



Public Health
England

Protecting and improving the nation's health

Reports of cases of tuberculosis to enhanced tuberculosis surveillance systems: UK, 2000 to 2016

Official Statistics



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Contents

Notes	4
Tuberculosis definition	4
Enhanced surveillance of tuberculosis	4
Data sources	5
Data type and methodology	5
Glossary	6
Table 1: Number of TB case notifications, rates and annual percentage change, UK, 2000-2016	7
Table 2: Number of TB case notifications and rates by country, UK, 2000-2016	8
Table 3: Number of TB case notifications and rates by PHE Centre, England, 2016	9
Table 4: Three-year average number of TB case notifications and rates by upper tier local authority and local authority district, England, 2014-2016	10
Table 5: Number and proportion of culture confirmed TB cases and pulmonary TB cases by country, UK, 2007-2016	20
Table 6: Number and proportion of TB cases with drug resistance by country, UK, 2000-2016	21
Table 7: TB outcome at 12 months for drug sensitive TB cases with expected treatment duration <12 months by country, UK, 2015	23
Table 8: Treatment completion at 12 months for drug sensitive TB cases with expected treatment duration <12 months by country, UK, 2006-2015	24
Table 9: Last recorded TB outcome for the entire drug sensitive TB cases by country, UK, 2015	25

Notes

Tuberculosis definition

All new tuberculosis (TB) cases (including cases diagnosed post-mortem) that meet one of the two following case definitions should be notified:

- culture confirmed case: culture confirmed disease, with speciation confirming *Mycobacterium tuberculosis* complex (*M. tuberculosis*, *M. bovis*, *M. africanum* or *M. microti*)
- clinically diagnosed case: in the absence of culture confirmation, a case that meets the following criteria:
 - a clinician's judgement that the patient's clinical and/or radiological signs and/or symptoms are compatible with active TB, *and*
 - a clinician's decision to treat the patient with a full course of anti-TB therapy for active TB

Enhanced surveillance of tuberculosis

Enhanced Tuberculosis Surveillance (ETS) was introduced in January 1999 in England and Wales and the following year in Northern Ireland. The equivalent scheme in Scotland, Enhanced Surveillance of Mycobacterial Infections (ESMI), was introduced in 2000. Data from the two systems is compiled for the purpose of UK reporting.

Clinical teams provide information on TB cases either directly through the web-based ETS system entered at the clinic, or on a case report form entered onto the system at the Health Protection Team level. Data includes notification details, demographic information, clinical and microbiological information.

Data from all TB isolates identified in UK Mycobacteria Reference Laboratories (excluding Scotland) is routinely imported into ETS and matched to case notifications using patient identifiers common to both the laboratory isolate and the case notification. In addition, external to the system, an annual probabilistic matching process based on the patient identifiers is undertaken to identify additional matches. Data for Scotland is not matched using this method.

Data sources

All TB data presented in this report for England, Wales and Northern Ireland is from ETS, other than in London where cases are notified to the London TB Register (LTBR). Data from the LTBR is routinely imported to ETS. Data for Scotland is from ESMI.

Population data used in the calculation of rates is from the Office for National Statistics (ONS), incorporating data from the National Records of Scotland and Northern Ireland Statistics and Research Agency.

Data was extracted from ETS at the beginning of April 2017 then cleaned and validated by the end of August 2017. Data for Scotland in this report may differ slightly from data presented in Scottish reports as cases that have transferred from England to Scotland were deduplicated at UK level.

PHE has produced a detailed public health report with TB data for England to the end of 2016, which is available at <https://www.gov.uk/government/collections/tuberculosis-and-other-mycobacterial-diseases-diagnosis-screening-management-and-data>.

Reports produced by the Public Health Agency Northern Ireland are available at <http://www.publichealth.hscni.net/directorate-public-health/health-protection/tuberculosis>

Reports produced by Public Health Wales are available at <http://www.wales.nhs.uk/sites3/page.cfm?orgId=457&pid=27952>

Reports produced by Health Protection Scotland are available at <http://www.hps.scot.nhs.uk/resp/resourcedetail.aspx?id=3077>

Data type and methodology

TB case notifications were reported by area of residence and by calendar year.

Overall TB rates per 100,000 population, as well as those by area of reporting, were calculated using the mid-year estimates provided by the ONS. Average annual rates per 100,000 for the three-year period were calculated by dividing the numerator (the number of TB notifications in the three-year period) by the denominator (the sum of the mid-year population estimates for the same three-year period) and multiplying by 100,000. A 95% confidence interval for incidence was obtained assuming a Poisson distribution.

For the purposes of TB outcome reporting, the drug sensitive cohort is defined as all TB cases, excluding those with multi-drug resistant/rifampicin resistant TB (MDR/RR-TB) (initial or acquired), and those treated with a second line regimen for MDR/RR-TB. TB outcomes are reported at 12 months for drug sensitive cases with an expected duration of treatment less than 12 months. This group excludes cases with CNS disease, who have an expected duration of treatment of 12 months. In addition, those with spinal,

cryptic disseminated or miliary disease are excluded from this group, as CNS involvement cannot be reliably ruled out for the purposes of reporting. The last recorded outcome is reported for the entire drug sensitive cohort.

Rates are presented from 2000 to 2016; all other breakdowns are presented for the past ten years.

Statistical analysis was carried out using Stata 13.

Glossary

Acquired resistance: resistance identified on repeat culture after three months of the first specimen date. Cases with a change from a sensitive to resistant result following treatment start are reclassified as acquired resistance, even if this is within the three month period

CI: confidence interval (95% confidence intervals used)

DR cohort: Drug resistant cohort is defined as cases that are culture confirmed with initial and/or acquired multi-drug resistant/rifampicin resistant TB (MDR/RR-TB), as well as those treated with a second line regimen for MDR/RR-TB without phenotypic DST results.

ESMI: Enhanced Surveillance of Mycobacterial Infections

ETS: Enhanced Tuberculosis Surveillance system

Initial resistance: a cultured isolate resistant to a particular drug within three months of the first specimen date

Last recorded outcome: Last known outcome, irrespective of when it occurred.

LTBR: London TB Register

MDR-TB: Multi-drug resistant TB is defined as resistance to at least isoniazid and rifampicin, with or without resistance to other drugs

MDR/RR-TB: Multi-drug resistant/Rifampicin resistant TB is defined as resistance to rifampicin including MDR-TB cases

ONS: Office for National Statistics

XDR-TB: Extensively-drug resistant TB is defined as resistance to isoniazid and rifampicin (MDR-TB), at least one injectable agent (capreomycin, kanamycin or amikacin) and at least one fluoroquinolone (moxifloxacin, ofloxacin, ciprofloxacin)

Table 1: Number of TB case notifications, rates and annual percentage change, UK, 2000-2016

Year	Number of cases	Rate per 100,000 (95% CI)	Annual change in case numbers (%)	Annual change in rate (%)
2000	6,686	11.4 (11.1 - 11.6)	-	-
2001	6,760	11.4 (11.2 - 11.7)	1.1%	0.0%
2002	7,291	12.3 (12.0 - 12.6)	7.9%	7.9%
2003	7,219	12.1 (11.8 - 12.4)	-1.0%	-1.6%
2004	7,589	12.7 (12.4 - 12.9)	5.1%	5.0%
2005	8,283	13.7 (13.4 - 14.0)	9.1%	7.9%
2006	8,307	13.7 (13.4 - 14.0)	0.3%	0.0%
2007	8,259	13.5 (13.2 - 13.8)	-0.6%	-1.5%
2008	8,491	13.7 (13.4 - 14.0)	2.8%	1.5%
2009	8,870	14.2 (14.0 - 14.5)	4.5%	3.6%
2010	8,397	13.4 (13.1 - 13.7)	-5.3%	-5.6%
2011	8,919	14.1 (13.8 - 14.4)	6.2%	5.2%
2012	8,711	13.7 (13.4 - 14.0)	-2.3%	-2.8%
2013	7,868	12.3 (12.0 - 12.5)	-9.7%	-10.2%
2014	7,049	10.9 (10.7 - 11.2)	-10.4%	-11.4%
2015	6,234	9.6 (9.3 - 9.8)	-11.6%	-11.9%
2016	6,175	9.4 (9.2 - 9.6)	-0.9%	-2.1%

CI - confidence interval

Between 2000 and 2011, there was an overall increase in the number of cases and rate of TB in the UK, with some annual fluctuations. Between 2015 and 2016, there was a 1% decline in the number of cases (2015: 6,234 versus 2016: 6,175). In 2016, the rate of TB was 9.4 per 100,000 (95% CI 9.2-9.6), compared with 9.6 per 100,000 (95% CI 9.3-9.8) in 2015. This is in contrast to previous years (2013 to 2015), where there was an annual decline of $\geq 10\%$. The number and rate of TB cases in 2016 was the lowest since data from enhanced TB surveillance was first available in 2000.

Table 2: Number of TB case notifications and rates by country, UK, 2000-2016

Year	Country									
	England		Wales		Northern Ireland		Scotland		UK	
	Number of cases	Rate per 100,000 (95% CI)	Number of cases	Rate per 100,000 (95% CI)	Number of cases	Rate per 100,000 (95% CI)	Number of cases	Rate per 100,000 (95% CI)	Number of cases	Rate per 100,000 (95% CI)
2000	6,044	12.3 (12.0 - 12.6)	182	6.3 (5.4 - 7.2)	57	3.4 (2.6 - 4.4)	403	8.0 (7.2 - 8.8)	6,686	11.4 (11.1 - 11.6)
2001	6,169	12.5 (12.2 - 12.8)	183	6.3 (5.4 - 7.3)	57	3.4 (2.6 - 4.4)	351	6.9 (6.2 - 7.7)	6,760	11.4 (11.2 - 11.7)
2002	6,675	13.4 (13.1 - 13.8)	155	5.3 (4.5 - 6.2)	67	3.9 (3.1 - 5.0)	394	7.8 (7.0 - 8.6)	7,291	12.3 (12.0 - 12.6)
2003	6,631	13.3 (13.0 - 13.6)	164	5.6 (4.8 - 6.5)	57	3.3 (2.5 - 4.3)	367	7.2 (6.5 - 8.0)	7,219	12.1 (11.8 - 12.4)
2004	6,929	13.8 (13.5 - 14.1)	187	6.3 (5.4 - 7.3)	81	4.7 (3.8 - 5.9)	392	7.7 (7.0 - 8.5)	7,589	12.7 (12.4 - 12.9)
2005	7,658	15.1 (14.8 - 15.5)	185	6.2 (5.4 - 7.2)	75	4.3 (3.4 - 5.4)	365	7.1 (6.4 - 7.9)	8,283	13.7 (13.4 - 14.0)
2006	7,682	15.1 (14.7 - 15.4)	183	6.1 (5.3 - 7.1)	61	3.5 (2.7 - 4.5)	381	7.4 (6.7 - 8.2)	8,307	13.7 (13.4 - 14.0)
2007	7,577	14.7 (14.4 - 15.1)	204	6.8 (5.9 - 7.8)	69	3.9 (3.0 - 5.0)	409	7.9 (7.2 - 8.7)	8,259	13.5 (13.2 - 13.8)
2008	7,809	15.1 (14.7 - 15.4)	169	5.6 (4.8 - 6.5)	66	3.7 (2.9 - 4.7)	447	8.6 (7.8 - 9.4)	8,491	13.7 (13.4 - 14.0)
2009	8,112	15.5 (15.2 - 15.9)	213	7.0 (6.1 - 8.0)	59	3.3 (2.5 - 4.2)	486	9.3 (8.5 - 10.2)	8,870	14.2 (14.0 - 14.5)
2010	7,676	14.6 (14.3 - 14.9)	152	5.0 (4.2 - 5.8)	66	3.7 (2.8 - 4.7)	503	9.6 (8.7 - 10.4)	8,397	13.4 (13.1 - 13.7)
2011	8,280	15.6 (15.3 - 15.9)	131	4.3 (3.6 - 5.1)	61	3.4 (2.6 - 4.3)	447	8.4 (7.7 - 9.3)	8,919	14.1 (13.8 - 14.4)
2012	8,083	15.1 (14.8 - 15.4)	136	4.4 (3.7 - 5.2)	87	4.8 (3.8 - 5.9)	405	7.6 (6.9 - 8.4)	8,711	13.7 (13.4 - 14.0)
2013	7,263	13.5 (13.2 - 13.8)	142	4.6 (3.9 - 5.4)	73	4.0 (3.1 - 5.0)	390	7.3 (6.6 - 8.1)	7,868	12.3 (12.0 - 12.5)
2014	6,472	11.9 (11.6 - 12.2)	114	3.7 (3.0 - 4.4)	95	5.2 (4.2 - 6.3)	368	6.9 (6.2 - 7.6)	7,049	10.9 (10.7 - 11.2)
2015	5,727	10.5 (10.2 - 10.7)	116	3.7 (3.1 - 4.5)	61	3.3 (2.5 - 4.2)	330	6.1 (5.5 - 6.8)	6,234	9.6 (9.3 - 9.8)
2016	5,664	10.2 (10.0 - 10.5)	106	3.4 (2.8 - 4.1)	85	4.6 (3.6 - 5.6)	320	5.9 (5.3 - 6.6)	6,175	9.4 (9.2 - 9.6)

CI - confidence interval

The majority of TB cases in the UK occur in England, and the rate of TB in England was considerably higher than in the devolved administrations. There was a small decline in the number of cases between 2015 and 2016 in England. In 2016, the rate of TB in England was 10.2 per 100,000 (95% CI 10.0-10.5), compared with 10.5 per 100,000 (95% CI 10.2-10.7) in 2015. This is in contrast to previous three years, where there was an annual decline of $\geq 10\%$. In Wales, although the number of cases and rate of TB has fluctuated annually there has been an overall decrease, with the rate of TB almost halving since 2000. Northern Ireland has both a small number of cases and low rate of TB, with annual fluctuations. Following an overall increase in the number of cases and rate of TB in Scotland between 2000 and 2010, there has since been an annual decrease.

Table 3: Number of TB case notifications and rates by PHE Centre, England, 2016

PHE Centre*	Number of cases	Rate per 100,000 (95% CI)
London	2,210	25.1 (24.1 - 26.2)
West Midlands	721	12.4 (11.5 - 13.4)
North West	600	8.3 (7.7 - 9.0)
South East	567	6.5 (5.9 - 7.0)
East of England	436	6.8 (6.2 - 7.5)
Yorkshire and the Humber	425	7.8 (7.1 - 8.6)
East Midlands	342	7.2 (6.5 - 8.0)
South West	239	4.3 (3.8 - 4.9)
North East	124	4.7 (3.9 - 5.6)

* Ordered by highest to lowest number of cases
 CI - confidence interval

In 2016, London PHE Centre (PHEC) accounted for the highest number of TB cases in England, followed by the West Midlands PHEC. The rate of TB per 100,000 population in London PHEC was nearly six times higher than the rate in the South West PHEC, which had the lowest rate.

Table 4: Three-year average number of TB case notifications and rates by upper tier local authority and local authority district, England, 2014-2016

PHE Centre*	Upper tier local authority and local authority district**	Average annual number of cases[#]	Average annual rate per 100,000 (95% CI)
London		2,345	27.1 (26.4-27.7)
	Barking and Dagenham	58	28.7 (24.6-33.3)
	Barnet	74	19.5 (17.0-22.2)
	Bexley	22	9.1 (7.0-11.6)
	Brent	187	57.8 (53.1-62.7)
	Bromley	21	6.6 (5.1-8.4)
	Camden	43	18.0 (15.0-21.4)
	City of London	0	3.8 (0.1-21.2)
	Croydon	84	22.1 (19.4-25.0)
	Ealing	162	47.3 (43.2-51.7)
	Enfield	69	20.9 (18.2-24.0)
	Greenwich	83	30.2 (26.6-34.2)
	Hackney	68	25.4 (22.1-29.2)
	Hammersmith and Fulham	37	20.5 (16.8-24.7)
	Haringey	71	26.1 (22.7-29.9)
	Harrow	95	38.6 (34.2-43.3)
	Havering	24	9.8 (7.7-12.3)
	Hillingdon	102	34.4 (30.6-38.5)
	Hounslow	128	47.5 (42.9-52.6)
	Islington	49	21.6 (18.2-25.3)
	Kensington and Chelsea	26	16.4 (12.9-20.4)
	Kingston upon Thames	19	11.2 (8.5-14.4)
	Lambeth	65	20.1 (17.4-23.1)
	Lewisham	65	21.9 (18.9-25.2)
	Merton	48	23.5 (19.8-27.7)
	Newham	230	69.0 (64.0-74.4)
	Redbridge	123	41.5 (37.4-46.0)
	Richmond upon Thames	11	5.5 (3.7-7.7)
	Southwark	78	25.3 (22.2-28.8)
	Sutton	24	11.8 (9.2-14.9)
	Tower Hamlets	89	30.1 (26.6-33.9)
	Waltham Forest	90	33.0 (29.2-37.2)
	Wandsworth	54	17.1 (14.5-19.9)
	Westminster	44	18.1 (15.1-21.5)

PHE Centre*	Upper tier local authority and local authority district**	Average annual number of cases[#]	Average annual rate per 100,000 (95% CI)
West Midlands		732	12.7 (12.2-13.3)
	Birmingham	279	25.1 (23.4-26.9)
	Coventry	89	25.8 (22.8-29.1)
	Dudley	25	7.9 (6.2-9.9)
	Herefordshire, County of	3	1.6 (0.7-3.0)
	Sandwell	87	27.3 (24.1-30.8)
	Shropshire	9	2.8 (1.8-4.1)
	Solihull	14	6.5 (4.7-8.8)
	Staffordshire	35	4.1 (3.3-4.9)
	Cannock Chase	2	1.7 (0.5-3.9)
	East Staffordshire	8	6.9 (4.4-10.2)
	Lichfield	5	4.5 (2.5-7.6)
	Newcastle-under-Lyme	7	5.2 (3.2-8.1)
	South Staffordshire	3	3.0 (1.4-5.5)
	Stafford	7	5.0 (3.1-7.7)
	Staffordshire Moorlands	3	2.7 (1.2-5.4)
	Tamworth	1	1.7 (0.5-4.4)
	Stoke-on-Trent	30	11.8 (9.5-14.5)
	Telford and Wrekin	6	3.7 (2.2-5.8)
	Walsall	38	13.9 (11.5-16.7)
	Warwickshire	36	6.4 (5.3-7.8)
	North Warwickshire	2	2.7 (0.9-6.2)
	Nuneaton and Bedworth	12	9.5 (6.6-13.1)
	Rugby	8	7.4 (4.7-11.1)
	Stratford-on-Avon	2	1.9 (0.8-4.0)
	Warwick	12	8.6 (6.0-11.9)
	Wolverhampton	60	23.6 (20.2-27.3)
	Worcestershire	21	3.6 (2.8-4.6)
	Bromsgrove	3	3.1 (1.4-5.9)
	Malvern Hills	2	2.2 (0.7-5.1)
	Redditch	6	6.7 (3.9-10.7)
	Worcester	6	5.9 (3.5-9.3)
	Wychavon	3	2.2 (0.9-4.3)
	Wyre Forest	2	2.0 (0.7-4.4)

PHE Centre*	Upper tier local authority and local authority district**	Average annual number of cases [#]	Average annual rate per 100,000 (95% CI)
North West		603	8.4 (8.0-8.8)
	Blackburn with Darwen	36	24.3 (19.9-29.3)
	Blackpool	14	10.3 (7.4-13.8)
	Bolton	50	17.6 (14.9-20.7)
	Bury	18	9.4 (7.0-12.3)
	Cheshire East	16	4.2 (3.1-5.5)
	Cheshire West and Chester	10	3.0 (2.0-4.3)
	Cumbria	10	2.1 (1.4-2.9)
	Allerdale	3	3.1 (1.4-5.9)
	Barrow-in-Furness	2	2.5 (0.8-5.8)
	Carlisle	2	1.5 (0.5-3.6)
	Copeland	1	1.0 (0.1-3.5)
	Eden	0	0.6 (0.0-3.5)
	South Lakeland	3	2.9 (1.3-5.5)
	Halton	2	1.8 (0.7-3.8)
	Knowsley	2	1.6 (0.6-3.3)
	Lancashire	65	5.5 (4.7-6.3)
	Burnley	4	4.2 (2.1-7.5)
	Chorley	3	3.0 (1.4-5.4)
	Fylde	1	1.7 (0.5-4.4)
	Hyndburn	6	7.9 (4.7-12.3)
	Lancaster	5	3.3 (1.8-5.5)
	Pendle	13	14.8 (10.6-20.1)
	Preston	21	14.9 (11.4-19.0)
	Ribble Valley	1	2.3 (0.6-5.8)
	Rossendale	3	4.8 (2.3-8.8)
	South Ribble	4	3.3 (1.7-6.0)
	West Lancashire	2	1.5 (0.5-3.5)
	Wyre	1	1.2 (0.3-3.1)
	Liverpool	37	7.7 (6.4-9.3)
	Manchester	131	24.7 (22.3-27.3)
	Oldham	50	21.5 (18.2-25.3)
	Rochdale	32	14.9 (12.1-18.2)
	Salford	29	12.0 (9.6-14.7)
	Sefton	8	2.8 (1.8-4.2)
	St. Helens	3	1.7 (0.8-3.2)
	Stockport	15	5.3 (3.9-7.1)
	Tameside	19	8.7 (6.6-11.3)
	Trafford	24	10.4 (8.2-13.1)
	Warrington	9	4.2 (2.7-6.1)
	Wigan	13	4.1 (3.0-5.6)
	Wirral	10	3.0 (2.0-4.3)

PHE Centre*	Upper tier local authority and local authority district**	Average annual number of cases[#]	Average annual rate per 100,000 (95% CI)
South East		608	7.0 (6.7-7.3)
	Bracknell Forest	8	6.7 (4.3-10.0)
	Brighton and Hove	22	7.6 (5.9-9.7)
	Buckinghamshire	44	8.4 (7.0-9.9)
	Aylesbury Vale	12	6.2 (4.3-8.6)
	Chiltern	6	6.7 (4.0-10.5)
	South Bucks	7	9.6 (5.9-14.9)
	Wycombe	20	11.2 (8.5-14.4)
	East Sussex	23	4.2 (3.3-5.4)
	Eastbourne	7	6.5 (4.0-10.1)
	Hastings	7	8.0 (5.0-12.1)
	Lewes	3	3.0 (1.4-5.7)
	Rother	3	3.6 (1.7-6.6)
	Wealden	3	1.7 (0.7-3.4)
	Hampshire	54	4.0 (3.4-4.6)
	Basingstoke and Deane	12	6.9 (4.8-9.6)
	East Hampshire	2	1.7 (0.6-3.7)
	Eastleigh	3	2.1 (0.9-4.1)
	Fareham	2	2.0 (0.8-4.2)
	Gosport	1	0.8 (0.1-2.8)
	Hart	2	2.1 (0.8-4.6)
	Havant	3	2.4 (1.1-4.6)
	New Forest	3	1.9 (0.9-3.4)
	Rushmoor	20	20.6 (15.7-26.5)
	Test Valley	3	2.8 (1.3-5.1)
	Winchester	3	2.2 (1.0-4.4)
	Isle of Wight	2	1.7 (0.7-3.4)
	Kent	95	6.2 (5.5-7.0)
	Ashford	13	10.7 (7.6-14.6)
	Canterbury	9	5.4 (3.5-7.9)
	Dartford	9	8.3 (5.4-12.2)
	Dover	3	2.3 (1.0-4.6)
	Gravesham	18	17.0 (12.7-22.1)
	Maidstone	12	7.1 (4.9-9.9)
	Sevenoaks	4	3.4 (1.7-5.9)
	Shepway	5	4.5 (2.5-7.5)
	Swale	5	3.3 (1.8-5.5)
	Thanet	10	6.9 (4.6-9.9)
	Tonbridge and Malling	4	2.9 (1.5-5.2)
	Tunbridge Wells	5	4.6 (2.6-7.4)
	Medway	14	5.1 (3.7-6.8)

PHE Centre*	Upper tier local authority and local authority district**	Average annual number of cases[#]	Average annual rate per 100,000 (95% CI)
South East <i>continued</i>	Oxfordshire	54	8.0 (6.8-9.3)
	Cherwell	14	9.9 (7.1-13.3)
	Oxford	28	17.3 (13.8-21.5)
	South Oxfordshire	4	2.7 (1.3-4.8)
	Vale of White Horse	4	3.2 (1.6-5.5)
	West Oxfordshire	5	4.3 (2.4-7.2)
	Portsmouth	13	6.1 (4.4-8.4)
	Reading	43	26.4 (22.0-31.4)
	Slough	61	41.8 (36.0-48.3)
	Southampton	29	11.5 (9.2-14.2)
	Surrey	69	5.9 (5.1-6.7)
	Elmbridge	5	4.0 (2.3-6.5)
	Epsom and Ewell	6	8.0 (4.8-12.5)
	Guildford	7	5.0 (3.2-7.6)
	Mole Valley	2	2.3 (0.9-5.1)
	Reigate and Banstead	11	7.9 (5.4-11.0)
	Runnymede	6	6.6 (3.9-10.6)
	Spelthorne	8	8.1 (5.2-12.1)
	Surrey Heath	5	6.1 (3.5-9.8)
	Tandridge	2	2.7 (1.1-5.6)
	Waverley	4	3.2 (1.7-5.7)
	Woking	11	11.1 (7.6-15.5)
	West Berkshire	6	3.8 (2.3-6.1)
	West Sussex	41	4.9 (4.1-5.9)
	Adur	0	0.0 (0.0-0.0)
	Arun	6	3.9 (2.3-6.1)
	Chichester	5	4.6 (2.6-7.4)
	Crawley	18	16.6 (12.5-21.6)
	Horsham	3	2.0 (0.8-3.9)
	Mid Sussex	4	2.7 (1.4-4.8)
	Worthing	5	4.6 (2.6-7.7)
	Windsor and Maidenhead	13	8.6 (6.1-11.7)
	Wokingham	17	10.8 (8.1-14.2)

PHE Centre*	Upper tier local authority and local authority district**	Average annual number of cases[#]	Average annual rate per 100,000 (95% CI)
East of England		420	6.6 (6.3-7.0)
	Bedford	20	12.0 (9.2-15.5)
	Cambridgeshire	36	5.6 (4.6-6.8)
	Cambridge	13	10.0 (7.1-13.6)
	East Cambridgeshire	3	3.1 (1.3-6.0)
	Fenland	5	5.4 (3.1-8.7)
	Huntingdonshire	8	4.6 (2.9-6.8)
	South Cambridgeshire	7	4.7 (3.0-7.2)
	Central Bedfordshire	7	2.4 (1.5-3.8)
	Essex	60	4.2 (3.6-4.8)
	Basildon	14	7.7 (5.5-10.4)
	Braintree	3	2.0 (0.9-3.8)
	Brentwood	6	7.5 (4.3-11.9)
	Castle Point	2	2.6 (1.1-5.4)
	Chelmsford	6	3.5 (2.1-5.5)
	Colchester	7	3.6 (2.2-5.6)
	Epping Forest	5	4.1 (2.4-6.7)
	Harlow	8	9.0 (5.7-13.5)
	Maldon	2	2.6 (0.9-6.2)
	Rochford	2	2.0 (0.6-4.6)
	Tendring	3	2.4 (1.1-4.3)
	Uttlesford	3	3.5 (1.6-6.7)
	Hertfordshire	87	7.4 (6.6-8.4)
	Broxbourne	7	6.9 (4.2-10.7)
	Dacorum	6	4.2 (2.5-6.5)
	East Hertfordshire	6	4.4 (2.6-6.8)
	Hertsmere	11	11.0 (7.6-15.4)
	North Hertfordshire	7	5.3 (3.3-8.1)
	St Albans	7	4.8 (3.0-7.3)
	Stevenage	8	9.2 (5.9-13.8)
	Three Rivers	6	6.6 (3.9-10.4)
	Watford	17	17.7 (13.2-23.2)
	Welwyn Hatfield	11	9.2 (6.4-13.0)
	Luton	62	29.0 (24.9-33.4)
	Milton Keynes	24	9.0 (7.1-11.4)

PHE Centre*	Upper tier local authority and local authority district**	Average annual number of cases [#]	Average annual rate per 100,000 (95% CI)
East of England <i>continued</i>	Norfolk	37	4.1 (3.4-5.0)
	Breckland	3	2.0 (0.8-3.9)
	Broadland	1	0.5 (0.1-1.9)
	Great Yarmouth	12	11.8 (8.2-16.4)
	King's Lynn and West Norfolk	7	4.6 (2.9-7.1)
	North Norfolk	1	1.0 (0.2-2.8)
	Norwich	11	7.9 (5.4-11.1)
	South Norfolk	3	2.0 (0.9-4.0)
	Peterborough	38	19.8 (16.3-23.7)
	Southend-on-Sea	11	6.0 (4.1-8.4)
	Suffolk	30	4.0 (3.3-5.0)
	Babergh	2	2.6 (1.1-5.4)
	Forest Heath	2	3.7 (1.5-7.6)
	Ipswich	10	7.6 (5.2-10.8)
	Mid Suffolk	3	3.0 (1.4-5.7)
	St Edmundsbury	6	5.0 (2.9-8.1)
	Suffolk Coastal	2	1.6 (0.6-3.5)
	Waveney	4	3.7 (2.0-6.4)
	Thurrock	9	5.4 (3.6-7.9)
	Yorkshire and the Humber	459	8.5 (8.1-9.0)
	Barnsley	10	4.0 (2.7-5.8)
Bradford	96	18.1 (16.0-20.3)	
Calderdale	16	7.8 (5.8-10.4)	
Doncaster	20	6.6 (5.0-8.4)	
East Riding of Yorkshire	6	1.9 (1.1-2.9)	
Kingston upon Hull, City of	16	6.2 (4.6-8.2)	
Kirklees	72	16.6 (14.4-19.0)	
Leeds	89	11.5 (10.2-13.0)	
North East Lincolnshire	7	4.2 (2.6-6.5)	
North Lincolnshire	7	4.3 (2.7-6.5)	
North Yorkshire	14	2.4 (1.7-3.2)	
Craven	2	3.0 (1.0-7.0)	
Hambleton	2	1.8 (0.6-4.3)	
Harrogate	3	2.1 (1.0-3.9)	
Richmondshire	3	5.0 (2.2-9.9)	
Ryedale	1	1.3 (0.2-4.5)	
Scarborough	3	2.5 (1.1-4.9)	
Selby	2	1.9 (0.6-4.5)	
Rotherham	13	5.1 (3.7-7.0)	
Sheffield	73	12.8 (11.1-14.6)	
Wakefield	17	5.1 (3.8-6.7)	
York	3	1.3 (0.6-2.5)	

PHE Centre*	Upper tier local authority and local authority district**	Average annual number of cases[#]	Average annual rate per 100,000 (95% CI)
East Midlands		366	7.8 (7.4-8.3)
	Derby	33	13.1 (10.7-15.9)
	Derbyshire	18	2.3 (1.8-3.0)
	Amber Valley	4	3.0 (1.5-5.3)
	Bolsover	1	1.7 (0.5-4.4)
	Chesterfield	4	3.8 (2.0-6.7)
	Derbyshire Dales	1	1.4 (0.3-4.1)
	Erewash	3	2.9 (1.4-5.4)
	High Peak	2	2.2 (0.8-4.8)
	North East Derbyshire	1	1.3 (0.4-3.4)
	South Derbyshire	2	1.7 (0.5-3.9)
	Leicester	132	38.5 (34.8-42.5)
	Leicestershire	22	3.3 (2.6-4.2)
	Blaby	3	3.1 (1.4-5.9)
	Charnwood	6	3.2 (1.9-5.1)
	Harborough	3	3.7 (1.8-6.9)
	Hinckley and Bosworth	2	1.5 (0.5-3.6)
	Melton	0	0.0 (0.0-0.0)
	North West Leicestershire	3	2.7 (1.2-5.4)
	Oadby and Wigston	6	10.7 (6.4-17.0)
	Lincolnshire	34	4.6 (3.7-5.5)
	Boston	8	12.4 (8.1-18.4)
	East Lindsey	6	4.3 (2.6-6.9)
	Lincoln	4	4.1 (2.1-7.2)
	North Kesteven	3	2.4 (1.0-4.7)
	South Holland	4	4.0 (2.0-7.2)
	South Kesteven	7	4.8 (2.9-7.4)
	West Lindsey	2	2.5 (1.0-5.2)
	Northamptonshire	48	6.7 (5.6-7.9)
	Corby	4	6.0 (3.1-10.5)
	Daventry	2	2.5 (0.9-5.4)
	East Northamptonshire	3	3.7 (1.8-6.8)
	Kettering	3	3.1 (1.4-5.8)
	Northampton	27	12.1 (9.6-15.1)
	South Northamptonshire	2	2.6 (1.1-5.4)
	Wellingborough	7	8.6 (5.3-13.3)

PHE Centre*	Upper tier local authority and local authority district**	Average annual number of cases[#]	Average annual rate per 100,000 (95% CI)
East Midlands <i>continued</i>	Nottingham	50	15.8 (13.3-18.5)
	Nottinghamshire	26	3.3 (2.6-4.1)
	Ashfield	6	4.9 (2.9-7.7)
	Bassetlaw	2	1.5 (0.5-3.4)
	Broxtowe	4	3.9 (2.1-6.6)
	Gedling	5	4.6 (2.6-7.5)
	Mansfield	4	3.4 (1.7-6.2)
	Newark and Sherwood	2	2.0 (0.8-4.1)
	Rushcliffe	3	2.6 (1.2-5.0)
	Rutland	1	3.5 (1.0-8.9)
South West		280	5.1 (4.8-5.5)
	Bath and North East Somerset	12	6.5 (4.5-9.0)
	Bournemouth	12	6.0 (4.2-8.3)
	Bristol, City of	81	18.1 (15.9-20.6)
	Cornwall	13	2.3 (1.6-3.2)
	Devon	27	3.5 (2.8-4.3)
	East Devon	2	1.7 (0.7-3.5)
	Exeter	5	4.2 (2.4-6.8)
	Mid Devon	2	2.5 (0.9-5.5)
	North Devon	3	3.2 (1.5-6.0)
	South Hams	3	3.2 (1.4-6.2)
	Teignbridge	9	7.0 (4.6-10.2)
	Torrige	1	1.5 (0.3-4.4)
	West Devon	2	3.1 (1.0-7.1)
	Dorset	9	2.2 (1.5-3.2)
	Christchurch	1	2.0 (0.4-5.9)
	East Dorset	2	2.3 (0.8-4.9)
	North Dorset	1	1.4 (0.3-4.1)
	Purbeck	1	2.2 (0.4-6.3)
	West Dorset	1	1.3 (0.4-3.4)
	Weymouth and Portland	3	4.6 (2.1-8.7)
	Gloucestershire	24	3.8 (3.0-4.8)
	Cheltenham	5	4.0 (2.2-6.7)
	Cotswold	1	1.2 (0.2-3.4)
	Forest of Dean	1	1.6 (0.4-4.0)
	Gloucester	9	7.3 (4.9-10.6)
	Stroud	4	3.2 (1.6-5.6)
	Tewkesbury	4	4.2 (2.1-7.5)
	Isles of Scilly	0	0.0 (0.0-0.0)
	North Somerset	8	3.8 (2.4-5.7)
	Plymouth	16	6.0 (4.4-7.9)
	Poole	5	3.5 (2.0-5.7)

PHE Centre*	Upper tier local authority and local authority district**	Average annual number of cases [#]	Average annual rate per 100,000 (95% CI)
South West	Somerset	10	1.9 (1.3-2.7)
<i>continued</i>	Mendip	3	3.0 (1.4-5.5)
	Sedgemoor	2	1.7 (0.6-3.6)
	South Somerset	3	2.0 (1.0-3.7)
	Taunton Deane	2	1.5 (0.5-3.4)
	West Somerset	0	0.0 (0.0-0.0)
	South Gloucestershire	18	6.7 (5.0-8.7)
	Swindon	23	10.8 (8.4-13.6)
	Torbay	7	5.0 (3.1-7.7)
	Wiltshire	15	3.0 (2.2-4.1)
North East		140	5.3 (4.8-5.9)
	County Durham	9	1.8 (1.2-2.6)
	Darlington	6	5.7 (3.4-9.0)
	Gateshead	15	7.5 (5.4-10.0)
	Hartlepool	3	3.6 (1.7-6.6)
	Middlesbrough	14	9.8 (7.0-13.3)
	Newcastle upon Tyne	41	14.1 (11.7-16.8)
	North Tyneside	7	3.5 (2.1-5.3)
	Northumberland	8	2.4 (1.5-3.6)
	Redcar and Cleveland	4	3.0 (1.5-5.2)
	South Tyneside	9	5.8 (3.8-8.5)
	Stockton-on-Tees	11	5.5 (3.7-7.7)
	Sunderland	13	4.8 (3.4-6.5)

* Ordered by decreasing total number of cases in 2016

** Those highlighted in bold are upper-tier local authority only, those indented are local authority district only, and those neither highlighted nor indented are both an upper tier local authority and a local authority district

[#] Average number of cases in a local authority district may not be the same as the sum of the average number of cases in the corresponding upper tier local authority due to rounding

CI - confidence intervals

Table 5: Number and proportion of culture confirmed TB cases and pulmonary TB cases by country, UK, 2007-2016

Year	Country																			
	England				Wales				Northern Ireland				Scotland				UK			
	Culture confirmed TB cases		Culture confirmed pulmonary TB cases		Culture confirmed TB cases		Culture confirmed pulmonary TB cases		Culture confirmed TB cases		Culture confirmed pulmonary TB cases		Culture confirmed TB cases		Culture confirmed pulmonary TB cases		Culture confirmed TB cases		Culture confirmed pulmonary TB cases	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
2007	4,448	58.7	2,850	68.7	128	62.7	93	68.9	57	82.6	43	93.5	288	70.4	212	76.3	4,921	59.6	3,198	69.4
2008	4,537	58.1	2,904	67.8	102	60.4	73	71.6	50	75.8	30	81.1	317	70.9	212	79.7	5,006	59.0	3,219	68.6
2009	4,668	57.5	3,006	68.1	119	55.9	80	63.5	49	83.1	38	86.4	325	66.9	215	74.4	5,161	58.2	3,339	68.5
2010	4,609	60.0	2,867	70.4	107	70.4	72	77.4	54	81.8	35	94.6	325	64.6	228	70.2	5,095	60.7	3,202	70.8
2011	5,032	60.8	3,076	71.7	94	71.8	56	78.9	47	77.0	38	80.9	295	66.0	195	68.9	5,468	61.3	3,365	71.7
2012	4,896	60.6	2,950	70.4	105	77.2	63	80.8	53	60.9	36	76.6	276	68.1	165	75.0	5,330	61.2	3,214	70.9
2013	4,393	60.5	2,712	72.9	87	61.3	62	73.8	45	61.6	29	69.0	241	61.8	156	71.9	4,766	60.6	2,959	72.8
2014	3,924	60.6	2,488	73.2	81	71.1	55	85.9	64	67.4	48	70.6	238	64.7	164	66.9	4,307	61.1	2,755	72.9
2015	3,492	61.0	2,244	74.1	80	69.0	59	90.8	39	63.9	33	84.6	212	64.2	132	74.6	3,823	61.3	2,468	74.6
2016	3,570	63.0	2,310	76.0	80	75.5	61	83.6	54	63.5	37	77.1	194	60.6	120	62.5	3,898	63.1	2,528	75.4

Between 2007 and 2016, the proportion of TB cases that were culture confirmed in the UK gradually increased to the highest level of 63% in 2016. Overall, culture confirmation was higher in pulmonary TB cases, and in 2016, over three-quarters of pulmonary TB cases were culture confirmed in the UK. The proportion of TB cases culture confirmed was generally higher in Wales (range 56-77%), Northern Ireland (range 61-83%) and Scotland (61-71%) compared with England (range 58%-63%).

Table 6: Number and proportion of TB cases with drug resistance by country, UK, 2000-2016

Year	Country																										
	England					Wales					Northern Ireland					Scotland					UK						
	Isoniazid resistance without MDR-TB cases*		MDR/RR-TB cases**		DR cohort~	Isoniazid resistance without MDR-TB cases*		MDR/RR-TB cases**		DR cohort~	Isoniazid resistance without MDR-TB cases*		MDR/RR-TB cases**		DR cohort~	Isoniazid resistance without MDR-TB cases*		MDR/RR-TB cases**		DR cohort~	Isoniazid resistance without MDR-TB cases*		MDR/RR-TB cases**		XDR-TB cases#	DR cohort~	
	n	%	n	%	N	n	%	n	%	N	n	%	n	%	N	n	%	n	%	N	n	%	n	%	n	%	N
2000	150	5.4	41	1.5	41	2	1.9	0	0.0	0	0	0.0	0	0.0	0	11	3.8	0	0.0	0	163	5.1	41	1.3	0	0.00	41
2001	184	5.9	32	1.0	35	2	2.6	3	3.9	3	0	0.0	1	2.7	1	7	2.8	2	0.8	2	193	5.5	38	1.1	0	0.00	41
2002	239	6.3	45	1.2	49	6	7.5	1	1.3	1	2	5.6	0	0.0	0	9	3.5	1	0.4	1	256	6.1	47	1.1	0	0.00	51
2003	233	6.1	68	1.8	70	6	5.5	3	2.8	3	1	3.2	0	0.0	0	8	3.0	1	0.4	1	248	5.9	72	1.7	1	0.02	74
2004	251	6.2	61	1.5	71	6	5.9	2	2.0	2	1	1.6	1	1.6	1	14	4.6	1	0.3	1	272	6.0	65	1.4	0	0.00	75
2005	281	6.2	56	1.2	62	1	0.8	2	1.7	2	0	0.0	1	2.2	1	11	4.1	0	0.0	0	293	5.9	59	1.2	0	0.00	65
2006	283	6.1	74	1.6	80	5	3.9	1	0.8	2	1	2.2	2	4.4	2	12	4.2	2	0.7	2	301	5.9	79	1.6	0	0.00	86
2007	256	5.8	62	1.4	71	10	7.8	4	3.1	4	2	3.5	3	5.3	3	8	2.8	5	1.7	5	276	5.7	74	1.5	0	0.00	83
2008	216	4.8	68	1.5	78	3	3.0	3	3.0	3	2	4.0	1	2.0	1	12	3.8	3	1.0	3	233	4.7	75	1.5	2	0.04	85
2009	268	5.8	70	1.5	77	7	5.9	1	0.8	1	0	0.0	0	0.0	0	18	5.6	2	0.6	2	293	5.8	73	1.4	2	0.04	80
2010	227	5.0	75	1.6	79	6	5.7	0	0.0	0	2	3.9	1	2.0	1	15	4.6	1	0.3	1	250	5.0	77	1.5	3 [§]	0.06	81
2011	295	5.9	89	1.8	95	1	1.1	2	2.1	2	1	2.3	2	4.5	2	18	6.1	2	0.7	2	315	5.8	95	1.8	6	0.11	101
2012	253	5.2	87	1.8	94	9	8.7	1	1.0	1	3	5.7	0	0.0	0	13	4.7	2	0.7	2	278	5.3	90	1.7	2	0.04	97
2013	237	5.5	78	1.8	85	6	6.9	2	2.3	3	6	13.3	0	0.0	0	11	4.7	5	2.1	5	260	5.5	85	1.8	3	0.06	93
2014	215	5.5	56	1.4	69	7	8.6	3	3.7	3	3	4.7	1	1.6	1	15	8.0	1	0.5	1	240	5.7	61	1.4	3	0.07	74
2015	191	5.5	53	1.5	67	5	6.3	1	1.3	1	3	7.7	0	0.0	0	8	4.8	2	1.2	2	207	5.5	56	1.5	10	0.27	70
2016	192	5.5	59	1.7	68	2	2.5	2	2.5	4	2	3.8	1	1.9	1	3	2.1	1	0.7	1	199	5.3	63	1.7	7	0.18	74
Total	3,971	5.7	1,074	1.5	1,191	84	4.9	31	1.8	35	29	3.7	14	1.8	14	193	4.3	31	0.7	31	4,277	5.6	1,150	1.5	39	0.05	1,271

* Cases with phenotypic DST results for at least isoniazid and rifampicin who are resistant to isoniazid without MDR-TB

** Cases with phenotypic DST results for at least isoniazid and rifampicin who are resistant to rifampicin, including those with MDR-TB

Cases with phenotypic DST results for at least isoniazid and rifampicin who are resistant to isoniazid and rifampicin, at least one injectable agent, and at least one fluoroquinolone

~ The drug resistant (DR) cohort includes cases with phenotypic DST results for at least isoniazid and rifampicin who have initial or acquired MDR/RR-TB, as well as those treated with a second line regimen for MDR/RR-TB (without phenotypic DST results). It should be noted that the DR cohort for Scotland only includes those with phenotypic DST results confirming MDR/RR-TB, as information on enhanced surveillance for those treated with a second line regimen for MDR/RR-TB (without phenotypic DST results) was not available.

§ 1 of the XDR-TB cases was notified in Northern Ireland, the rest were all notified in England

The proportion of culture confirmed TB cases with isoniazid resistance without MDR-TB and MDR/RR-TB has remained stable in the UK over the past seventeen years. Between 2000 and 2011, there was an overall increase in the number of cases in the drug resistant cohort, with some annual fluctuations. From 2011 onwards, there has been a decline in the number of cases in this cohort with 74 reported in 2016. The majority of MDR/RR-TB cases in the UK were from England. The number of XDR-TB cases in the UK has increased in recent years, with 7 confirmed cases notified in 2016, all of which were notified in England.

Table 7: TB outcome at 12 months for drug sensitive TB cases with expected treatment duration <12 months* by country, UK, 2015

Country	Completed		Died		Lost to follow-up		Still on treatment		Stopped		Not evaluated**		Total
	n	%	n	%	n	%	n	%	n	%	n	%	n
England	4,168	83.4	263	5.3	200	4.0	267	5.3	56	1.1	45	0.9	4,999
Wales	85	84.2	4	4.0	4	4.0	5	5.0	1	1.0	2	2.0	101
Northern Ireland	41	85.4	2	4.2	2	4.2	3	6.3	0	0.0	0	0.0	48
Scotland	194	66.9	22	7.6	10	3.4	9	3.1	5	1.7	50	17.2	290
UK	4,488	82.5	291	5.4	216	4.0	284	5.2	62	1.1	97	1.8	5,438

* Excludes initial and acquired resistance to rifampicin and MDR-TB cases and those treated with an MDR-TB regimen. Also excludes those with CNS, spinal, miliary or cryptic disseminated TB

** Not evaluated includes missing, unknown and transferred out

For drug sensitive TB cases notified in 2015 with an expected treatment duration of less than 12 months, treatment completion at 12 months varied by country; the highest proportion being in Northern Ireland. Overall, 5% of TB cases died in the UK, and 4% were lost to follow up. It should be noted that there were known reporting and coding issues within the 2015 outcome data for Scotland, therefore figures should be interpreted with caution.

Table 8: Treatment completion at 12 months for drug sensitive TB cases with expected treatment duration <12 months* by country, UK, 2006-2015

Country	2006		2007		2008		2009		2010		2011		2012		2013		2014		2015	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
England	5,214	75.5	5,290	78.2	5,602	80.3	5,917	81.9	5,650	82.9	6,025	82.1	6,016	83.8	5,502	85.6	4,847	84.8	4,168	83.4
Wales	115	66.9	113	60.8	118	78.1	148	77.5	107	77.5	90	76.3	90	75.0	101	83.5	76	82.6	85	84.2
Northern Ireland	28	50.0	46	73.0	36	61.0	41	75.9	39	67.2	42	79.2	55	70.5	43	74.1	74	85.1	41	85.4
Scotland	262	71.8	281	72.4	284	67.9	318	69.9	362	77.0	322	75.9	303	79.3	287	81.5	257	75.1	194	66.9
UK	5,619	75.0	5,730	77.4	6,040	79.4	6,424	81.1	6,158	82.3	6,479	81.7	6,464	83.3	5,933	85.3	5,254	84.3	4,488	82.5

* Excludes initial and acquired resistance to rifampicin and MDR-TB cases and those treated with an MDR-TB regimen. Also excludes those with CNS, spinal, miliary or cryptic disseminated TB

Treatment completion at 12 months for drug sensitive TB cases with an expected treatment duration of less than 12 months improved between 2006 and 2013 (with some annual fluctuations), and has since declined slightly. Due to small numbers of cases in Northern Ireland, Scotland and Wales, there are annual fluctuations in the proportion of cases completing treatment. It should be noted that there were known reporting and coding issues within the 2013 to 2015 outcome data for Scotland, therefore figures should be interpreted with caution.

Table 9: Last recorded TB outcome for the entire drug sensitive TB cohort* by country, UK, 2015

Country	Completed		Died		Lost to follow-up		Still on treatment		Stopped		Not evaluated**		Total n
	n	%	n	%	n	%	n	%	n	%	n	%	
England	4,827	85.3	343	6.1	239	4.2	136	2.4	59	1.0	56	1.0	5,660
Wales	99	86.1	7	6.1	4	3.5	2	1.7	1	0.9	2	1.7	115
Northern Ireland	51	83.6	3	4.9	3	4.9	4	6.6	0	0.0	0	0.0	61
Scotland	222	67.7	24	7.3	10	3.0	8	2.4	7	2.1	57	17.4	328
UK	5,199	84.3	377	6.1	256	4.2	150	2.4	67	1.1	115	1.9	6,164

* Excludes initial and acquired resistance to rifampicin and MDR-TB cases and those treated with an MDR-TB regimen

** Not evaluated includes missing, unknown and transferred out

For drug sensitive TB cases notified in 2015, the last recorded outcome varied by country; the highest proportion who completed treatment was in Wales. Overall, 377 (6%) cases had died, and 256 (4%) cases were lost to follow-up at the last recorded outcome in the UK. It should be noted that there were known reporting and coding issues within the 2015 outcome data for Scotland, therefore figures should be interpreted with caution.