

II Seminário Internacional de Tuberculose em Ungulados Selvagens

Idanha-a-Nova – 23 de Setembro de 2011

Tuberculose Humana

Panorama Actual

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TUBERCULOSE HUMANA

- Doença infecciosa causada por um grupo de bactérias estritamente relacionadas que constituem o complexo *M. tuberculosis*:

M. tuberculosis

M. africanum

M. canetti

M. bovis

M. caprae

M. microti

M. pinnipedii

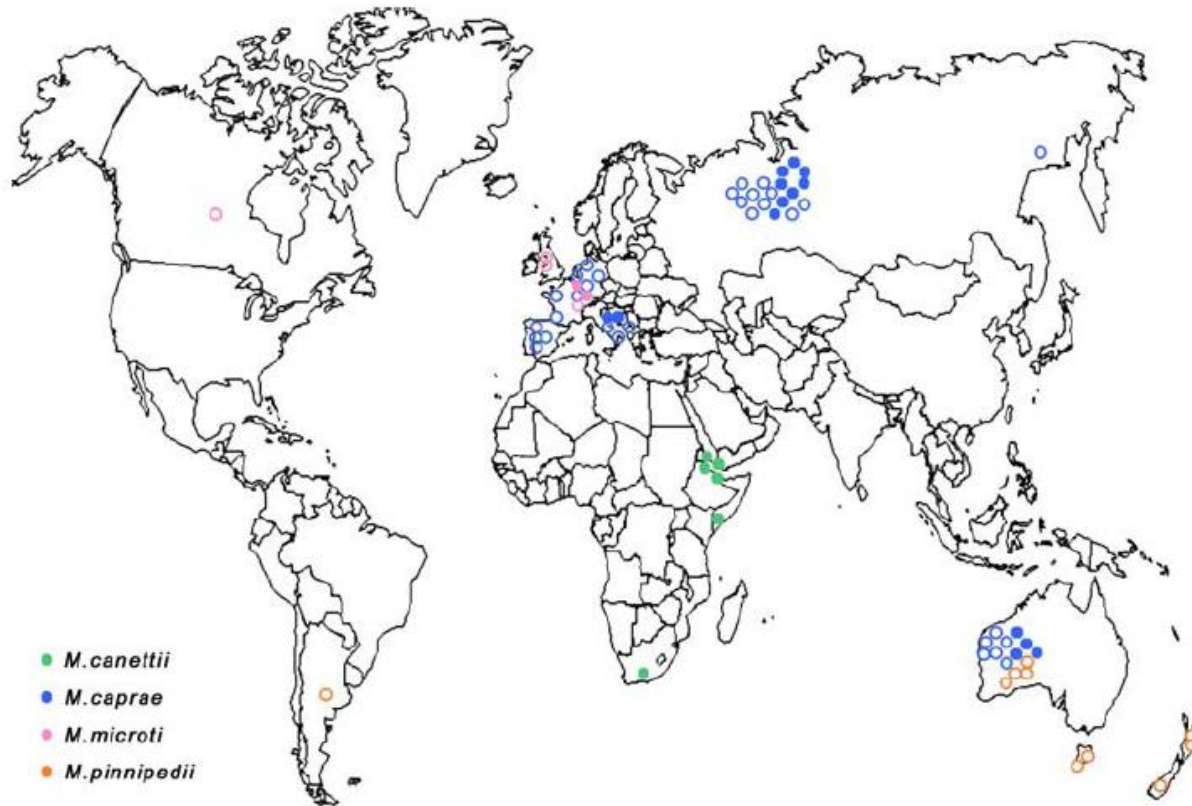


Figure 1. Distribution of rare *Mycobacterium tuberculosis* complex species in humans (filled circles) and animals (open circles). Green circles, *M. canettii*; blue circles, *M. caprae*; pink circles, *M. microti*; orange circles, *M. pinnipedii*. doi:10.1371/journal.pntd.0000253.g001

Djelouadji Z, Raoult D, Daffe M, Drancourt M (2008) A Single-Step Sequencing Method for the Identification of *Mycobacterium tuberculosis* Complex Species. *PLoS Negl Trop Dis* 2(6): e253. doi:10.1371/journal.pntd.0000253

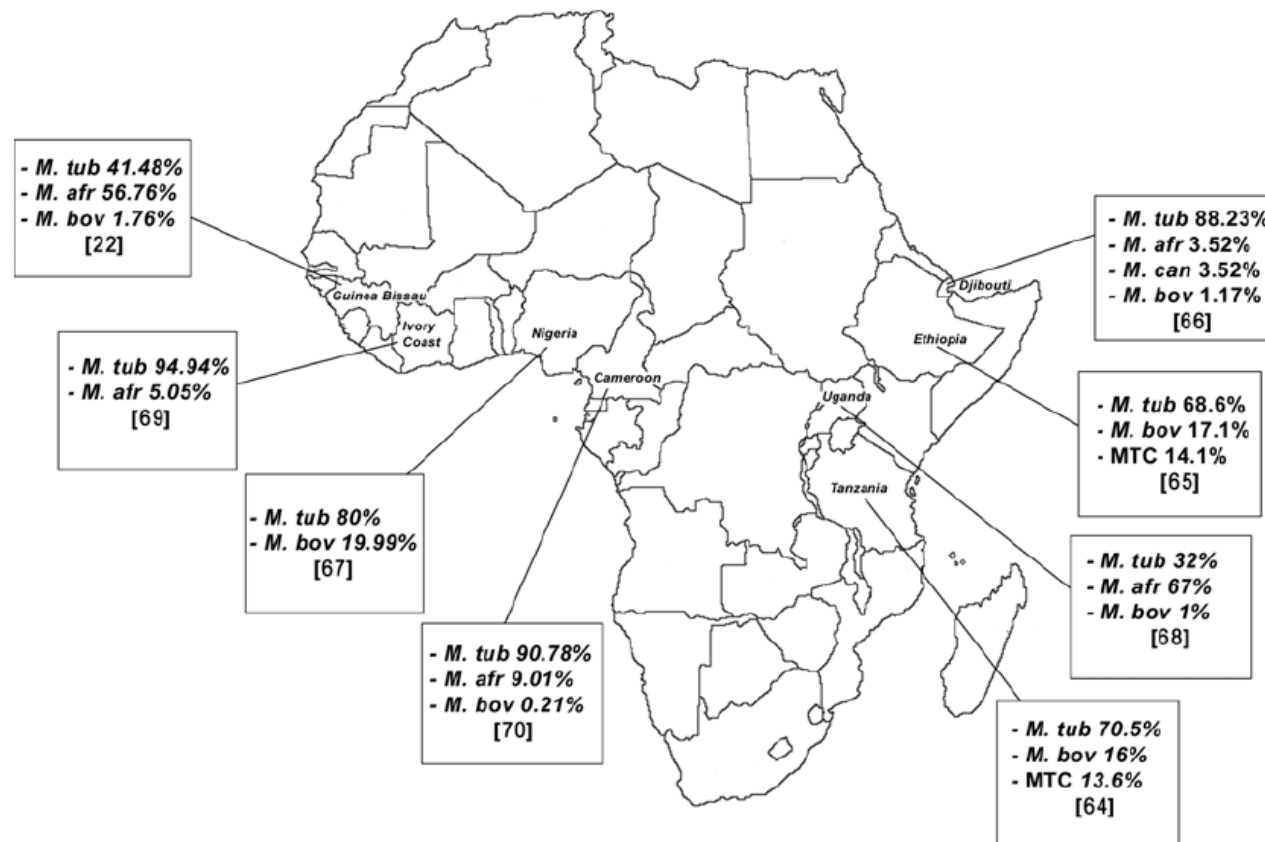


Figure 2. Distribution of *Mycobacterium tuberculosis* complex species in human tuberculosis cases in Africa. Based on a review of papers published in 1999–2007 [22,64–70]. For each country, prevalence rates and reference are indicated in cartoons. Mtub, *M. tuberculosis*; M afr, *M. africanum*; Mbov, *M. bovis*; Mcan, *M. canettii*; MTC, *Mycobacterium tuberculosis* complex. doi:10.1371/journal.pntd.0000253.g002

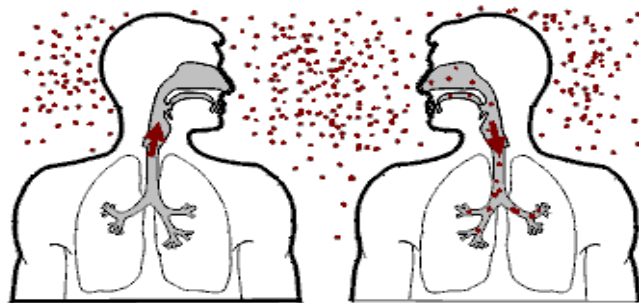
Djelouadji Z, Raoult D, Daffe M, Drancourt M (2008) A Single-Step Sequencing Method for the Identification of *Mycobacterium tuberculosis* Complex Species. PLoS Negl Trop Dis 2(6): e253. doi:10.1371/journal.pntd.0000253

TUBERCULOSE HUMANA (*M. tuberculosis*)

- Reservatório natural do *M. tuberculosis* : Homem
- Portas de entrada:
 - vias respiratórias (90%)
 - via cutânea
- Pode afectar qualquer órgão ou sistema do corpo humano:
 - forma pulmonar é a mais frequente (75%)
- Distribuição por idades:
 - idade mediana 35-44 anos

TUBERCULOSE HUMANA (*M. tuberculosis*)

- **Contágio:**
Inter-humano



inalação de partículas de 1 a 5 μm contendo *M. tuberculosis*

- **Risco de transmissão**

- positividade do caso índice
- tempo de contacto

• Tuberculose é uma doença com baixo **risco de doença** nos indivíduos expostos (cerca de 90% dos infectados nunca chega a adoecer)

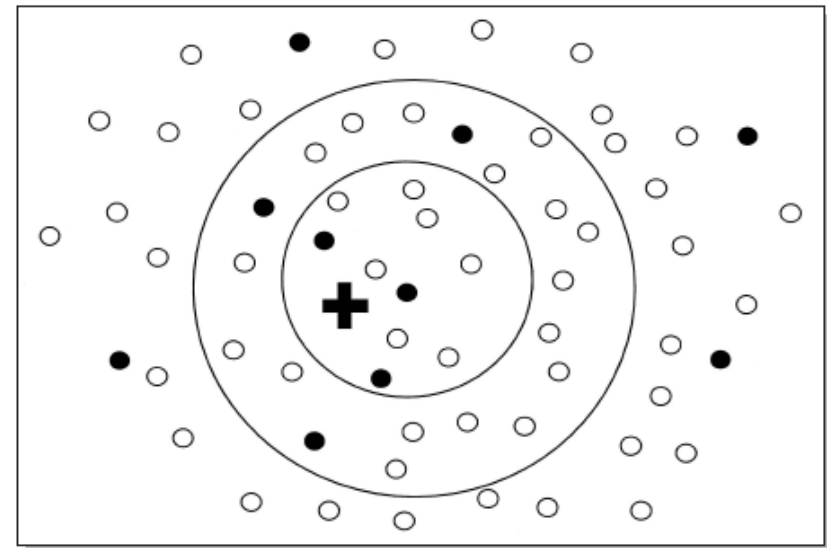
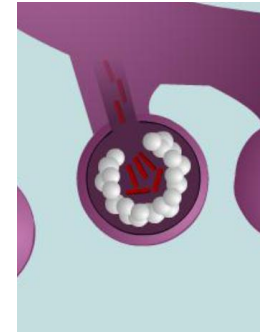
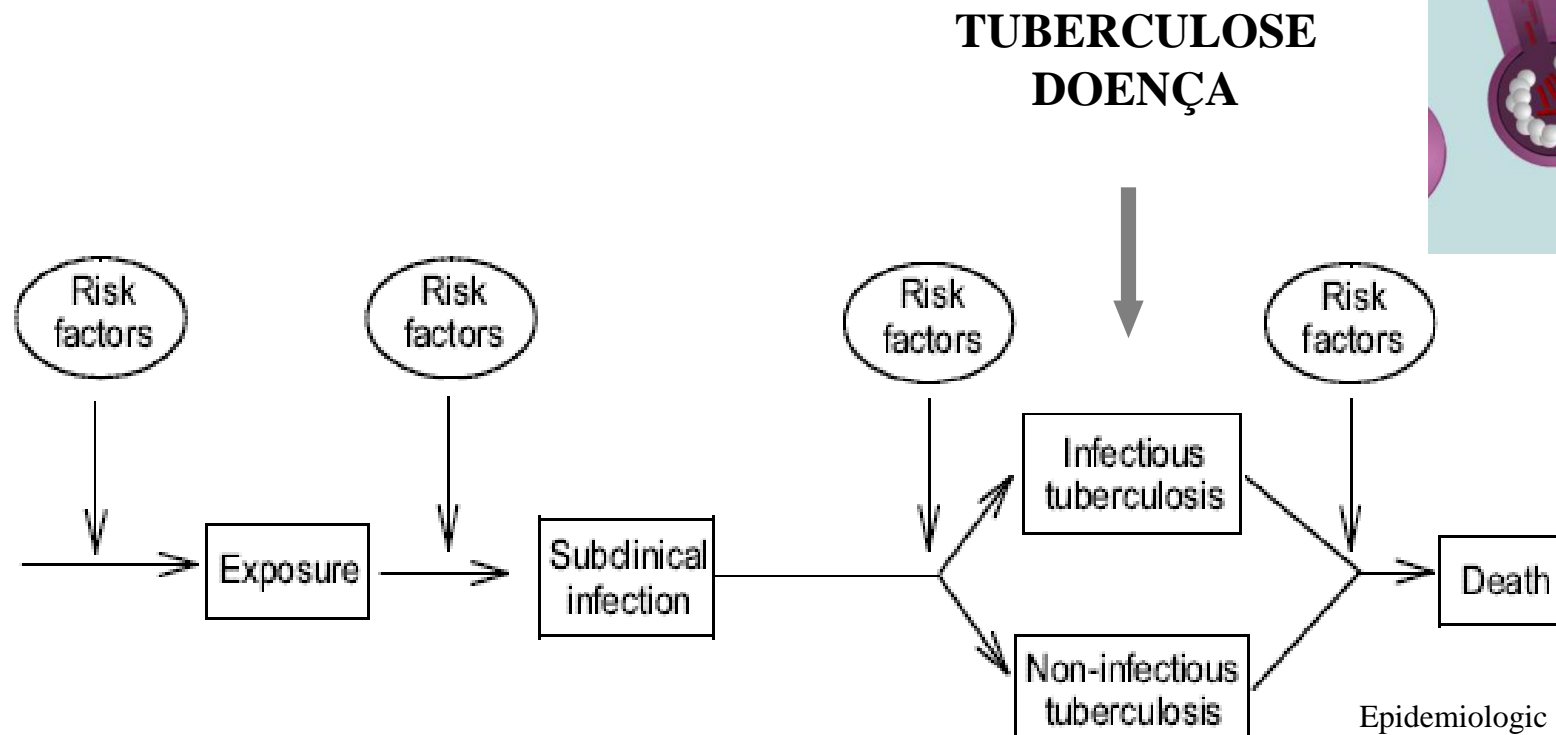
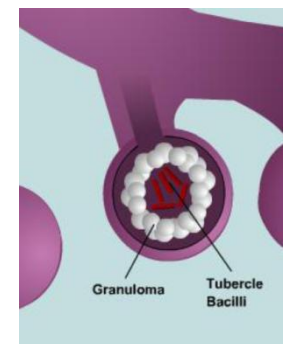


Figure 9. Example for the risk of infection among close contacts (inner circle), intermediate contacts (outer circle), and casual contacts. The index case is indicated by a cross, infected contacts by filled circles, and uninfected contacts by hollow circles.



Epidemiologic basis of tuberculosis control IUAATLD,1999



• **Risco de evolução** de tuberculose **latente** para tuberculose **doença** é cerca de 10% ,sendo maior nos 2 anos após infecção

TUBERCULOSE LATENTE

TUBERCULOSE HUMANA (*M. bovis*)

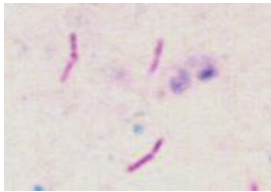
- Reservatório natural do *M. bovis* : animais (domésticos e selvagens)
- Portas de entrada:
 - vias respiratórias
 - via cutânea
 - via digestiva
- Pode afectar qualquer órgão ou sistema do corpo humano:
 - forma pulmonar – inalação de aerossóis
 - forma extrapulmonar (linfadenites cervicais) – ingestão

TUBERCULOSE HUMANA (*M. bovis*)

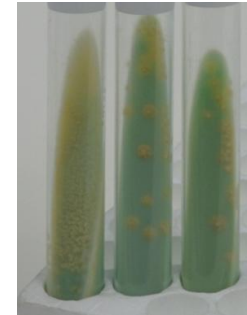
- Clinicamente: indistinguível da TB causada pelo *M. tuberculosis*
- Contágio:
 - animal - Homem
 - Homem - animal
 - muito raramente Homem - Homem
- Distribuição por idades:
 - maioria doentes ≥ 65 anos (reactivação)

DIAGNÓSTICO LABORATORIAL (tuberculose doença)

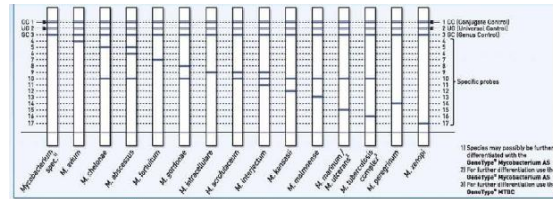
Exame directo



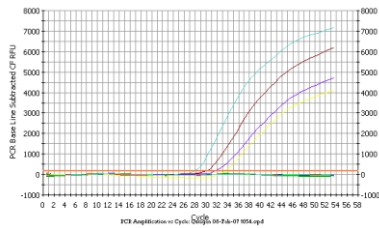
Exame cultural



Identificação



TAAN



Teste sensibilidade aos fármacos

Detecção molecular de resistências

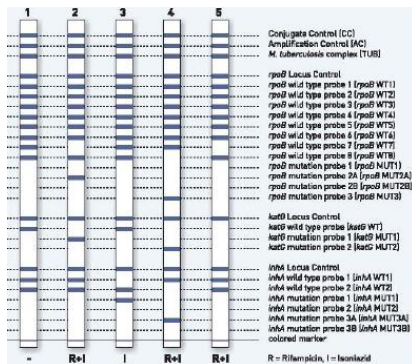


Table 15: Tuberculosis cases by *M. tuberculosis* complex species, EU & West and Balkans, 2007^a

Geographical area	<i>M. tuberculosis</i>		<i>M. bovis</i>		<i>M. africanum</i>		Unknown or not done		Total culture positive
	N	(%)	N	(%)	N	(%)	N	(%)	
EU									
Austria	135	(25.1)	2	(0.4)	1	(0.2)	400	(74.3)	538
Belgium	803	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	803
Bulgaria	1408	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	1408
Cyprus	31	(93.9)	0	(0.0)	1	(3.0)	1	(3.0)	33
Czech Republic	550	(97.7)	1	(0.2)	0	(0.0)	12	(2.1)	563
Denmark	291	(99.7)	1	(0.3)	0	(0.0)	0	(0.0)	292
Estonia	381	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	381
Finland	-	-	-	-	-	-	226	(100.0)	226
France	-	-	-	-	-	-	2535	(100.0)	2535
Germany	2952	(85.9)	41	(1.2)	19	(0.6)	425	(12.4)	3437
Greece	92	(44.0)	1	(0.5)	0	(0.0)	116	(55.5)	209
Hungary	766	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	766
Ireland	216	(90.8)	5	(2.1)	2	(0.8)	15	(6.3)	238
Italy	459	(25.8)	4	(0.2)	4	(0.2)	1315	(73.8)	1782
Latvia	993	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	993
Lithuania	1686	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	1686
Luxembourg	25	(96.2)	0	(0.0)	0	(0.0)	1	(3.8)	26
Malta	17	(89.5)	0	(0.0)	0	(0.0)	2	(10.5)	19
Netherlands ^b	545	(95.1)	9	(1.6)	0	(0.0)	19	(3.3)	573
Poland	5412	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	5412
Portugal	0	(0.0)	0	(0.0)	0	(0.0)	1986	(100.0)	1986
Romania	4147	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	4147
Slovakia	396	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	396
Slovenia	187	(98.9)	2	(1.1)	0	(0.0)	0	(0.0)	189
Spain	1127	(28.5)	11	(0.3)	8	(0.2)	2803	(71.0)	3949
Sweden	360	(98.6)	4	(1.1)	1	(0.3)	0	(0.0)	365
United Kingdom	4954	(97.6)	24	(0.5)	35	(0.7)	62	(1.2)	5075
Subtotal EU countries	27933	(73.5)	100	(0.3)	71	(0.2)	9923	(26.1)	38027
EEA									
Iceland	11	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	11
Liechtenstein	4	(80.0)	0	(0.0)	0	(0.0)	1	(20.0)	5
Norway	237	(96.7)	2	(0.8)	3	(1.2)	3	(1.2)	245
Subtotal EEA countries	252	(96.6)	2	(0.8)	3	(1.1)	4	(1.5)	261
Total EU/EEA countries	28185	(73.6)	102	(0.3)	74	(0.2)	9927	(25.9)	38288

^a Including only countries reporting case-based data on characterisation of species for > 10% of culture-positive cases

^b Based on case-based data reported by December 2008

Table 10: Tuberculosis cases by *M. tuberculosis* complex species, EU/EEA, 2008

Country	<i>M. tuberculosis</i>		<i>M. bovis</i>		<i>M. africanum</i>		Unknown or not done		Total culture positive
	N	(%)	N	(%)	N	(%)	N	(%)	
Austria	-	-	-	-	-	-	-	-	-
Belgium	810	(99.8)	2	(0.2)	0	(0.0)	0	(0.0)	812
<i>Bulgaria</i>	<i>1361</i>	<i>(100.0)</i>	<i>0</i>	<i>(0.0)</i>	<i>0</i>	<i>(0.0)</i>	<i>0</i>	<i>(0.0)</i>	<i>1361</i>
Cyprus	36	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	36
Czech Republic	561	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	561
Denmark	282	(99.6)	0	(0.0)	1	(0.4)	0	(0.0)	283
<i>Estonia</i>	<i>347</i>	<i>(100.0)</i>	<i>0</i>	<i>(0.0)</i>	<i>0</i>	<i>(0.0)</i>	<i>0</i>	<i>(0.0)</i>	<i>347</i>
Finland	248	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	248
France	-	-	-	-	-	-	2296	(100.0)	2296
Germany	2729	(87.7)	47	(1.5)	14	(0.4)	322	(10.3)	3112
Greece	245	(97.2)	0	(0.0)	0	(0.0)	7	(2.8)	252
Hungary	766	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	766
Iceland	5	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	5
Ireland	177	(84.7)	10	(4.8)	0	(0.0)	22	(10.5)	209
Italy	381	(24.9)	1	(0.1)	7	(0.5)	1140	(74.6)	1529
<i>Latvia</i>	<i>838</i>	<i>(100.0)</i>	<i>0</i>	<i>(0.0)</i>	<i>0</i>	<i>(0.0)</i>	<i>0</i>	<i>(0.0)</i>	<i>838</i>
Liechtenstein	-	-	-	-	-	-	-	-	-
<i>Lithuania</i>	<i>1616</i>	<i>(100.0)</i>	<i>0</i>	<i>(0.0)</i>	<i>0</i>	<i>(0.0)</i>	<i>0</i>	<i>(0.0)</i>	<i>1616</i>
Luxembourg	-	-	-	-	-	-	-	-	-
Malta	24	(96.0)	0	(0.0)	1	(4.0)	0	(0.0)	25
Netherlands	700	(96.2)	18	(2.5)	0	(0.0)	10	(1.4)	728
Norway	225	(99.1)	0	(0.0)	2	(0.9)	0	(0.0)	227
Poland	5094	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	5094
Portugal	2006	(100.0)	1	(0.0)	0	(0.0)	0	(0.0)	2007
<i>Romania</i>	<i>14762</i>	<i>(100.0)</i>	<i>0</i>	<i>(0.0)</i>	<i>0</i>	<i>(0.0)</i>	<i>0</i>	<i>(0.0)</i>	<i>14762</i>
Slovakia	383	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	383
Slovenia	194	(96.5)	0	(0.0)	0	(0.0)	7	(3.5)	201
Spain	1206	(26.8)	11	(0.2)	8	(0.2)	3268	(72.7)	4493
Sweden	433	(99.3)	2	(0.5)	1	(0.2)	0	(0.0)	436
United Kingdom	4823	(99.0)	21	(0.4)	26	(0.5)	0	(0.0)	4870
Total EU/EEA	40 252	(84.7)	113	(0.2)	60	(0.1)	7 072	(14.9)	47 497

WHO European Region TB High Priority Countries presented in italics.

^a Including native cases < 26 years old whose parents were born outside Denmark.

^b Of these, 524 were from the Americas and 14 from Western Pacific countries.

Table 10: Tuberculosis cases by *M. tuberculosis* complex species, EU/EEA, 2009^a

Country	<i>M. tuberculosis</i>		<i>M. bovis</i>		<i>M. africanum</i>		Unknown or not done		Total culture-positive
	N	(%)	N	(%)	N	(%)	N	(%)	
Austria	123	(27.6)	2	(0.4)	4	(0.9)	317	(71.1)	446
Belgium	812	(99.6)	3	(0.4)	0	(0.0)	0	(0.0)	815
<i>Bulgaria</i>	1280	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	1280
Cyprus	39	(95.1)	0	(0.0)	0	(0.0)	2	(4.9)	41
Czech Republic	476	(99.8)	0	(0.0)	0	(0.0)	1	(0.2)	477
Denmark	240	(99.2)	0	(0.0)	2	(0.8)	0	(0.0)	242
<i>Estonia</i>	309	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	309
Finland	307	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	307
France	0	(0.0)	0	(0.0)	0	(0.0)	2432	(100.0)	2432
Germany	2599	(86.3)	48	(1.6)	17	(0.6)	347	(11.5)	3011
Greece	306	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	306
Hungary	711	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	711
Iceland	8	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	8
Ireland	221	(91.3)	4	(1.7)	0	(0.0)	17	(7.0)	242
Italy	301	(23.9)	0	(0.0)	7	(0.6)	951	(75.5)	1259
<i>Latvia</i>	772	(99.9)	0	(0.0)	0	(0.0)	1	(0.1)	773
Liechtenstein	-	-	-	-	-	-	-	-	-
<i>Lithuania</i>	1478	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	1478
Luxembourg	27	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	27
Malta	19	(95.0)	0	(0.0)	0	(0.0)	1	(5.0)	20
Netherlands	739	(97.2)	11	(1.4)	0	(0.0)	10	(1.3)	760
Norway	282	(98.9)	1	(0.4)	1	(0.4)	1	(0.4)	285
Poland	5223	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	5223
Portugal	1541	(81.4)	1	(0.1)	0	(0.0)	350	(18.5)	1892
<i>Romania</i>	12351	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	12351
Slovakia	235	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	235
Slovenia	179	(100.0)	0	(0.0)	0	(0.0)	0	(0.0)	179
Spain	1091	(26.6)	17	(0.4)	3	(0.1)	2984	(72.9)	4095
Sweden	498	(96.7)	5	(1.0)	1	(0.2)	11	(2.1)	515
United Kingdom	5015	(98.8)	24	(0.5)	36	(0.7)	0	(0.0)	5075
Total EU/EEA	37182	(83.0)	116	(0.3)	71	(0.2)	7425	(16.6)	44794

WHO European Region TB High Priority Countries presented in italics.

^a *M. tuberculosis* subclassification data have been reported only to TESSy – the numbers differ for other tables reported from Italy.

ORIENTAÇÃO DA DIRECÇÃO-GERAL DA SAÚDE

Francisco
Henrique
Moura
George

Digitally signed by
Francisco Henrique Moura
George
DN: c=PT, o=Ministério da
Saúde, ou=Direcção Geral
da Saúde em Português,
Henrique Moura George
Date: 2010.12.07 11:57:50 Z

Direcção-Geral da Saúde
www.dgs.pt



Ministério da Saúde

NÚMERO: 013/2010

DATA: 07/12/2010

ASSUNTO: Vigilância da tuberculose zoonótica por *Mycobacterium bovis* em seres humanos

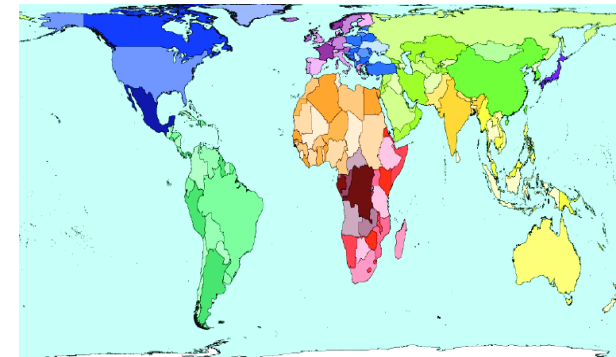
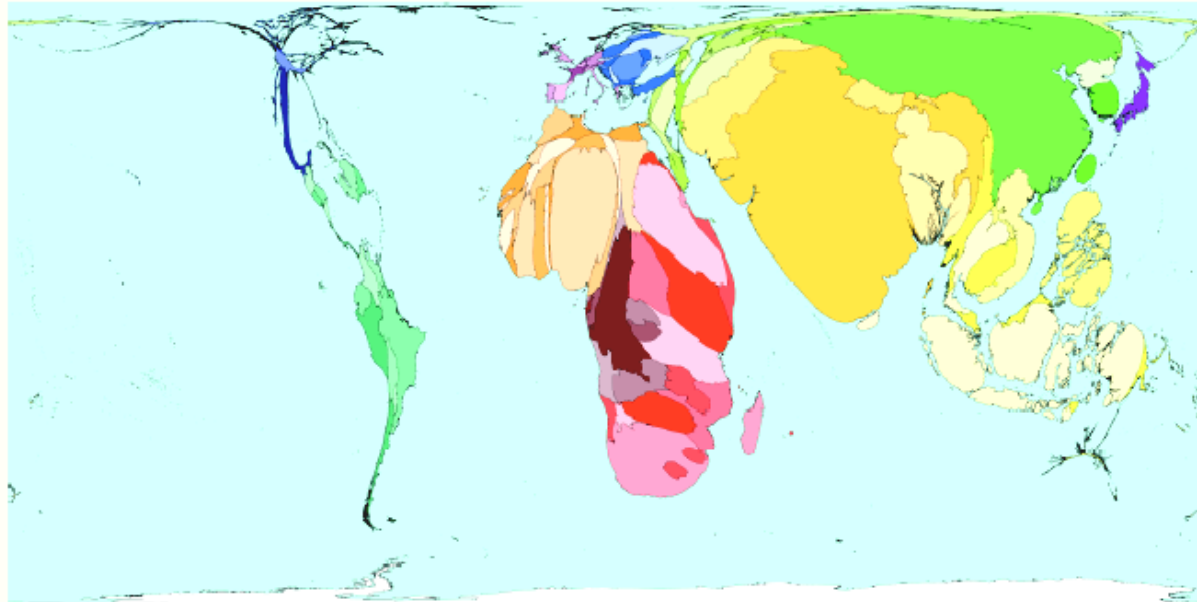
PALAVRAS-CHAVE: Tuberculose, Zoonose, *Mycobacterium bovis*

PARA: Todos os serviços de saúde

CONTACTOS: Programa Nacional de Luta Contra a Tuberculose (PNT); A. Fonseca Antunes (afantunes@dgs.pt) ou Ana Rita Macedo (rita.macedo@dgs.pt)

Justificação:

A infecção por *M. bovis* em seres humanos é hoje em dia considerada pouco frequente nos países industrializados, sendo essencialmente considerada como uma zoonose ocupacional ou resultado de reactivação de infecções antigas. São considerados grupos de maior risco, as comunidades rurais, criadores e tratadores de gado, trabalhadores dos matadouros e da indústria da carne, veterinários e empregados dos zoológicos. Em Portugal, não está ainda determinada a importância do *M. bovis* na tuberculose humana, visto não ter sido prática comum laboratorial fazer a diferenciação do complexo *M. tuberculosis*. Assim, considerando o aumento significativo da tuberculose bovina e a evidência de uma elevada prevalência noutros animais em certas regiões do país (3), importa implementar um sistema de vigilância da infecção humana por *M. bovis* (*spp bovis*, não incluindo a variante BCG).

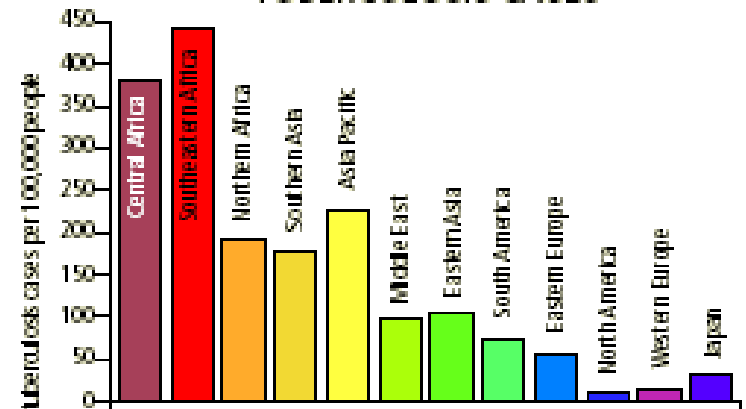


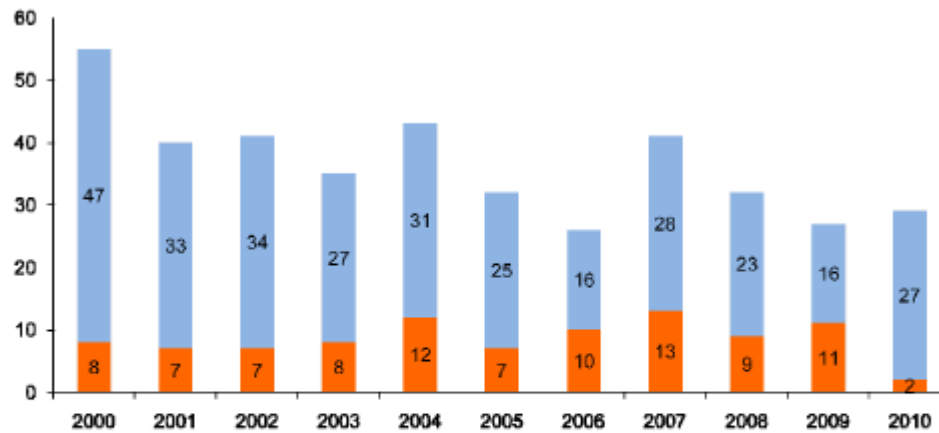
HIGHEST AND LOWEST TUBERCULOSIS PREVALENCE

Rank	Territory	Value	Rank	Territory	Value
1	Swaziland	1083	188	Canada	6
2	Djibouti	735	188	Australia	6
3	Lesotho	733	188	Norway	6
4	Namibia	722	194	Grenada	5
5	Zimbabwe	659	194	Jordan	5
6	Zambia	656	194	United States	5
7	Botswana	633	197	Cyprus	4
8	Kenya	610	197	Sweden	4
9	Timor-Leste	556	199	Iceland	3
10	South Africa	536	200	Monaco	2

tuberculosis cases per 100,000 people 2003

TUBERCULOSIS CASES

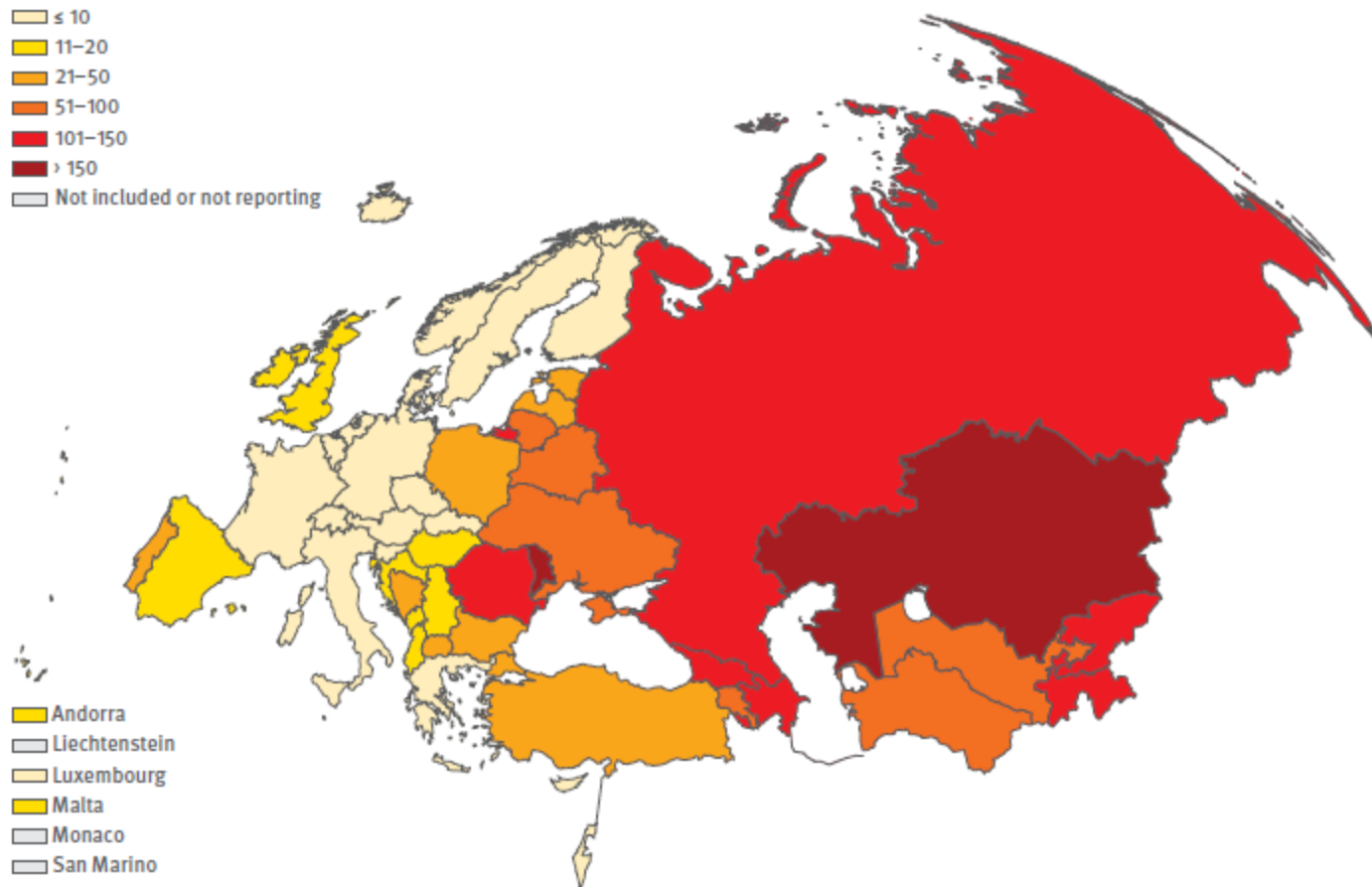




TBMR (%) 3,1 2,3 2,4 2,1 2,4 1,9 1,5 2,1 1,7 1,5

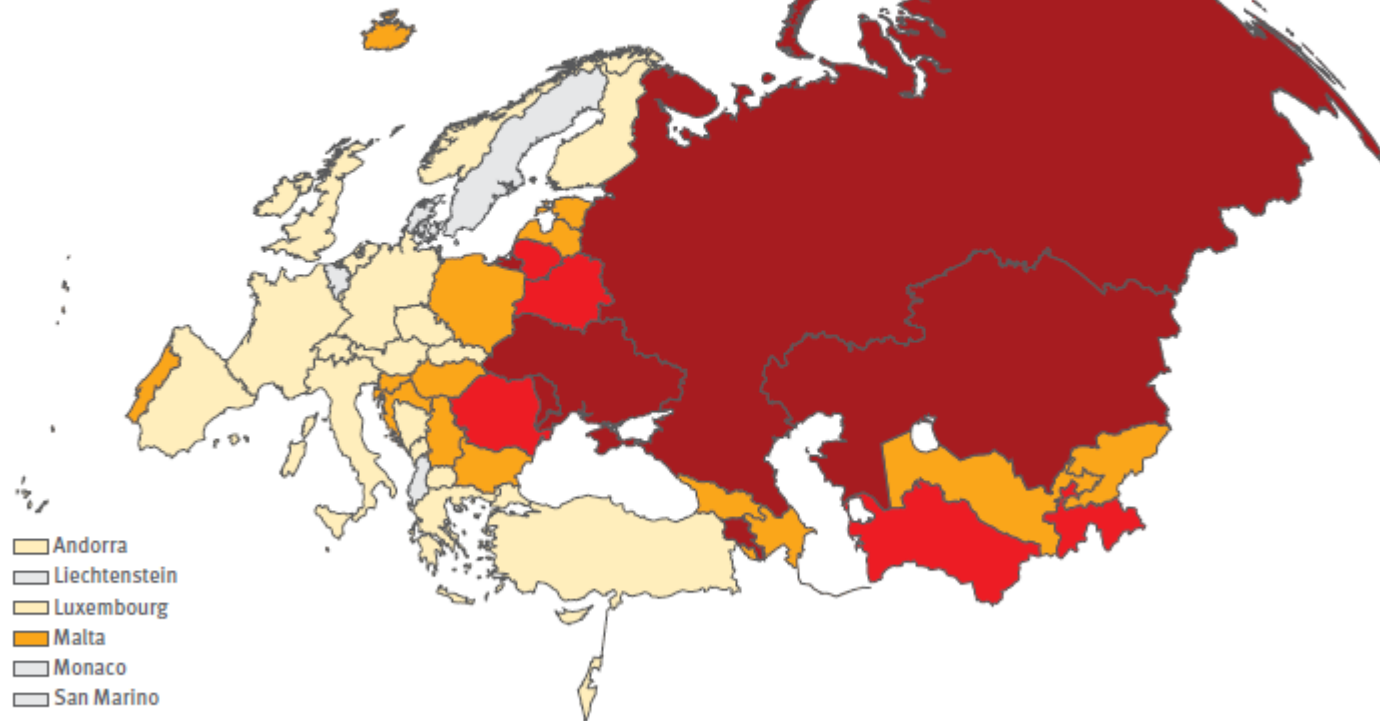
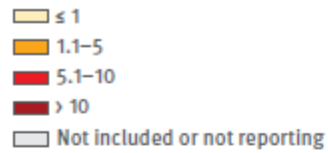
Figura 9. Número de casos incidentes de TBMR por ano, de 2000-10 compreendendo a multiresistência limitada às drogas de 1ª linha (barras azuis) e a XDR (barras encarnadas). Fonte: SVIG-TB e SVIG-TBMR actualizada em Março de 2011.

Map 1: Total TB notification rates per 100 000 population, Europe, 2009*



* Data from Kosovo (in accordance with Security Council Resolution 1244 (1999)) is not included in the figures reported for Serbia

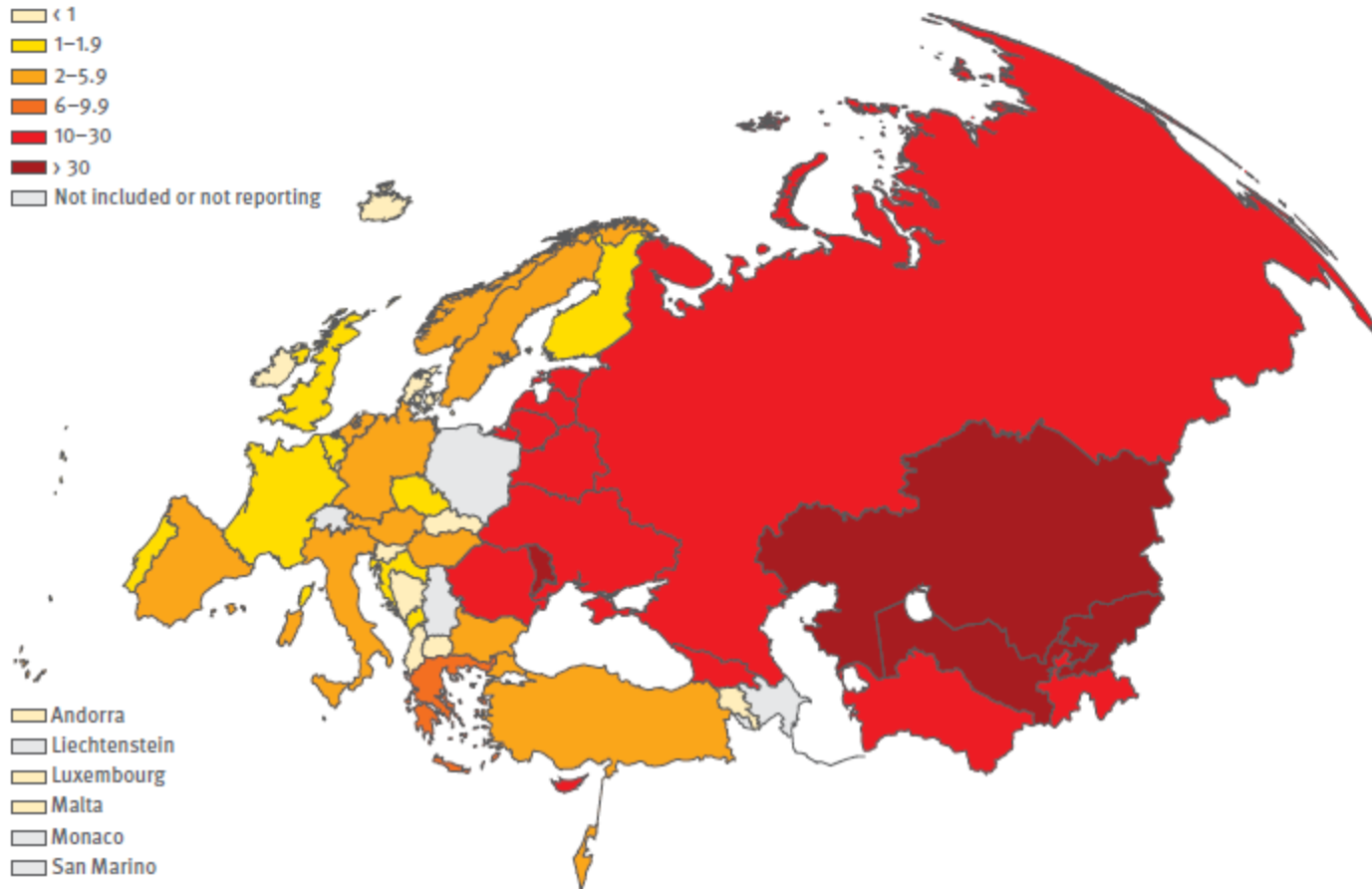
Map 3: TB mortality rates per 100 000 population, Europe, 2007–2009*



- Andorra
- Liechtenstein
- Luxembourg
- Malta
- Monaco
- San Marino

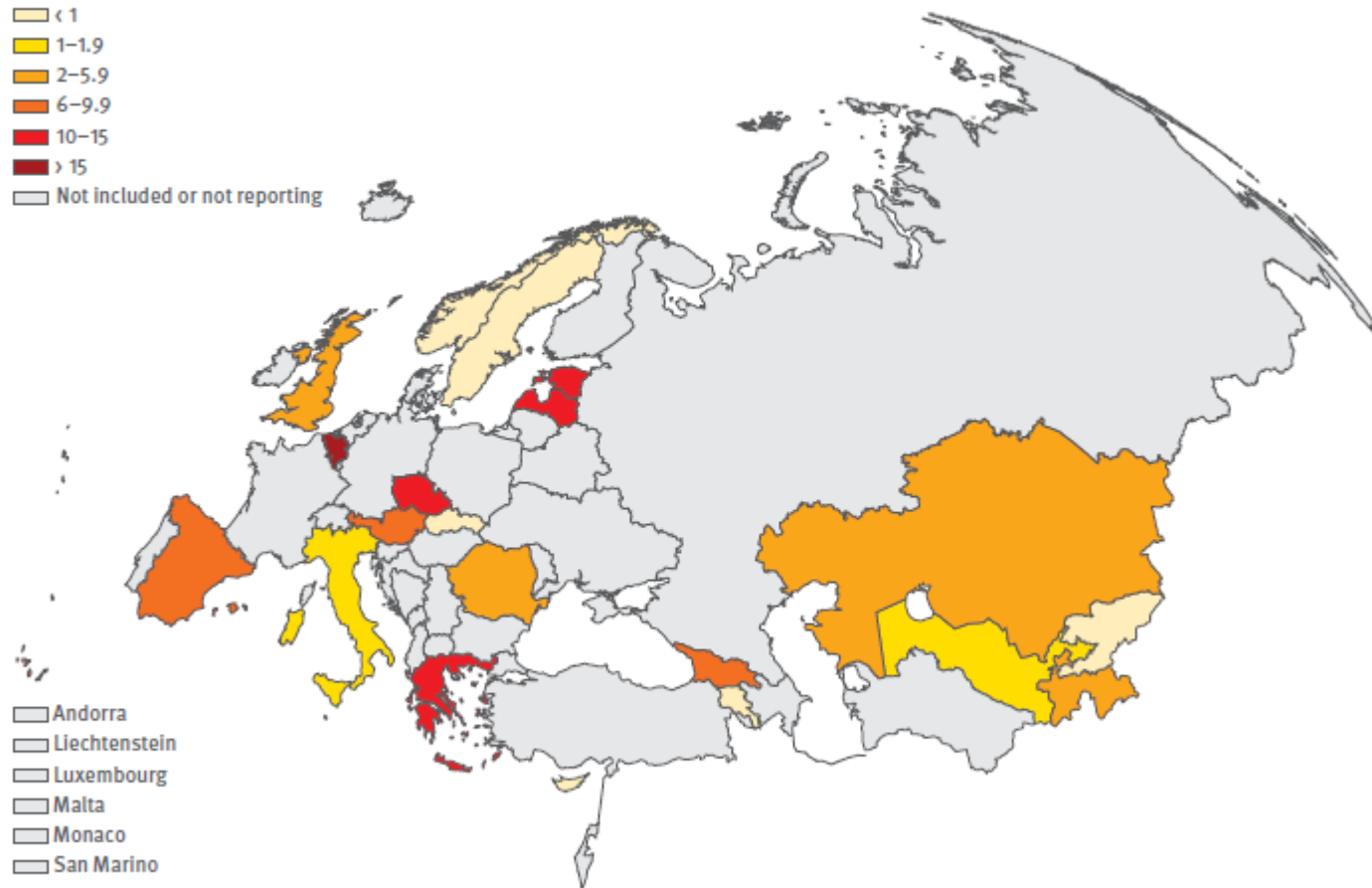
* Data from Kosovo (in accordance with Security Council Resolution 1244 (1999)) is not included in the figures reported for Serbia

Map 8: Percentage of notified TB cases with multidrug resistance among all TB cases with DST, Europe, 2009*



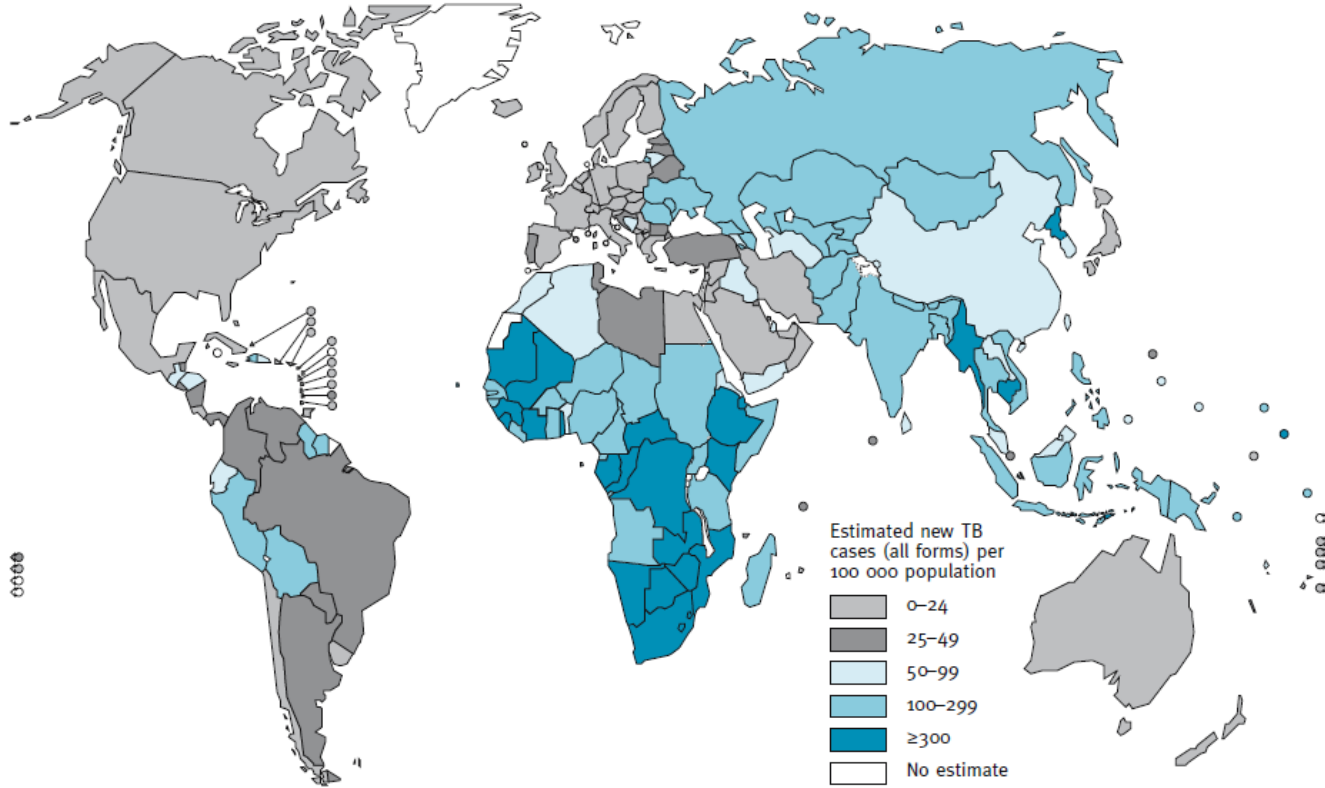
* Data from Kosovo (in accordance with Security Council Resolution 1244 (1999)) is not included in the figures reported for Serbia

Map 9: Percentage of notified TB cases with extensively drug resistance among MDR-TB cases, Europe, 2009*

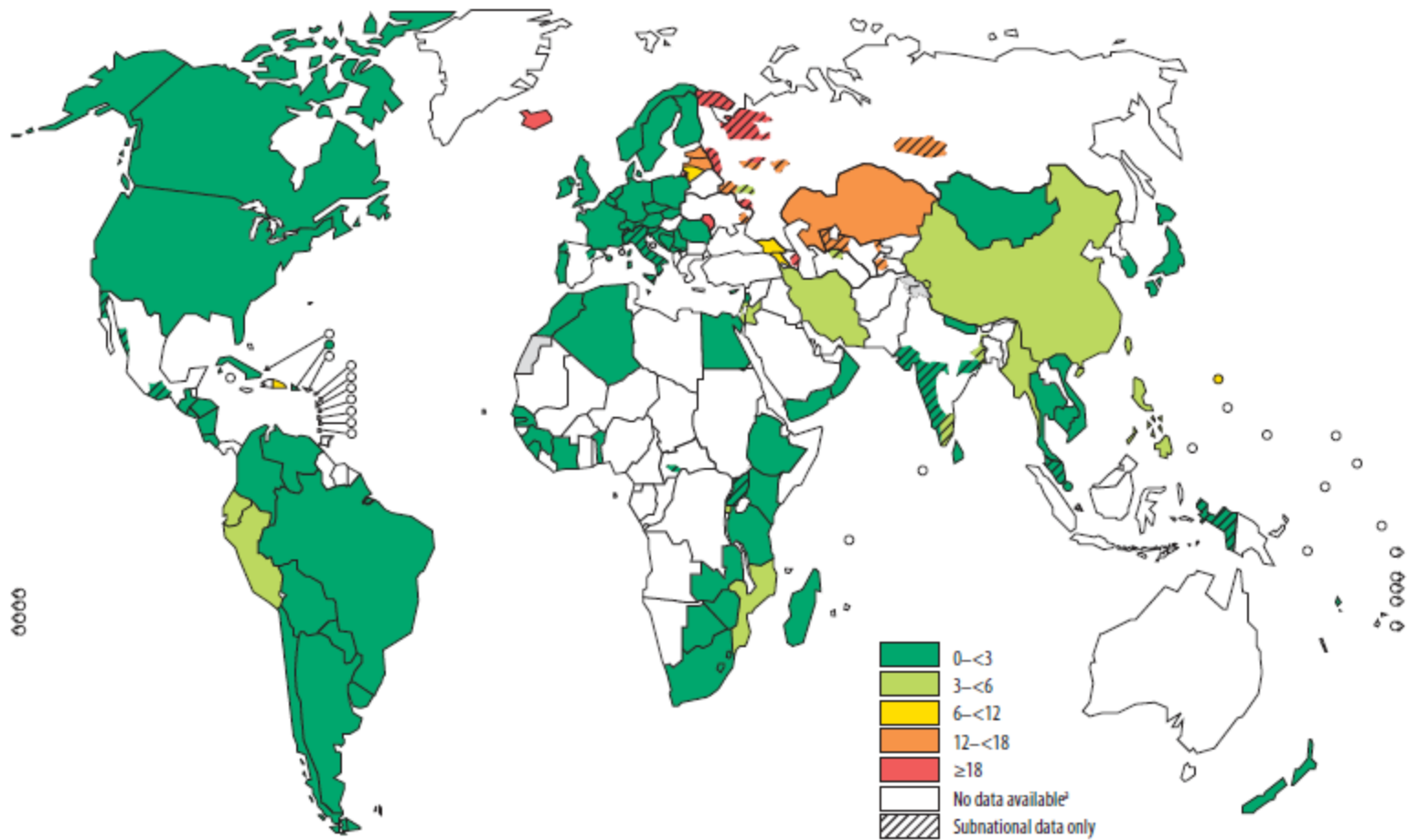


* Data from Kosovo (in accordance with Security Council Resolution 1244 (1999)) is not included in the figures reported for Serbia

FIGURE 1
Estimated TB incidence rates, by country, 2009

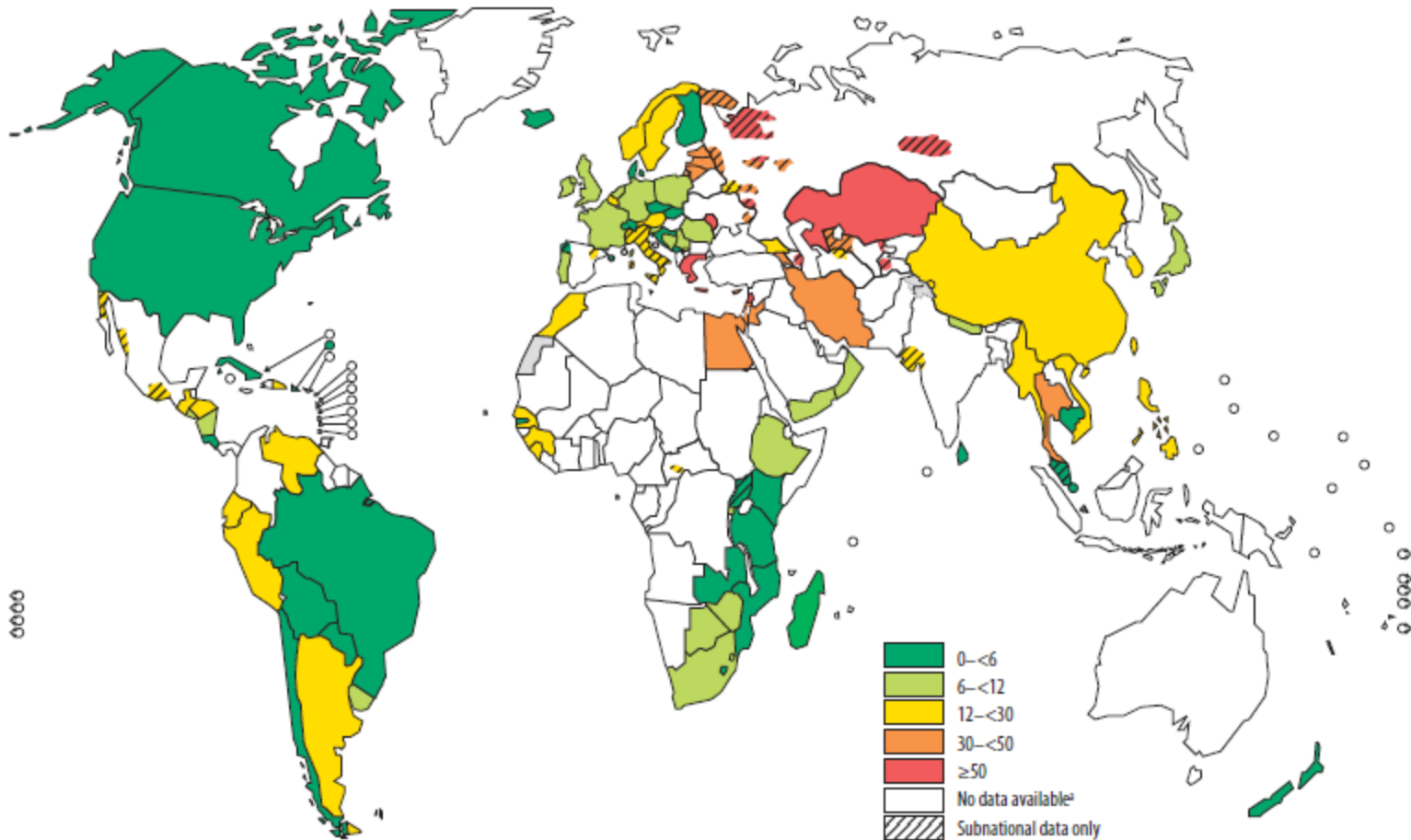


MAP 3 Distribution of proportion of MDR-TB among new TB cases, 1994–2009



² Australia, Democratic Republic of the Congo, Fiji, Guam, New Caledonia, Solomon Islands and Qatar reported data on combined new and previously treated cases.

MAP 4 Distribution of proportion of MDR-TB among previously treated TB cases, 1994–2009



^a Australia, Democratic Republic of the Congo, Fiji, Guam, New Caledonia, Solomon Islands and Qatar reported data on combined new and previously treated cases.

MAP 7 Distribution of countries and territories reporting at least one case of XDR-TB as of January 2010

