

Supplementary Table S1. Outcome definitions for the included studies

No.	Contact person (ref.)	Cure	Treatment completed	Treatment Failure	Death	Loss to follow-up (default)	Relapse
1	Ahmad [1]	Laserson	Laserson	Laserson	Laserson	Laserson	
2	Ahuja [2]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
3	Anderson [3]	Not reported	Complete a full course of therapy within 12/24 months of starting treatment	Patients found to have stopped treatment (by choice) or for any other reason not mentioned below	Laserson	Unable to contact patient before end of treatment. Treatment outcome unknown	Laserson
4	Bang [4]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
5	Barry (California) [5]	See footnote: A	Laserson	See footnote: B	Laserson	Laserson	Laserson
6	Bonnet [6]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
7	Brode [7]	Laserson	Laserson	WHO	Laserson	Laserson	Not used
8	Brust [8]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
9	Chan (Denver) [9]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
10	Cegielski [10,11]	Laserson	Laserson	Laserson	Laserson	Laserson	Not assessed
11	Dheda [12-14]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
12	Fox [15]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
13	Gegia [16]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
14	Guglielmetti [17,18]	See footnote: A	Laserson	See footnote: B	Laserson	Laserson	Laserson
15	Guglielmetti [19]	WHO	WHO	WHO	WHO	WHO	WHO
16	Hughes [20]	Laserson	Laserson	Laserson	Laserson	Laserson	Not assessed
17	Isaakidis [20, 21]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
18	Janssen [22]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
19	Jarlsberg [23]]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
20	Kempker [24]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
21	Koenig [25]	2008-2013: Laserson; 2013-2015: ≥ 3	Laserson	Positive cultures after 6 months OR 2	Laserson	Laserson	Laserson

		consecutive negative results at the end of Rx		consecutive positive cultures after culture conversion.			
22	Kuksa [26]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
23	Kuksa [27]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
24	Koh [28,29]	See footnote: A	Laserson	See footnote: B	Laserson	Laserson	Laserson
25	Kvasnovsky [30,31]	See footnote: A	Laserson	See footnote: B	Laserson	Laserson	Laserson
26	Lange [32]	Laserson	Laserson	Laserson	Laserson	Laserson	
27	Laniado-Laborin [33]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
28	Leung [34,35]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
29	Marks [36]	Not reported	Laserson	If ≥ 2 positive cultures in final months of treatment; OR, treatment stopped due to AE	Laserson	Laserson	
30	Migliori [37,38]	See footnote: A	Laserson	See footnote: B	Laserson	Laserson	Laserson
31	Migliori (BDQ) [39]	WHO	WHO	WHO	WHO	WHO	
32	Milanov [40]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
33	Ndjeka [41]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
34	Ndjeka (SA cohort) [42]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
35	O'Donnell [43]	Laserson	Laserson	Laserson	Laserson	Laserson	
36	Palmero [44]	WHO	WHO	See footnote: B	WHO	Laserson	Laserson
37	Podewils [45]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
38	Riekstina/Leimane [46]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
39	Rodriguez [47]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
40	Seo [48]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
41	Seung [49]						
42	Shim [29,50]	WHO	WHO	WHO	WHO	WHO	WHO
43	Singla [51]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson

44	Skrahina [52]	WHO	WHO	WHO	WHO	WHO	WHO
45	Smith [53]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
46	Udwadia [54]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
47	Van der Werf [55]	Negative cultures, after initial positive culture	Laserson		Laserson	Laserson	No relapse in this study
48	Vasilyeva [56]	WHO	WHO	WHO	WHO	WHO	WHO
49	Viiklepp [57]	Laserson	Laserson	Laserson	Laserson	Laserson	Laserson
50	Yim [58]	See footnote: A	Laserson	See footnote: B	Laserson	Laserson	Laserson

Commonly used alternative outcome definitions:

A: For Cure: Treatment completed as planned, or as per national guidelines, AND at least 3 consecutive negative cultures (at least one month apart) after the end of intensive phase

B: For Failure: Treatment terminated or permanent change of >2 anti-TB drugs because of: lack of conversion by the end of the intensive phase; OR, bacteriological reversion after conversion; OR, acquired resistance to fluoroquinolones or second-line injectables; OR, AE.

Outcome definitions suggested by Laserson *et al.*:

For Cure: Treatment completed according to country protocol, AND at least five negative cultures for the final 12 months of treatment

For Treatment completed: Completed treatment according to country protocol but does not meet the definition for cure or treatment failure due to lack of bacteriologic results

For Treatment failure: Considered to have failed if two or more of the five cultures recorded in the final 12 months are positive, if any one of the final three culture is positive, or if a clinical decision has been made to terminate treatment early due to poor response or adverse events

For Death: Death for any reason during the course of MDR-TB treatment

For Treatment default: Treatment interruption for 2 or more consecutive months for any reason

For Transfer out: Transferred to an other reporting and recording unit with unknown treatment outcome

Reference

1. Ahmad N, Javaid A, Basit A, et al. Management and treatment outcomes of MDR-TB: results from a setting with high rates of drug resistance. *Int J Tuberc Lung Dis*. 2015. 19(9): p. 1109-14, i-ii.
2. Anger HA, Dworkin F, Sharma S, Munsiff SS, Nilsen DM, Ahuja SD. Linezolid use for treatment of multidrug-resistant and extensively drug-resistant tuberculosis, New York City, 2000-06. *J Antimicrob Chemother*. 2010. 65(4): p. 775-83.
3. Anderson LF, Tamne S, Watson JP, et al. Treatment outcome of multi-drug resistant tuberculosis in the United Kingdom: retrospective-prospective cohort study from 2004 to 2007. *Euro Surveill*. 2013. 18(40).
4. Bang D, Lillebaek T, Thomsen VO, Andersen AB. Multidrug-resistant tuberculosis: treatment outcome in Denmark, 1992- 2007. *Scand J Infect Dis*. 2010. 42(4): p. 288-93.
5. Barry PM, Flood J, Lowenthal P, Westenhouse J, California Department of Public Health. Unpublished data (California, USA). 2016.
6. Bonnet M, Pardini M, Meacci F, et al. Treatment of tuberculosis in a region with high drug resistance: outcomes, drug resistance amplification and re-infection. *PLoS One*. 2011. 6(8): p. e23081.
7. Brode S, West Park Healthcare Centre. Unpublished data (Toronto, Canada). 2016.
8. Brust JC, Gandhi NR, Carrara H, Osburn G, Padayatchi N. High treatment failure and default rates for patients with multi-drug resistant tuberculosis in KwaZulu-Natal, South Africa, 2000-2003. *Int J Tuberc Lung Dis*. 2010. 14(4): p. 413-9.
9. Chan ED, National Jewish Health. Unpublished data (Denver, USA). 2016.
10. Cegielski JP, Kurbatova E, van der Walt M, et al. Multidrug-Resistant Tuberculosis Treatment Outcomes in Relation to Treatment and Initial Versus Acquired Second-Line Drug Resistance. *Clin Infect Dis*. 2016. 62(4): p. 418-430.
11. Yuen CM, Kurbatova EV, Tupasi T, et al. Association between Regimen Composition and Treatment Response in Patients with Multidrug-Resistant Tuberculosis: A Prospective Cohort Study. *PLoS Med*. 2015. 12(12): p. e1001932.
12. Pietersen E, Ignatius E, Streicher EM, et al. Long-term outcomes of patients with extensively drug-resistant tuberculosis in South Africa: a cohort study. *Lancet*. 2014. 383(9924): p. 1230-9.
13. Shean K, Streicher E, Pieterse E, et al. Drug-associated adverse events and their relationship with outcomes in patients receiving treatment for extensively drug-resistant tuberculosis in South Africa. *PLoS One*. 2013. 8(5): p. e63057.
14. Dheda K, Shean K, Zumla A, et al. Early treatment outcomes and HIV status of patients with extensively drug-resistant tuberculosis in South Africa: a retrospective cohort study. *Lancet*. 2010. 375(9728): p. 1798-807.
15. Fox GJ, Chang V. Unpublished data (Sydney, Australia). 2018

16. Gegia M, Kalandadze I, Kempker RR, Magee MJ, Blumberg HM. Adjunctive surgery improves treatment outcomes among patients with multidrug-resistant and extensively drug-resistant tuberculosis. *Int J Infect Dis*. 2012. 16(5): p. e391-6.
17. Guglielmetti L, Jaspard M, Le Du D, et al. Long-term outcome and safety of prolonged bedaquiline treatment for multi-drug resistant tuberculosis. *Eur Respir J*. 2017. 49(3).
18. Guglielmetti L, Le Du D, Jachym M, et al. Compassionate use of bedaquiline for the treatment of multidrug-resistant and extensively drug-resistant tuberculosis: interim analysis of a French cohort. *Clin Infect Dis*. 2015. 60(2): p. 188-94.
19. Guglielmetti L, Barkane L, Le Du D, et al. Safety and efficacy of exposure to bedaquiline delamanid in multidrug-resistant tuberculosis: a case series from France and Latvia. *Eur Respir J*. 2018;51(3)
20. Hughes J, Isaakidis P, Andries A, et al. Linezolid for multidrug-resistant tuberculosis in HIV-infected and -uninfected patients. *Eur Respir J*. 2015. 46(1): p. 271-4.
21. Isaakidis P, Varghese B, Mansoor H, et al. Adverse events among HIV/MDR-TB co-infected patients receiving antiretroviral and second line anti-TB treatment in Mumbai, India. *PLoS One*. 2012. 7(7): p. e40781.
22. Pym AS, Diacon AH, Tang SJ, et al. Bedaquiline in the treatment of multidrug- and extensively drug-resistant tuberculosis. *Eur Respir J*. 2016; 47(2): p.564-74.
23. Jarlsberg L, Nahid P. Unpublished data (San Francisco, USA). 2016.
24. Kempker RR, Kipiani M, Mirtskhulava V, Tukvadze N, Magee MJ, Blumberg HM. Acquired Drug Resistance in Mycobacterium tuberculosis and Poor Outcomes among Patients with Multidrug-Resistant Tuberculosis. *Emerg Infect Dis*. 2015. 21(6): p. 992-1001.
25. Charles M, Vilbrun SC, Koenig SP, et al. Treatment outcomes for patients with multidrug-resistant tuberculosis in post earthquake Port-au-Prince, Haiti. *Am J Trop Med Hyg*. 2014. 91(4): p. 715-21.
26. Kuksa L, Barkane L, Hittel N, Gupta R. Final treatment outcomes of multidrug- and extensively drug-resistant tuberculosis patients in Latvia receiving delamanid-containing regimens. *Eur Respir J*. 2017;50(5).
27. Kuksa L. Unpublished data (Latvia). 2018.
28. Jeong BH, Jeon K, Park HY, et al. Outcomes of pulmonary MDR-TB: impacts of fluoroquinolone resistance and linezolid treatment. *J Antimicrob Chemother*. 2015. 70(11): p. 3127-33.
29. Koh WJ, Kang YR, Jeon K, et al. Daily 300 mg dose of linezolid for multidrug-resistant and extensively drug-resistant tuberculosis: updated analysis of 51 patients. *J Antimicrob Chemother*. 2012. 67(6): p. 1503-7.
30. Kvasnovsky CL, Cegielski JP, van der Walt ML. Treatment Outcomes for Patients with Extensively Drug-Resistant Tuberculosis, KwaZulu-Natal and Eastern Cape Provinces, South Africa. *Emerg Infect Dis*. 2016. 22(9).

31. Kvasnovsky CL, Cegielski JP, Erasmus R, Siwisa NO, Thomas K, der Walt ML. Extensively drug-resistant TB in Eastern Cape, South Africa: high mortality in HIV-negative and HIV-positive patients. *J Acquir Immune Defic Syndr*. 2011. 57(2): p. 146-52. 28
32. Eker B, Ortmann J, Migliori GB, et al. Multidrug- and extensively drug-resistant tuberculosis, Germany. *Emerg Infect Dis*. 2008. 14(11): p. 1700-6.
33. Laniado-Laborin R, Estrada-Guzman J, Perez H, Batiz-Armenta F, Alcantar-Schramm JM. Treatment of multidrug-resistant tuberculosis in a high-prevalence region through a binational consortium. *Int J Tuberc Lung Dis*. 2012. 16(5): p. 610-1.
34. Chang KC, Yew WW, Cheung SW, et al. Can intermittent dosing optimize prolonged linezolid treatment of difficult multi-drug resistant tuberculosis? *Antimicrob Agents Chemother*. 2013. 57(7): p. 3445-9.
35. Chang KC, Leung CC, Yew WW, et al. Pyrazinamide may improve fluoroquinolone-based treatment of multidrug-resistant tuberculosis. *Antimicrob Agents Chemother*. 2012. 56(11): p. 5465-75.
36. Marks SM, Flood J, Seaworth B, et al. Treatment practices, outcomes, and costs of multidrug-resistant and extensively drug resistant tuberculosis, United States, 2005-2007. *Emerg Infect Dis*. 2014. 20(5): p. 812-21.
37. Tiberi S, Payen MC, Sotgiu G, et al. Effectiveness and safety of meropenem/clavulanate-containing regimens in the treatment of MDR- and XDR-TB. *Eur Respir J*. 2016. 47(4): p. 1235-43.
38. Tiberi S, Sotgiu G, D'Ambrosio L, et al. Comparison of effectiveness and safety of imipenem/clavulanate- versus meropenem/clavulanate-containing regimens in the treatment of MDR- and XDR-TB. *Eur Respir J*. 2016. 47(6): p. 1758-66.
39. Borisov SE, Dheda K, Enwerem M, et al. Effectiveness and safety of bedaquiline-containing regimens in the treatment of MDR and XDR-TB: a multicentre study. *Eur Respir J*. 2017. 49(5).
40. Milanov V, Falzon D, Zamfirova M, et al. Factors associated with treatment success and death in cases with multi-drug resistant tuberculosis in Bulgaria, 2009-2010. *Int J Mycobacteriol*. 2015. 4(2): p. 131-7.
41. Ndjeka N, Conradie F, Schnippel K, et al. Treatment of drug-resistant tuberculosis with bedaquiline in a high HIV prevalence setting: an interim cohort analysis. *Int J Tuberc Lung Dis*. 2015. 19(8): p. 979-85.
42. Ndjeka N. Unpublished data (South Africa). 2018
43. O'Donnell MR, Padayatchi N, Kvasnovsky C, Werner L, Master I, Horsburgh CR, Jr. Treatment outcomes for extensively drug resistant tuberculosis and HIV co-infection. *Emerg Infect Dis*. 2013. 19(3): p. 416-24.
44. Palmero D, Gonzalez Montaner P, Cufre M, Garcia A, Vescovo M, Poggi S. First series of patients with XDR and pre-XDR TB treated with regimens that included meropenen-clavulanate in Argentina. *Arch Bronconeumol*. 2015. 51(10): p. e49-52.

45. Podewils LJ, Gler MT, Quelapio MI, Chen MP. Patterns of treatment interruption among patients with multidrug-resistant TB (MDR TB) and association with interim and final treatment outcomes. *PLoS One*. 2013. 8(7): p. e70064.
46. Riekstina V, Leimane V, Cirule A, Kuksa L, Latvia National TB registry. Unpublished data (Latvia). 2016.
47. Rodrigues D. Unpublished data (Brazil). 2018
48. Seo H. Unpublished data (South Korea). 2018
49. Seung KJ, Franke M, Linton SW. Multidrug-Resistant Tuberculosis Treatment in North Korea: Is Scale-Up Possible? *PLoS Med*. 2016. 13(8): p. e1002062.
50. Jo KW, Lee SD, Kim WS, Kim DS, Shim TS. Treatment outcomes and moxifloxacin susceptibility in ofloxacin-resistant multidrug-resistant tuberculosis. *Int J Tuberc Lung Dis*. 2014. 18(1): p. 39-43.
51. Singla R, Caminero JA, Jaiswal A, et al. Linezolid: an effective, safe and cheap drug for patients failing multidrug-resistant tuberculosis treatment in India. *Eur Respir J*. 2012. 39(4): p. 956-62.
52. Skrahina A. Unpublished data (Belarus). 2018.
53. Smith SE, Ershova J, Vlasova N, et al. Risk factors for acquisition of drug resistance during multidrug-resistant tuberculosis treatment, Arkhangelsk Oblast, Russia, 2005-2010. *Emerg Infect Dis*. 2015. 21(6): p. 1002-11. .
54. Udwardia ZF, Sen T, Moharil G. Assessment of linezolid efficacy and safety in MDR- and XDR-TB: an Indian perspective. *Eur Respir J*. 2010. 35(4): p. 936-8; author reply 938-40.
55. van Altena R, de Vries G, Haar CH, et al. Highly successful treatment outcome of multidrug-resistant tuberculosis in the Netherlands, 2000-2009. *Int J Tuberc Lung Dis*. 2015. 19(4): p. 406-12. 29
56. Vasilyeva I. Unpublished data (Russia). 2018.
57. Viikklepp P, Estonian TB Registry. Unpublished data (Estonia). 2016.
58. Kwak N, Kim HR, Yoo CG, Kim YW, Han SK, Yim JJ. Changes in treatment outcomes of multidrug-resistant tuberculosis. *Int J Tuberc Lung Dis*. 2015. 19(5): p. 525-30.

Supplementary Table S2. The list of countries included in the analysis with the number of patients from each country

Low/lower-middle-income countries (n)	Upper-middle-income countries (n)		High-middle-income countries (n)	
Haiti (162)	Argentina (10)	Russia (403)	Australia (26)	Latvia (359)
India (193)	Asia (83)	South Africa (2,769)	Belgium (17)	Netherland (138)
North Korea (353)	Belarus (105)	Thailand (53)	Canada (22)	Portugal (1)
Pakistan (180)	Brazil (97)		Denmark (7)	Slovakia (3)
Philippines (990)	Bulgaria (49)		Estonia (350)	South Korea (663)
	Ecuador (5)		France (54)	Sweden (3)
	Europe (52)		Germany (146)	Taiwan (50)
	Georgia (734)		Greece (17)	United Kingdom (136)
	Mexico (50)		Hong Kong (133)	United States (266)
	Peru (250)		Italy (107)	

Supplementary Table S3. Detailed baseline characteristics of 9,036 patients with MDR/RR-TB

	Period 1 (2001-2003)	Period 2 (2004-2006)	Period 3 (2007-2009)	Period 4 (2010-2012)	Period 5 (2013-2015)	p trend over time	Total (2001-2015)
Former or current smoker, n (%)							
Total	93 (50%)	574 (34%)	657 (34%)	107 (28%)	150 (56%)	0.068	
Low/ lower-middle	67 (61%)	222 (37%)	220 (28%)	53 (24%)	NA	0.03	562 (33%)
Upper-middle	NA	138 (27%)	298 (44%)	NA	108 (57%)	<0.001	544 (40%)
High	26 (34%)	214 (37%)	139 (29%)	54 (36%)	42 (53%)	0.28	475 (35%)
Antiretroviral therapy for HIV infection, n (%)							
Total	6 (2%)	104 (47%)	313 (66%)	107 (80%)	389 (64%)	<0.001	
Low/ lower-middle	NA	1 (100%)	29 (88%)	64 (88%)	37 (95%)	<0.001	131 (90%)
Upper-middle	0 (0%)	84 (44%)	273 (64%)	4 (31%)	330 (60%)	<0.001	691 (47%)
High	6 (100%)	19 (66%)	11 (65%)	39 (83%)	22 (85%)	<0.001	97 (78%)
Diabetes mellitus							
Total	50 (21%)	240 (14%)	266 (11%)	87 (9%)	36 (6%)	<0.001	
Low/ lower-middle	36 (23%)	141 (24%)	132 (16%)	37 (9%)	1 (1%)	<0.001	347 (17%)
Upper-middle	NA	27 (5%)	54 (6%)	7 (11%)	20 (6%)	0.008	108 (6%)
High	14 (17%)	72 (12%)	80 (13%)	43 (9%)	15 (8%)	0.022	224 (11%)

Abbreviations: MDR/RR-TB, multidrug-resistant or rifampin-resistant tuberculosis.

Supplementary Table S4. Initial AFB smear status and radiographic features of 9,036 patients with MDR-TB/RR-TB

	Period 1 (2001-2003)	Period 2 (2004-2006)	Period 3 (2007-2009)	Period 4 (2010-2012)	Period 5 (2013-2015)	P trend over time	Total (2001-2015)
AFB smear positivity, n (%)							
Total	120 (75%)	1,192 (79%)	1,618 (71%)	1,075 (78%)	768 (63%)	<0.001	4,773 (73%)
Low-/ lower-middle	22 (100%)	209 (95%)	441 (93%)	428 (90%)	99 (76%)	<0.001	1,199 (91%)
Upper-middle	NA	468 (86%)	755 (68%)	253 (81%)	501 (62%)	<0.001	1,977 (71%)
High	98 (71%)	515 (68%)	422 (60%)	394 (66%)	168 (61%)	0.08	1,597 (65%)
Presence of cavity, n (%)							
Total	139 (52%)	1,069 (60%)	1,210 (61%)	850 (57%)	397 (70%)	<0.001	3,665 (60%)
Low-/ lower-middle	88 (53%)	329 (57%)	216 (49%)	355 (56%)	8 (89%)	<0.001	996 (55%)
Upper-middle	NA	343 (65%)	616 (68%)	167 (65%)	221 (78%)	<0.001	1,347 (68%)
High	51 (50%)	397 (60%)	378 (60%)	328 (55%)	168 (61%)	<0.001	1,322 (58%)
Bilateral disease, n (%)							
Total	161 (67%)	1,196 (75%)	1,409 (69%)	564 (69%)	273 (59%)	<0.001	3,603 (70%)
Low-/ lower-middle	126 (76%)	455 (78%)	518 (67%)	278 (81%)	7 (78%)	<0.001	1,384 (74%)
Upper-middle	NA	419 (81%)	577 (79%)	19 (70%)	104 (57%)	0.81	1,119 (77%)
High	35 (46%)	322 (65%)	314 (58%)	267 (59%)	162 (61%)	<0.001	1,100 (60%)

Abbreviations: AFB, acid-fast bacilli; MDR/RR-TB, multidrug-resistant or rifampin-resistant tuberculosis.

Supplementary Table S5. Detailed drug-susceptibility patterns of 9,036 patients with MDR/RR-TB

Resistance to each drugs, n (%)	Period 1 (2001-2003)	Period 2 (2004-2006)	Period 3 (2007-2009)	Period 4 (2010-2012)	Period 5 (2013-2015)	p trend over time	Total (2001-2015)
Isoniazid							
Total	1,374 (100%)	1,937 (99%)	2,728 (100%)	1,675 (100%)	1,151 (94%)	<0.001	
Low/ lower-middle	178 (100%)	610 (99%)	854 (100%)	755 (100%)	130 (100%)	<0.001	2,527 (100%)
Upper-middle	1,057 (100%)	556 (100%)	1168 (100%)	322 (100%)	742 (91%)	<0.001	3845 (98%)
High	139 (100%)	771 (99%)	706 (100%)	598 (100%)	279 (100%)	0.035	2,493 (100%)
Ethambutol							
Total	804 (59%)	1,233 (64%)	1,562 (67%)	1,162 (73%)	523 (74%)	<0.001	
Low/ lower-middle	144 (81%)	485 (79%)	642 (76%)	528 (70%)	102 (81%)	<0.001	1,901 (75%)
Upper-middle	605 (57%)	268 (50%)	477 (61%)	180 (71%)	206 (68%)	<0.001	1,736 (59%)
High	55 (40%)	480 (62%)	443 (63%)	454 (77%)	215 (78%)	<0.001	1,647 (66%)
Pyrazinamide							
Total	107 (38%)	646 (45%)	646 (49%)	880 (61%)	418 (65%)	<0.001	
Low/ lower-middle	67 (48%)	226 (41%)	255 (49%)	338 (54%)	87 (77%)	0.07	973 (50%)
Upper-middle	NA	71 (58%)	61 (51%)	175 (75%)	146 (54%)	<0.001	453 (61%)
High	40 (29%)	349 (46%)	330 (49%)	367 (64%)	185 (71%)	<0.001	1,271 (53%)
Streptomycin							
Total	695 (51%)	1,249 (66%)	1,650 (74%)	1,190 (76%)	463 (52%)	<0.001	

Low/ lower-middle	108 (61%)	378 (61%)	683 (82%)	554 (74%)	84 (73%)	0.06	1,807 (73%)
Upper-middle	481 (46%)	351 (70%)	566 (81%)	178 (72%)	190 (34%)	<0.001	1,766 (58%)
High	106 (77%)	520 (68%)	401 (58%)	458 (80%)	189 (88%)	0.169	1,674 (70%)
Rifabutin							
Total	61 (73%)	637 (71%)	688 (69%)	171 (67%)	69 (83%)	<0.001	
Low/ lower-middle	NA	86 (67%)	213 (80%)	NA	NA	<0.001	299 (76%)
Upper-middle	NA	191 (64%)	189 (52%)	1 (3%)	2 (20%)	<0.001	383 (54%)
High	61 (73%)	360 (77%)	286 (77%)	170 (78%)	67 (92%)	<0.001	944 (78%)
Ethionamide							
Total	301 (25%)	284 (23%)	544 (32%)	384 (37%)	330 (55%)	<0.001	
Low/ lower-middle	8 (32%)	66 (31%)	372 (46%)	168 (36%)	58 (46%)	<0.001	672 (41%)
Upper-middle	271 (26%)	87 (22%)	111 (18%)	44 (18%)	131 (56%)	<0.001	644 (25%)
High	22 (22%)	131 (22%)	61 (20%)	172 (51%)	141 (59%)	<0.001	527 (33%)
Prothionamide							
Total	4 (10%)	26 (13%)	109 (30%)	80 (16%)	111 (51%)	<0.001	
Low/ lower-middle	NA	NA	NA	19 (7%)	NA	<0.001	19 (7%)
Upper-middle	NA	NA	1 (100%)	NA	57 (58%)	<0.001	58 (58%)
High	4 (10%)	26 (13%)	108 (29%)	61 (27%)	54 (45%)	<0.001	253 (27%)
PAS							
Total	13 (17%)	186 (16%)	281 (16%)	216 (18%)	128 (24%)	<0.001	

Low/ lower-middle	1 (4%)	20 (9%)	83 (10%)	55 (10%)	18 (14%)	<0.001	177 (10%)
Upper-middle	NA	48 (12%)	78 (16%)	42 (19%)	53 (29%)	<0.001	221 (17%)
High	12 (24%)	118 (20%)	120 (26%)	119 (29%)	57 (25%)	<0.001	426 (24%)

Abbreviations: MDR/RR-TB, multidrug-resistant or rifampin-resistant tuberculosis.

Supplementary Table S6. The pattern of drug usage other than Group A and B in 9,036 patterns with MDR/RR-TB

	Period 1 (2001-2003)	Period 2 (2004-2006)	Period 3 (2007-2009)	Period 4 (2010-2012)	Period 5 (2013-2015)	p trend over time	Total (2001-2015)
Ciprofloxacin							
Total	23 (2%)	270 (14%)	133 (5%)	11 (1%)	0 (0%)	<0.001	
Low/ lower-middle	7 (4%)	21 (3%)	2 (0%)	0 (0%)	0 (0%)	<0.001	30 (1%)
Upper-middle	0 (0%)	204 (37%)	126 (11%)	11 (3%)	0 (0%)	<0.001	341 (9%)
High	16 (12%)	45 (6%)	5 (1%)	0 (0%)	0 (0%)	<0.001	66 (3%)
Ofloxacin							
Total	1,159 (84%)	912 (47%)	859 (31%)	241 (14%)	13 (1%)	<0.001	
Low/ lower-middle	101 (57%)	340 (55%)	228 (27%)	0 (0%)	1 (1%)	<0.001	670 (26%)
Upper-middle	1,057 (100%)	354 (64%)	479 (41%)	124 (39%)	11 (1%)	<0.001	2,025 (52%)
High	1 (1%)	218 (28%)	152 (22%)	117 (20%)	1 (0%)	<0.001	489 (20%)
Amikacin							
Total	27 (2%)	439 (23%)	264 (10%)	420 (24%)	244 (20%)	<0.001	
Low/ lower-middle	2 (1%)	0 (0%)	2 (0%)	166 (20%)	2 (2%)	<0.001	172 (7%)
Upper-middle	0 (0%)	308 (55%)	142 (12%)	70 (22%)	138 (17%)	<0.001	658 (17%)
High	25 (18%)	131 (17%)	120 (17%)	184 (31%)	104 (37%)	<0.001	564 (23%)
Kanamycin							
Total	1,214 (88%)	856 (44%)	874 (32%)	825 (47%)	395 (32%)	<0.001	

Low/ lower-middle	112 (63%)	490 (80%)	294 (34%)	526 (63%)	67 (51%)	<0.001	1,489 (57%)
Upper-middle	1,057 (100%)	193 (35%)	349 (30%)	128 (40%)	291 (35%)	<0.001	2,018 (51%)
High	45 (32%)	173 (22%)	231 (33%)	171 (29%)	37 (13%)	0.065	657 (26%)
Capreomycin							
Total	74 (5%)	520 (27%)	1,484 (54%)	481 (27%)	345 (28%)	<0.001	
Low/ lower-middle	34 (19%)	118 (19%)	540 (63%)	156 (19%)	58 (44%)	0.072	906 (35%)
Upper-middle	0 (0%)	114 (21%)	791 (68%)	114 (35%)	152 (19%)	<0.001	1,171 (30%)
High	40 (29%)	288 (37%)	153 (22%)	211 (35%)	135 (48%)	0.002	827 (33%)
Streptomycin							
Total	51 (4%)	395 (20%)	443 (16%)	54 (3%)	58 (5%)	<0.001	
Low/ lower-middle	32 (18%)	69 (11%)	115 (13%)	1 (0%)	0 (0%)	<0.001	217 (8%)
Upper-middle	0 (0%)	175 (31%)	165 (14%)	5 (2%)	58 (7%)	0.498	403 (10%)
High	19 (14%)	151 (19%)	163 (23%)	48 (8%)	0 (0%)	<0.001	381 (15%)
Ethionamide or prothionamide, n (%)							
Total	1,263 (92%)	1,583 (81%)	2,426 (89%)	1,461 (83%)	721 (59%)	<0.001	
Low/ lower-middle	109 (61%)	506 (82%)	840 (98%)	799 (96%)	89 (68%)	<0.001	2,343 (90%)
Upper-middle	1,057 (100%)	517 (93%)	1,043 (89%)	255 (79%)	439 (54%)	<0.001	3,311 (84%)
High	97 (70%)	560 (72%)	543 (77%)	407 (68%)	193 (69%)	0.163	1,800 (72%)
Meropenem or imipenem, n (%)							
Total	3 (0%)	5 (0%)	28 (1%)	94 (5%)	117 (10%)	<0.001	

Low/ lower-middle	0	0	1 (0%)	1 (0%)	2 (2%)	0.017	4 (0%)
Upper-middle	0	0	1 (0%)	21 (7%)	83 (10%)	<0.001	105 (3%)
High	3	5 (1%)	26 (4%)	72 (12%)	32 (11%)	<0.001	138 (6%)
PAS, n (%)							
Total	149 (11%)	958 (49%)	1,925 (70%)	1,221 (70%)	515 (42%)	<0.001	
Low/ lower-middle	115 (65%)	374 (61%)	675 (79%)	695 (84%)	65 (50%)	<0.001	1,924 (74%)
Upper-middle	0 (0%)	215 (39%)	878 (75%)	188 (58%)	303 (37%)	<0.001	1,584 (40%)
High	34 (24%)	369 (48%)	372 (53%)	338 (57%)	147 (53%)	<0.001	1,260 (50%)
Ethambutol, n (%)							
Total	573 (42%)	947 (49%)	1,329 (49%)	413 (24%)	525 (43%)	<0.001	
Low/ lower-middle	29 (16%)	101 (16%)	152 (18%)	77 (9%)	10 (8%)	<0.001	369 (14%)
Upper-middle	452 (43%)	456 (82%)	907 (77%)	178 (55%)	401 (49%)	0.24	2,394 (61%)
High	92 (66%)	390 (50%)	270 (38%)	158 (26%)	114 (41%)	<0.001	1,024 (41%)
Pyrazinamide, n (%)							
Total	1,250 (91%)	1,428 (73%)	2,186 (80%)	1,271 (73%)	965 (78%)	<0.001	
Low/ lower-middle	109 (61%)	405 (66%)	688 (80%)	765 (92%)	79 (60%)	<0.001	2,046 (78%)
Upper-middle	1,057 (100%)	543 (98%)	1111 (95%)	216 (67%)	713 (87%)	<0.001	3,640 (93%)
High	84 (60%)	480 (62%)	387 (55%)	290 (48%)	173 (62%)	0.011	1,414 (57%)
High-dose isoniazid, n (%)							
Total	11 (1%)	32 (2%)	146 (5%)	90 (5%)	149 (12%)	<0.001	

Low/ lower-middle	0 (0%)	8 (1%)	10 (1%)	37 (4%)	49 (37%)	<0.001	104 (4%)
Upper-middle	0 (0%)	18 (3%)	132 (11%)	29 (9%)	99 (12%)	<0.001	278 (7%)
High	11 (8%)	6 (1%)	4 (1%)	24 (4%)	1 (0%)	0.6	46 (2%)
Delamanid, n (%)							
Total	0 (0%)	0 (0%)	1 (0%)	16 (1%)	42 (3%)	<0.001	59 (1%)
Low-/ lower-middle	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (1%)	0.054	1 (0%)
Upper-middle	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0%)	0.13	1 (0%)
High	0 (0%)	0 (0%)	1 (0%)	16 (3%)	40 (14%)	<0.001	57 (2%)

Abbreviations: MDR/RR-TB, multidrug-resistant or rifampin-resistant tuberculosis.

Supplementary Table S7. Odds ratios for death by income category (relative to upper-middle-income countries) over time, using imputed data

	Period 1	Period 2	Period 3	Period 4	Period 5
	(2001-2003)	(2004-2006)	(2007-2009)	(2010-2012)	(2013-2015)
Model 1 -Unadjusted					
Low/lower-middle	0·6 (0·37, 0·96)	0·45 (0·28, 0·73)	0·27 (0·17, 0·42)	1·86 (0·79, 4·38)	1·1 (0·37, 3·28)
High	0·5 (0·28, 0·88)	0·27 (0·17, 0·42)	0·08 (0·04, 0·17)	0·49 (0·2, 1·17)	0·33 (0·14, 0·79)
Model 2					
Low/lower-middle	0·97 (0·57, 1·66)	0·75 (0·5, 1·1)	0·26 (0·16, 0·41)	1·53 (0·73, 3·22)	1·3 (0·51, 3·26)
High	0·68 (0·37, 1·26)	0·43 (0·29, 0·63)	0·09 (0·04, 0·18)	0·43 (0·19, 0·95)	0·38 (0·17, 0·85)
Model 3					
Low/lower-middle	1·09 (0·61, 1·94)	0·69 (0·39, 1·22)	0·23 (0·15, 0·37)	1·86 (0·8, 4·29)	1·32 (0·47, 3·74)
High	0·53 (0·28, 0·99)	0·36 (0·21, 0·6)	0·1 (0·05, 0·21)	0·5 (0·21, 1·2)	0·41 (0·17, 0·95)
Model 4					
Low/lower-middle	0·97 (0·53, 1·79)	0·72 (0·46, 1·12)	0·33 (0·2, 0·54)	1·86 (0·81, 4·25)	1·19 (0·44, 3·21)
High	0·51 (0·26, 1)	0·37 (0·24, 0·59)	0·14 (0·07, 0·27)	0·49 (0·21, 1·17)	0·42 (0·18, 0·96)
Model 5					
Low/lower-middle	0·97 (0·53, 1·79)	0·84 (0·54, 1·31)	0·44 (0·27, 0·75)	1·5 (0·57, 3·94)	1·4 (0·43, 4·61)
High	0·5 (0·23, 1·07)	0·36 (0·22, 0·57)	0·16 (0·08, 0·32)	0·45 (0·18, 1·11)	0·43 (0·18, 0·99)

Model 2= Adjusting age, sex, BMI, smoking, HIV infection, and diabetes mellitus

Model 3= Model 2+ Adjusting previous TB treatment, AFB smear, and radiographic severity

Model 4= Model 3+ Adjusting susceptibility to frequently used drugs, SLIs and FQs

Model 5= Model 4+ Adjusting the number of used Group A drugs (adjusting 2 or more group A drugs used versus less than 2 group A drugs used)

Abbreviations: BMI, body mass index; TB, tuberculosis; AFB, acid-fast bacilli; SLI, second-line injectable drugs; FQ, fluoroquinolone.