to collect data on adverse events or analyse outcomes based on specific drug regimen because of the complex individualised regimens/frequent changes due to intolerance. They also did not have data on some clinical aspects that would have allowed correlation of outcomes with severity of HIV infection or measure the impact of highly active antiretroviral therapy on the survival of HIV-infected patients from 1997 onwards. **Evidence gaps and/or recommendations for future research and policy** Use of evolving technology to obtain more rapid DST results could significantly improve treatment outcomes. **Source of funding** Supported by NYC Department of Health, BTBC programme funds.	

Pursnami 2014

Authors: Pursnani, S., Srivastava, S., Ali, S., Leibert, E., & Rogers, L.
Year: 2014
Citation: Risk Factors for and Outcomes of Detention of Patients With TB in New York City. An Update: 2002-2009. Chest 2014, 145:1
Location: New York City, United States
Aim of study: To examine the characteristics and outcomes of people detained for non-adherence to TB treatment
Study design: Retrospective cohort study
Quality score: Not addressed by CA checklist
External validity score: Not addressed by CA checklist

Population and setting

Source population
Patients undergoing TB treatment in the Bellevue Hospital Chest Service, NYC

Eligible population
Patients undergoing TB treatment in the Bellevue Hospital Chest Service, NYC, between January 1st 2002 and December 31st 2009.

Selected population
Patients undergoing TB treatment in the Bellevue Hospital Chest Service, NYC, between January 1st 2002 and December 31st 2009.

Excluded population
NA

Population characteristics (Intervention v Comparator)
Mean age: 42.16 years (SD 10.19) v 43.5 (SD15.36); Male: 65% v 77%; Black: 47% v 17%; Hispanic: 32% v 26%; Asian:4% v 53%; White: 16% v 4%; Non-US born: 38% v 93%; HIV: 61% v 15%; Drug abuse: 52% v 13%; Alcohol abuse: 38% v 11%; Tobacco use: 77% v 15%; Homelessness: 42% v 7%; Incarceration: 18% v 6%; Mental illness: 25% v 9%; 1 chronic medical illness: 28% v 19%; >1 chronic medical illness: 13% v 11%; Pulmonary TB: 86% v 83%; Extrapulmonary TB: 0 v 11%; Both Pulmonary & Extrapulmonary TB: 14% v 6%; Drug resistance (any): 19% v 9%; SDR: 10% v 4%; MDR: 9% v 4%; Sputum smear positive: 23%v 17%; sputum culture positive: 46% v 44%

Setting
Hospital

Location
Bellevue Hospital, New York City

Methods of allocation to intervention/control

Method of allocation
NA

Method to minimise confounding
NR

Recruitment strategy
All those detained plus a comparator sample selected by every third record selected for data abstraction.

Sample sizes:
Total sample N**=** 149
Intervention N= 79
Comparator N= 70

Baseline comparisons
NA

Power of study
NR

Intervention
Involuntary detention of patients with TB for completion of TB treatment because of non-adherence.

Comparator
Outpatient DOT TB treatment at Bellevue Hospital Chest Centre.

Outcomes and methods of analysis

Outcomes
Outcome of the detainment: Completion of treatment during hospitalisation or reduction to court-ordered out-patient DOT (CoDOT)

Risk factors for detainment

Follow up period
Duration of TB treatment

Methods of analysis
Fisher exact test, Wilcoxon-rank sum, Univariate and Multivariate logistic regression, stepwise multivariate logistic regression. X^2 test.

Service delivery results	
Treatment completion Of the patients detained: 95% (75/79) completed treatment -58%(46/79) completed in-patient detention -37%(29/79) completed treatment under outpatient court-ordered DOT Of patients undergoing DOT: 89%(62/70) completed treatment 1%(1/70) died 10% (7/70) lost to follow up	**Other results** **Multivariate analysis** Independent predictors of detention (when controlling for other variables): Presence of substance abuse: OR 9.25 (95% CI 2.81-30.39, p<0.001) Mental illness: OR 5.80 (95% CI 1.18-28.51, p=0.03) Younger age: OR 0.96 (95% CI 0.91-1.00, p=0.05) Less likely to be: Black: OR 0.15 (95% CI 0.02-1.23, p=0.077) Hispanic: OR 0.04 (95% CI 0.00-0.38, p=0.005) Asian: OR 0.01 (95% CI 0.00-0.09, p<0.001) More likely to be: Smear positive: OR 3.93 (95% CI 1.05-14.75, p=0.04) Trend toward longer duration of culture conversion in hospitalised detainees v comparators: 41.0 ± 40.0 days v 17.5 ± 17.0 days, p=0.06 **Attrition details** 10% of DOT patients lost to follow up.
Notes and other information	
Author conclusions Majority of patients undergoing court-ordered detention for TB treatment successfully completed therapy. Likelihood of detention was most strongly associated with mental illness and substance abuse. **Author limitations** Incomplete data on substance abuse in the DOT control group. Data on HIV status were missing frequently in both groups. **Evidence gaps and/or recommendations for future research and policy** There are challenges in providing medical care to vulnerable patients who may have difficulty recognising or articulating symptoms, may distrust or avoid health care system and have poor adherence to prescribed medication. There is a need for stronger coordination with mental health and substance abuse programmes to facilitate adherence to TB treatment. **Source of funding** NR	**Limitation identified by review team** Findings potentially only relevant to NYC and NYC legislative landscape.

Udeagu 2007

Authors: Udeagu C-C N, Dorsinville MS, Munsiff SS et al.
Year: 2007
Citation: Evaluation of case management in tuberculosis control: a three-year effort to improve case management practices in New York City Int J Tuberc Lung Dis 11(10):1094–1100
Location: New York City, NY, USA
Aim of study: To describe a 3-year effort to identify factors associated with lapses in case management (CM) and to improve CM practices.
Study design: Before-after (retrospective review)
Quality score: +
External validity score: +

Population and setting	
Source population TB cases in NYC **Eligible population** TB patients in clinics managed by New York City Bureau of Tuberculosis Control (BTBC). **Selected population** TB cases reported in 2002 and second quarter of 2003 **Excluded population** NA	**Population characteristics** 2002 (n=131): 68% (90) confirmed TB cases, 17% with HIV-infected 2004 (n=317): 99% (314) confirmed TB cases, with 19% HIV-infected. **Setting** Community **Location** Urban – NYC
Methods of allocation to intervention/control	
Method of allocation NA **Method to minimise confounding** NR **Recruitment strategy** NA **Sample sizes:** **Total sample** N**=** 445 **Intervention** (post) N=314 **Comparator (pre)** N=131 **Baseline comparisons** NA **Power of study** NR	**Intervention (Post)** CDC Framework for programme evaluation of CM strategies in 2003-2005. Improvement strategies implemented including CM and related protocols were revised, training, appointment of a DOT working group to improve strategies for offering DOT and enrolling patients **Comparator (Pre)** Evaluation of CM practices in 2002 using a standard tool.
Outcomes and methods of analysis	
Outcomes Patient education, patients offered DOT. **Follow up period** 2003-2005 for intervention 2000-2002 for comparator	**Methods of analysis** X^2 or Fisher's exact test. Non parametric analysis to compare means among groups.
Service delivery results	
Evaluation of CM activity (post vs pre) **Patient education %**	**Other results** **Additional outcomes in 2004 review:** Timeliness of interview of sputum AFB-smear positive

Knowledge of diagnosis: 36 vs 35; p=0.84 Offered DOT: 74 vs 32; p<0.001 Importance of monthly follow-up: 51 vs 24; p=0.001 Informing patients about availability of NY TB (BTBC) services: 61 vs 36; p<0.001 Knowledge of development of resistance: 61 vs 36 p<0.001 **Supervision %** Patient records with no supervisor's notes :31 vs 50; p<0.0001 Addressed completeness of forms: 14 vs 15 ; p=0.73 Address inaccuracy of information: 11 vs 8 ; p=0.28	patients vs other cases: 68% vs 64%; Conduct interviews within 3 days: for all patients : (74% BTBC clinic case managers vs. 56%, non-BTBC patient case managers p= 0.001) for AFB-positive smear patients: (87% BTBC clinic case managers vs. 69%, non-BTBC patient case managers p= 0.02). Patients managed at BTBC clinics compared to non-BTBC were more likely to receive education on : benefits of DOT (90% vs. 75%, p= 0.001) and to enrol in a DOT program (96% vs. 76%,p=0.0001). 57%(17/314) were non-adherent to treatment at any time during the course of their treatment and 23%(13) had more than one episode of non-adherence. **Attrition details** NR
Notes and other information	
Author conclusions The case management evaluation identified lapses in CM practices and program supervision, which were used to adjust protocols, target interventions, and focus education and training to improve the service. The lapses were not obvious from routine observations. **Author limitations** Varied methodologies were used to for the evaluations and varied interventions were designed to target issues found; and the absence of a systematic evaluation of CM practices prior to 2002 **Evidence gaps and/or recommendations for future research and policy** The authors suggested that the CDC framework could serve as a useful methodology for a TB control programme. **Source of funding** Funding for 2004 study provided by CDC.	**Limitation identified by review team** The cost-effectiveness of case management was not studied.

Netherlands (2 studies)

De Vries 2007

Authors: de Vries, G., van Hest, R.A., & Richardus, J.H.
Year: 2007
Citation: Impact of Mobile Radiographic Screening on Tuberculosis among Drug Users and Homeless Persons. Am J Respir Crit Care Med. 176:201-207
Location: Rotterdam, Netherlands
Aim of study: Describe trends and characteristics of TB among illicit drugs users and homeless persons with TB, evaluate four years of systematic screening, and determine effect of radiographic screening on transmission.
Study design: Retrospective quantitative before and after study
Quality score: +
External validity score: +

Population and setting

Source population
Persons with active TB in Rotterdam, Netherlands

Eligible population
Persons in Rotterdam with a notified TB case diagnosed during 1 January, 1993 – 31 December, 2005.

Selected population
Illicit drugs users with a registered address and homeless persons living in Rotterdam with notified TB cases.

Excluded population
NR

Population characteristics
Illicit drug users and homeless persons v other TB cases without this risk profile:

Male: 73.8% v 59.7%; 0-19 yrs: 0.5% v 13.6%; 20-39 yrs: 56.3% v 48.4%; 40-59 yrs: 41.7% v 24.2%; 60+ yrs: 1.5% v 13.8%; born in Netherlands: 37.9% v 25.7%; previous TB history: 6.3% v 6.4%; HIV co-infection: 14.6% v 4.0%; pulmonary TB: 90.3% v 59.8%; positive sputum/bronchoalveolar lavage fluid smears: 59.7% v 48.4%; culture positive: 91.7% v 77.5%; drug resistant: 3.2% v 5.5%.

Population characteristics significantly different between groups for all characteristics except previous TB history and drug resistance (unadjusted p value).

Setting
Mobile TB screening in Rotterdam

Location
Urban – Rotterdam, Netherlands

Methods of allocation to intervention/control

Method of allocation
NA

Method to minimise confounding
NA

Recruitment strategy
NA

Sample sizes:
Total sample N**=** 1,811
Intervention N= 206 (homeless and drug users with TB)
Comparator N= not reported

Baseline comparisons
NA

Power of study
NR

Intervention
A comprehensive, targeted TB screening program with mobile digital X-ray unit (MDXU) was used to systematically screen illicit drug users and homeless persons for TB in Rotterdam. MDXU screening began in 2002.

Comparator
Before the mobile screening was introduced.

Outcomes and methods of analysis

Outcomes
TB cases found through active screening (contact investigation and screening) found during MDXU. Also reported treatment completion.

Methods of analysis
Demographics, including proportions. X^2 tests. Odds ratios. Multivariate logistic regression.

Follow up period NA	
Service delivery results	
Results During 3 years and 8 months of screening programme the TB prevalence rate was 327 cases per 100,000 radiographs (28 TB cases out of 8559 chest X-rays taken in 3248 people). Proportion cases found through active screening (contact investigations and screening) during MDXU screening v prior to program: 59.2% (42/71) v 29.5% (26/88) (p < 0.001) Annual notification rate among illicit drug users/homeless persons: 2005 (after screening): 244 per 100,000 2002 (before screening):533 per 100,000 Proportion smear positive cases among illicit drug users/homeless persons: 2002 – 2005 (after screening): 47.9% (34/71) 1997 – 2001: 58.0% (51/88) 1993 – 1996: 55.3% (26/47) Decrease after screening not statistically significant (*p*=.11)	**Other results** Treatment completed during study period (1993-2005) Proportion (illicit drug users/homeless persons v TB cases in Rotterdam without risk profile): 79.1% v 86.8% (p< 0.05) Unadjusted OR (95% CI): 0.6 (0.4 – 0.8) ****** 25/28 (89.2%) cases identified through MDXU completed treatment. Contact investigations (active case findings): Proportion illicit drug users/homeless v TB cases without risk profile: 40.3% v 16.4% Adjusted OR (95% CI): 3.6 (2.4 – 5.2) Proportion TB cases among illicit drug users/homeless persons: 1993 - 1996: *p* = 0.58 1997 - 2001: *p* = 0.11 2002 (MDXU began) - 2005: *p* = 0.03 **Attrition details** NA
Notes and other information	
Author conclusions TB screening among illicit drug users and homeless persons with mobile digital X-ray units reduced the number of notified TB cases among these groups and transmission decreased. DNA fingerprinting is useful for evaluating the impact of screening programmes. **Author limitations** NR **Evidence gaps and/or recommendations for future research and policy** The authors recommended that TB screening should be continued to prevent a resurgence of TB. **Source of funding** NR	**Limitation identified by review team** This study is likely only generalizable to illicit drug users and homeless persons.

Lamberts-van Weezenbeek 2003

Authors: Lambregts-van Weezenbeek, C.S.B., Sebek, M.M.G.G., van Gerven, P.J.H.J., de Vries, G., Verver, S., Kalisvaart, N.A., & van Soolingen, D.
Year: 2003
Citation: Tuberculosis contact investigation and DNA fingerprint surveillance in The Netherlands: 6 years' experience with nation-wide cluster feedback and cluster monitoring. Int J Tuberc Lung Dis, 7(12):S463-S470.
Location: The Netherlands
Aim of study: The aim of the study was to assess whether DNA fingerprint surveillance could enhance contact investigations.
Study design: Cohort
Quality score: +
External validity score: +

Population and setting

Source population People with TB in The Netherlands. **Eligible population** From 1995-2000, TB cultures were standardised by restriction fragment length polymorphism (RFLP) typing. Those that clustered were reported to regional TB nurses, who complete questionnaires on contact investigations and epidemiological links. **Selected population** Questionnaires from 1995-2000 which clustered were revised. Questionnaires were completed for 91% of eligible cases. **Excluded population** NA	**Population characteristics (Intervention v Comparator)** NA **Setting** Netherlands TB service **Location** The Netherlands

Methods of allocation to intervention/control

Method of allocation NA **Method to minimise confounding** NR **Recruitment strategy** NA **Sample sizes:** **Total sample** N**=** 3,954 (reported to regional nurses) **Intervention** N= 3,602 (had completed questionnaires); N=2206 (after cluster feedback) **Comparator** N= 2206 **Baseline comparisons** NA **Power of study** NR	**Intervention** A national program involving voluntary collaboration between regional TB services standardised documentation of restriction fragment length polymorphism (RFLP) typing for all TB isolates. The epidemiological link was confirmed using RFLP patterns and clusters. **Comparator** The epidemiological link before the RFLP result.

Outcomes and methods of analysis

Outcomes Proportion of contact investigations that were re-opened or extended due to epidemiological linking of RFLP clusters. **Follow up period** NA	**Methods of analysis** Descriptive statistics, including proportions.

Service delivery results

Proportion contact investigations re-opened or extended: 34/3602 (0.9%) This resulted in detection of 71 contacts with LTBI and 12 cases of smear-negative TB.	**Other results** Reasons for limited impact of RFLP result on contact tracing:

Epi links established among clustered cases: After RFLP result: 24% (540/2206) Before RFLP result: 21% (462/2206) Epi links based on documented exposure: After RFLP result: 550 epi links Before RFLP result: 357 epi links This was an increase of 35% (*P* <.001)	Contact took place 1-7 years previously: 51% Documented contact involved in subsequent case in cluster: 21% Casual contact: 15.5% Contact took place in different region: 9% Patient developed TB after passing contact investigation exam: 2% Proportion epi links established via contact investigation but contradicted by RFLP result: 5% **Attrition details** NA
Notes and other information	
Author conclusions DNA fingerprinting should be considered a complementary strategy which begins when conventional contract tracing ends. DNA fingerprinting has detected institutional deficiencies and provided a justification to address these problems. As such, the authors deemed that the €200,000 used to conduct DNA fingerprinting is money well spent. **Author limitations** NR **Evidence gaps and/or recommendations for future research and policy** NR **Source of funding** Netherlands Ministry of Health	**Limitation identified by review team** There was no attempt to formally assess the cost-impact or cost-effectiveness of the programme; thus the claim of 'money well spent' must be viewed with caution.

Canada (2 studies)

Richards 2005

Authors: Richards, B., Kozak, R., Brassard, P., Menzies, D., & Schwartzman, K.
Year: 2005
Citation: Tuberculosis surveillance among new immigrants in Montreal. Int J Tuberc Lung Dis 9(8):858-864
Location: Montreal, Canada
Aim of study: Overall aim of study which is out of scope of review – measure performance of LBTI surveillance program among immigrants; Secondary aim which is within scope of review – physician adherence to LTBI management guidelines from Canadian Tuberculosis Standards#
Study design: Audit
Quality score: CA scores not available
External validity score: CA scores not available

Population and setting

Source population
Immigrants in Montreal, Canada.

Eligible population
Newly arrived adult Canadian permanent residents who were referred for surveillance of inactive TB between1999 and 2000.

Selected population
Immigrant without active TB or without previous adequate treatment for TB.

Excluded population
Insufficient data to compare physician decisions with Canadian guidelines.

Population characteristics (Intervention v Comparator) –> (Patients referred versus not referred: mean ± SD)
NR

Setting
Regionally centralised TB program in Montreal, Canada, based at a TB referral centre.

Location
Urban - Montreal

Methods of allocation to intervention/control

Method of allocation
NA

Method to minimise confounding
NR

Recruitment strategy
NA

Sample sizes:
Total sample N=493
Intervention N=379
Comparator N=NA

Baseline comparisons
NA

Power of study
NR

Intervention
Physicians' treatment decisions for patients with LTBI

Comparator
Canadian Tuberculosis Standards.

Outcomes and methods of analysis

Outcomes
Adherence to Canadian Tuberculosis Standards' recommendations for LTBI treatment.

Follow up period
NA

Methods of analysis
Descriptive, including proportions. Odds ratios. *t*-tests. X^2 test. Multivariate logistic regression.

Service delivery results

Results
Overall physician adherence to Canadian TB standards
Physician treatment decisions adhered to guidelines in 331/379 (87%) patients.

When standards recommended treatment: 193/203 (84%)

Other results
Multivariate logistic regression indicated patient age and clinician volume only significant predictors of TST and treatment referrals; see adjusted odds ratios below OR (95% CI)

physicians recommended treatment (correct); 10/203 (7%) did not recommend treatment (incorrect). When standards recommended NO treatment: 138/176 (93%) physicians did not recommend treatment; (correct).38/176 (16%) physicians recommended treatment (incorrect). Clinicians with high-volume of patients more likely to recommend TST and LTBI treatment than clinicians with low-volume of patients : TST: 77% vs. 46% (p<0.001) LTBI treatment: 86% vs. 71% (p = 0.03)	Age: per 10-year increase TST: 0.72 (0.62 – 0.83) LTBI treatment: 0.65 (0.51 – 0.83) High-volume clinician: TST: 3.9 (2.3 – 6.6) LBTI treatment: 2.8 (1.2 – 6.8) **Attrition details** NA
Notes and other information	
Author conclusions Overall physician adherence very good, especially as 93% patients ineligible for treatment appropriately discharged. Performance reduced by failure to refer potentially eligible patients for TST, even in experienced physicians. Decentralised programmes relying on diverse groups of community physicians more likely to perform poorly. **Author limitations** NR **Evidence gaps and/or recommendations for future research and policy** NR **Source of funding** NR	**Limitation identified by review team** Population limited to immigrants in Montreal. Physician adherence evaluated using Canadian Tuberculosis Standards. Unclear how Canadian Tuberculosis Standards compare to WHO and UK-specific guidelines. Thus, may not be generalizable to broader or international populations.

The main part of this study was on immigrant surveillance which is not within scope of this review. However, the paper did present information on physician adherence to Canadian LTBI guidelines, which is within scope. Only information pertaining to the physician adherence to Canadian LTBI guidelines is extracted here.

Tian 2013

Authors: Tian, Y., Osgood, N.D., Al-Azem, A., & Hoeppner, V.H.
Year: 2013
Citation: Evaluating the Effectiveness of Contact Tracing on Tuberculosis Outcomes in Saskatchewan Using Individual-Based Modeling. Health Education & Behavior, 40(IS), 98S-110S
Location: Saskatchewan, Canada
Aim of study: The aim was to use an agent-based (individual-based) mode of contact tracing (CT) to investigate the effects of CT scope, speed, loss to follow-up, and prioritisation on TB incidence and prevalence in Saskatchewan to improve the effectiveness of CT.
Study design: Agent-based modelling (ABM)
Quality score: not addressed by CA
External validity score: not addressed by CA

Population and setting	
Source population Aboriginal population in Saskatchewan, Canada. **Eligible population** NA **Selected population** The model population constructed was a hypothetical Aboriginal (First Nations tribes) community in Saskatchewan. **Excluded population** NA	**Population characteristics** The model population was constructed by initialising each agent (individual) with ethnic and historical attributes, a list of network contacts, and states regarding TB status, aging, and CT status. Population characteristics (ethnicity & age), birth rates, and death rates reflected Saskatchewan demographics and statistics. 90% of the population was First Nations individuals. First Nations persons and younger age groups had a higher likelihood of TB infection and progression. Data population was obtained from authors' previous research, Saskatchewan Anti-TB League reports, the Saskatchewan TB Control database and reports, vital statistics for the Saskatchewan population, and secondary literature searches. Gender and family structures not represented by model for sake of simplicity. **Setting** Hypothetical Aboriginal (First Nations tribes) community **Location** Saskatchewan, Canada
Methods of allocation to intervention/control	
Method of allocation NA **Method to minimise confounding** NA **Recruitment strategy** NA **Sample sizes:** **Total sample** N**=** 15,000 agents (individuals) **Intervention** N= NA **Comparator** N= NA **Baseline comparisons** Scenarios were compared to a baseline condition of TB in the absence of contact tracing. **Power of study** NR	**Intervention** The model produced 900 realisations across a 20-year time horizon to observe long-term outcomes of the four CT targets on cumulative TB cases. The CT parameters were drawn from estimates from Saskatchewan TB Control. CT targets: 1) scope of CT 2) speed of CT 3) degree of loss to follow-up 4) prioritisation for contacts awaiting tracing **Comparator** TB outcomes when four areas targeted compared to baseline of absence of contact tracing. The average cumulative TB incidence in the absence of CT (baseline) was 411.08 active TB cases.
Outcomes and methods of analysis	
Outcomes Effect of CT scope, speed, loss to follow-up, and prioritisation	**Methods of analysis** An aggregate model of TB dynamics for the Saskatchewan

on TB incidence and prevalence. **Follow up period** NA	population was extended to a network-based ABM with a 20 year time horizon.
Service delivery results	
Scope of CT Difference between average cumulative incidence at baseline (411.08 cases) and in all other scenarios was significant (p < 0.0001). Although CT significantly reduced average prevalence of TB in the population, diminished returns were observed as the benefits were greater for the first 45% of contacts than the second 45% contacts. **Speed of CT** Faster CT did not significantly improve prevention of active TB cases. Faster only obtained a modest reduction in prevalence of TB infection compared to normal speed. **Degree of loss to follow-up** When 90% contacts were investigated, reducing loss from historic levels of 30-40% to 10%, 15.7 TB cases on average were eliminated, which is a reduction of 5.4% (p = 0.02). This had little impact on short-term TB prevalence but had a notable impact in reducing medium- and long-term TB prevalence.	**Prioritisation for contacts awaiting tracing** Reductions seen in average cumulative incident TB cases when prioritised by… Age: (p < 0.001). Ethnicity: (p = 0.002) Age + ethnicity: (p < 0.001) These priorities also reduced TB infection prevalence, although stats not reported. Prioritising by age and ethnicity yielded an 11% reduction in mean cumulative incident cases. Prioritising CT by the number of times a contact was named during tracing resulted in adverse outcomes, with a mean increase of 26.22 incident TB cases compared to un-prioritised scenarios, or 8% (p = 0.02). **Attrition details** NA
Notes and other information	
Author conclusions Overall, CT strongly benefits TB outcomes. 1) scope of CT – secures diminishing returns as scope increases 2) speed of CT – faster CT only produced a modest reduction in TB prevalence 3) degree of loss to follow-up – can yield significant reduction in TB burden 4) prioritisation for contacts awaiting tracing – prioritising based on age and ethnicity can improve effectiveness of CT **Author limitations** The CT procedure was added to existing mechanisms drawn from a previous model, and the addition of the CT procedure may have altered the original model's dynamics. **Evidence gaps and/or recommendations for future research and policy** Future research is suggested in the areas of calibrating the model to ensure dynamics have not been altered by adding the CT procedure. In addition, further research can examine whether prioritising by the number of times an individual is named in CT increases the effectiveness of CT. **Source of funding** Saskatchewan Health Research Foundation via the Research Alliance for the Prevention of Infectious Disease Network & National Science and Engineering Research Council's Discovery Grant	**Limitation identified by review team** Several adjustments were made to the model for sake of simplicity, such as ignoring the 4.4% of contacts historically lost between the second skin test and clinical review, and not representing gender or family structures in the model. Results were reported primarily in figures, and thus limited statistics were available for extraction.

Barcelona (1 study)

Ospina 2013

Authors: Ospina JE, Orcau A, Millet J, et al.
Year: 2012
Citation: Community health workers improve contact tracing among immigrants with tuberculosis in Barcelona. BMC Public Health 2012, 12:158
Location: Barcelona, Spain
Aim of study: To determine the effectiveness of community health workers for contact tracing in a city with recent massive immigration
Study design: Quasi-experimental retrospective before and after study
Quality score: +
External validity score: +

Population and setting	
Source population People with TB in Barcelona, Spain. **Eligible population** All TB cases registered by the Barcelona TB control programme between January 1st 2000 and December 31st 2005. **Selected population** Foreign born TB cases, both pulmonary and extra-pulmonary. A case was defined as an individual who is diagnosed with TB disease and is prescribed anti-TB treatment, including those who prematurely discontinue treatment for any reason **Excluded population** NA	**Population characteristics (Intervention v Comparator)** Male: 66.8% v 68.5%; Aged over 40: 18.5% v 21.9%; India-Pakistan: 28.9% v 23.8%; North Africa: 10.8% v 16.1%; Homeless: 7.5% v 8.4%; HIV: 9.3% v 8.6%; extrapulmonary TB: 26.8% v 27.8%. The population characteristics were statistically significantly different between groups for age, ethnicity, and district of residence. **Setting** Community **Location** Urban – Barcelona
Methods of allocation to intervention/control	
Method of allocation NA **Method to minimise confounding** NR **Recruitment strategy** NA **Sample sizes:** **Total sample** N=960 **Intervention** N=388 **Comparator** N=572 **Baseline comparisons** NA **Power of study** NR	**Intervention** Contact tracing with public health nurses and five community health workers from different immigrant communities (Asia, North Africa, Sub-Saharan Africa, China, and Latin America). The community health worker was a community member of the immigrant community. The goal of the intervention was to increase contacts traced to over 70%. **Comparator** Contact tracing with public health nurse Limited detail of comparator but some mention that at this period in time the healthcare system was not set up to cope with the large amount of immigration that occurred from high TB endemic countries who did not speak Spanish
Outcomes and methods of analysis	
Outcomes Proportion of contact tracing performed. Contact tracing was defined as at least one contact traced per TB patient. **Follow up period** 2000-2002 for comparator 2003-2005 for intervention	**Methods of analysis** Descriptive, including calculating proportions. Odds ratios. X^2 test.
Service delivery results	
Contact tracing performed in all TB cases Intervention = 66.2% (257/388) Comparator = 55.4% (317/572)	**Other results** The community health workers conducted active-follow up in 194 TB cases and contact census, 264 individualised

p <0.001 **Contact tracing performed in smear positive TB cases** Intervention = 81.6% (124/152) Comparator = 65.7% (132/201) p <0.001 **Adjusted odds of *not* performing contact tracing in smear positive TB cases in the absence of community health workers** OR 2.4 (95% CI 1.3 to 4.3; p=0.005)	and 97 group educational sessions about TB, 280 home visits, 70 hospital visits and 5,935 telephone calls. **Attrition details** NR.
Notes and other information	
Author conclusions Contact tracing in areas with high immigration can be improved by community health workers who act as translators, cultural mediators and facilitators. **Author limitations** Variation in population characteristics between time periods. The cost-effectiveness of the intervention was not studied. **Evidence gaps and/or recommendations for future research and policy** The authors recommended that the community health worker should be incorporated into every TB programme with the goal of improving TB control in immigrant groups. They also suggested that this could be extended to other infectious diseases such as HIV. **Source of funding** NR	**Limitation identified by review team** Comparison in this study is public health nurse alone, and limited details were described. Whether this is a valid comparator for the UK is unclear. The comparator was also undertaken pre-2003. It was unclear if any other service delivery changes occurred during this period which could have accounted for improvements in contact tracing between the comparator and intervention period. There were, however, differences in the population characteristics between the comparator and intervention period. This study is likely to only be transferable to settings with a high proportion of immigrants from TB endemic areas who do not speak the native country language and where the proportion of contacts traced is sub-optimal with current practice.