

Using Bayesian spatial models to map and to identify geographical hotspots of multidrug-resistant tuberculosis in Portugal between 2000 and 2016

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Supplementary Table S1. The absolute annual number of multidrug-resistant tuberculosis (MDR-TB) and non-MDR-TB cases, in Continental Portugal, from 2000 to 2016.

Year	MDR-TB	Non-MDR-TB	Total
2000	50	4417	4467
2001	43	4315	4358
2002	47	4528	4575
2003	43	4159	4202
2004	56	3804	3860
2005	45	3536	3581
2006	31	3390	3421
2007	47	3078	3125
2008	30	2851	2881
2009	26	2743	2769
2010	28	2622	2650
2011	33	2499	2532
2012	23	2510	2533
2013	16	2312	2328
2014	25	2160	2185
2015	22	2076	2098
2016	18	1834	1852
Total	583	52834	53417

Supplementary Table S2. Comparison of the patient's characteristics between groups: MDR-TB (583 cases) with non-MDR-TB random sample I (583 cases) and MDR-TB (583 cases) with non-MDR-TB random sample II (583 cases).

Patient's characteristics		MDR-TB n (IQR or %)	Non-MDR-TB random sample I n (IQR or %)	<i>p-value</i>	Non-MDR-TB random sample II n (IQR or %)	<i>p-value</i>
Age (years)	Median (IQR)	40.0 (19)	43.0 (26)	0.015	43.0 (26)	0.004
Gender	Female	174 (29.8)	199 (34.1)	0.132	198 (34.0)	0.148
	Male	409 (70.2)	384 (65.9)		385 (66.0)	
Country of origin	Foreign-born	159 (27.3)	85 (14.6)	<0.001	79 (13.6)	<0.001
	Native	424 (72.7)	498 (85.4)		504 (86.4)	
HIV status	Negative	421 (72.2)	522 (89.5)	<0.001	514 (88.2)	<0.001
	Positive	162 (27.8)	61 (10.5)		69 (11.8)	
Alcohol abuse	No	386 (75.5)	436 (82.1)	0.012	457 (86.1)	<0.001
	Yes	125 (24.5)	95 (17.9)		74 (13.9)	
Injectable drug use	No	415 (79.7)	481 (89.6)	<0.001	492 (91.1)	<0.001
	Yes	106 (20.3)	56 (10.4)		48 (8.9)	
Reclusion	No	481 (93.8)	523 (98.1)	0.001	529 (98.1)	0.001
	Yes	32 (6.2)	10 (1.9)		10 (1.9)	
Community residence	No	480 (94.6)	514 (96.6)	0.212	523 (96.7)	0.192
	Yes	26 (5.1)	18 (3.4)		18 (3.3)	
Homelessness	No	490 (96.3)	524 (98.3)	0.065	532 (98.0)	0.140
	Yes	19 (3.7)	9 (1.7)		11 (2.0)	
Diabetes	No	557 (95.5)	556 (95.4)	1.000	551 (94.5)	0.501
	Yes	26 (4.5)	27 (4.6)		32 (5.5)	
Silicose	No	578 (99.1)	578 (99.1)	1.000	578 (99.1)	1.000
	Yes	5 (0.9)	5 (0.9)		5 (0.9)	
Previous TB treatment	No	348 (59.7)	515 (88.3)	<0.001	529 (90.7)	<0.001
	Yes	235 (40.3)	68 (11.7)		54 (9.3)	
Site of disease	Pulmonary	530 (91.1)	422 (72.5)	<0.001	415 (71.3)	<0.001
	Extra-pulmonary	52 (8.9)	160 (27.5)		167 (28.7)	

TB=tuberculosis; MDR-TB= multidrug- resistant tuberculosis; n= number of cases; IQR= interquartile range; HIV =human immunodeficiency virus.

Supplementary Table S3. High-risk areas (standardized notification ratio is significantly above 1, i.e., above the country's average) for non-MDR-TB and MDR-TB, Continental Portugal, 2000-2016.

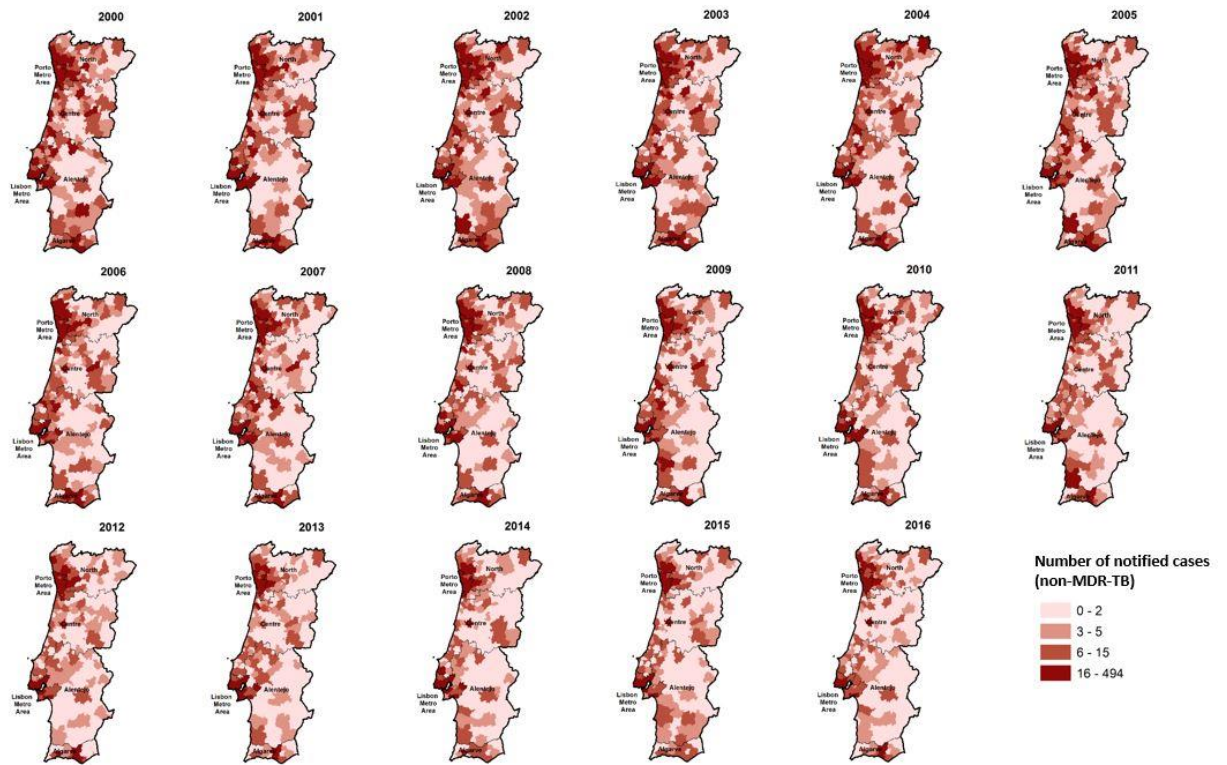
Region	Municipality	Non-MDR-TB (snr)	MDR-TB (snr)
NORTH	Vila Nova de Cerveira	1.21	nd
	Viana do Castelo	1.10	nd
	Esposende	1.32	nd
	Póvoa de Varzim ^a	1.67	nd
	Vila do Conde ^a	1.84	nd
	Gondomar ^a	1.57	nd
	Vila Nova de Gaia ^a	1.20	nd
	Maia ^a	1.27	nd
	Matosinhos ^a	1.64	nd
	Paredes ^a	1.25	nd
	Penafiel	2.66	nd
	Porto ^{a,b}	2.24	1.71
	Valongo ^a	1.61	nd
	Marco de Canaveses	1.98	nd
	Espinho ^a	1.24	nd
	Castelo de Paiva	1.14	nd
	Cinfães	1.39	nd
Resende	1.69	nd	
LISBON Metropolitan Area	Cascais	1.20	nd
	Lisboa ^b	1.81	3.49
	Loures ^b	1.25	2.12
	Oeiras ^b	1.32	1.90
	Sintra ^b	1.18	2.50
	Amadora ^b	1.89	2.99
	Odivelas ^b	1.24	2.97
	Almada ^b	1.42	1.79
	Alcochete	1.26	nd
	Moita	1.28	nd
Setúbal	1.25	nd	
ALENTEJO	Sines	1.23	nd
	Aljustrel	1.38	nd
	Almodôvar	1.36	nd
	Odemira	1.08	nd
ALGARVE	Faro	1.18	nd
	Loulé	1.37	nd
	Olhão	1.06	nd

TB=tuberculosis; MDR-TB= multidrug- resistant tuberculosis

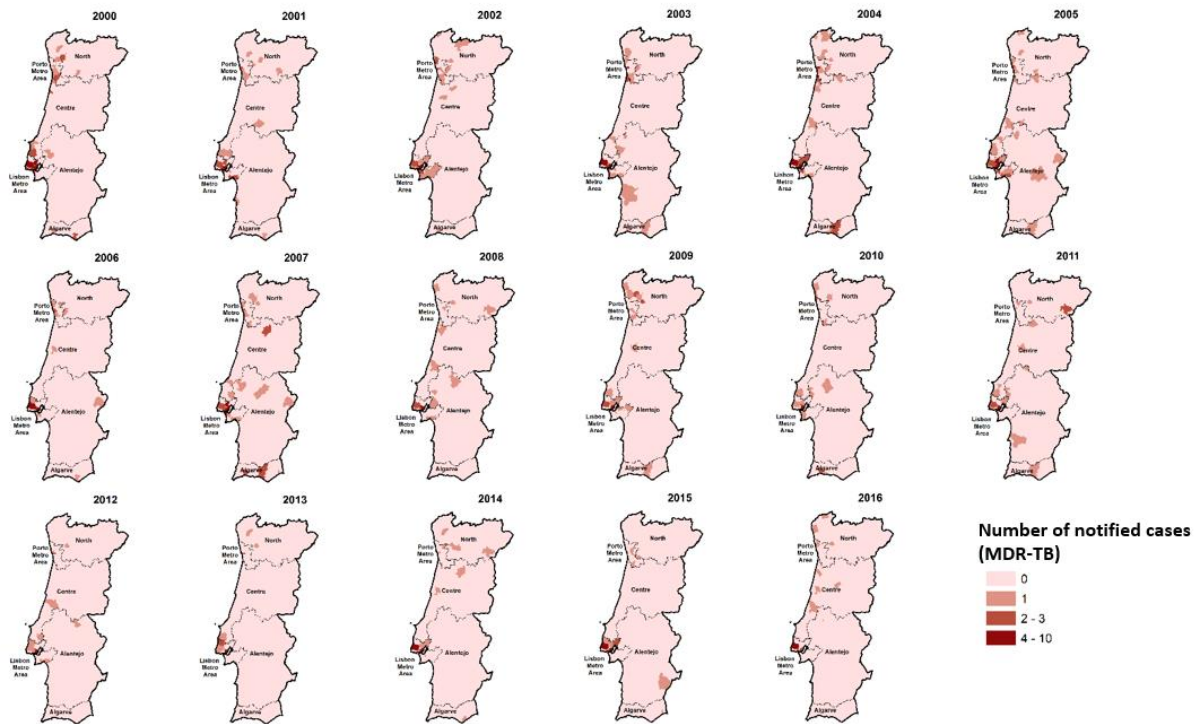
snr: standardized notification ratio; nd: not significantly different from country's average.

^a Porto Metropolitan Area.

^b High-risk areas for both MDR- and non-MDR-TB.



Supplementary Figure S1. Maps depicting a time series of the number of non-MDR-TB cases by municipality year by year, Continental Portugal, 2000-2016. TB=tuberculosis; MDR-TB= multidrug-resistant tuberculosis; the colour code displays the number of notified cases, from 0 to 494 cases.



Supplementary Figure S2. Maps depicting a time series of the number of MDR-TB cases by municipality year by year, Continental Portugal, 2000-2016. TB=tuberculosis; MDR-TB= multidrug- resistant tuberculosis; the colour code displays the number of notified cases, from 0 to 10 cases.