

ANNEXES



Annex 1: Prevalence (%) of drug resistance among new TB cases, by country/geographical setting and WHO region (1999-2002)

COUNTRY/SETTING	Year	No. of PATIENTS TESTED	OVERALL		RESISTANCE ^a TO:			Poly-resistance	MDR
			Susceptible	Resistant	1 Drug	2 Drugs	3+ Drugs		
Africa									
Algeria	2001	518	93.8	6.2	4.1	1.0	1.2	1.0	1.2
Botswana	2002	469	86.4	13.6	9.0	3.4	1.3	3.4	1.3
The Gambia	1999	210	95.7	4.3	3.8	0.5	0.0	0.0	0.5
South Africa - Eastern Cape	2001	506	88.7	11.3	7.9	2.8	0.6	2.4	1.0
South Africa - Free State	2001	414	91.4	8.6	5.5	1.5	1.5	1.3	1.8
South Africa - Gauteng	2001	592	93.4	6.6	4.1	1.5	1.0	1.2	1.4
South Africa - Kwazulu-Natal	2001	595	93.4	6.6	3.7	1.0	1.8	1.2	1.7
South Africa - Limpopo	2001	451	92.9	7.1	2.9	2.4	1.8	1.8	2.4
South Africa - North West	2001	631	91.9	8.1	4.4	1.8	1.3	1.3	2.2
South Africa - Western Cape	2001	427	94.4	5.6	3.1	2.3	0.2	1.6	0.9
Zambia	2000	445	88.5	11.5	8.5	2.0	0.9	1.1	1.8
**South Africa - Mpumalanga	2001	702	90.6	9.4	5.6	2.1	1.1	1.3	2.6
Median		469	92.9	7.1	4.1	1.8	1.2	1.3	1.4
Americas									
Argentina	1999	679	89.8	9.7	7.5	1.2	1.5	0.9	1.8
Canada	2000	1244	91.5	8.5	5.8	1.8	0.7	1.9	0.7
Colombia	1999	1087	84.5	15.5	9.4	4.6	1.6	4.7	1.5
Cuba	2000	377	95.0	5.0	3.7	1.3	0.0	1.1	0.3
Ecuador	2002	394	76.6	23.4	12.9	8.4	2.0	3.8	6.6
El Salvador	2001	611	94.3	5.7	4.9	0.8	0.0	0.5	0.3
Honduras	2002	169	82.8	17.2	11.2	4.7	1.2	4.1	1.8
Puerto Rico	2001	100	88.0	12.0	6.0	5.0	1.0	4.0	2.0
Uruguay	1999	315	96.8	3.2	2.9	0.3	0.0	0.0	0.3
United States of America	2001	9751	87.3	12.7	8.8	2.8	1.1	2.7	1.1
Venezuela	1998	769	92.5	7.5	4.9	2.2	0.4	2.1	0.5
**Chile	2001	867	89.5	11.7	8.2	2.7	0.8	2.7	0.7
Median		554	90.3	9.7	6.0	2.2	1.0	2.1	1.1
Eastern Mediterranean									
Egypt	2002	632	69.5	30.5	21.7	6.5	2.4	6.6	2.2

COUNTRY/SETTING	Year	No. of PATIENTS TESTED	OVERALL		RESISTANCE ^a TO:				Poly-resistance	MDR
			Susceptible	Resistant	1 Drug	2 Drugs	3+Drugs			
Oman	2001	171	94.7	5.3	4.7	0.6	0.0	0.0	0.6	0.0
Qatar	2001	284	90.1	9.9	7.0	2.8	0.0	0.0	2.5	0.4
Median		284	90.1	9.9	7.0	2.8	0.0	0.0	2.5	0.4
Europe										
Andorra	2000	3	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Austria	2000	694	95.5	4.5	3.0	1.0	0.4	1.0	0.4	0.4
Belgium	2000	562	94.0	6.0	4.5	1.2	0.3	0.4	0.4	1.2
Bosnia and Herzegovina	2000	993	97.6	2.4	2.0	0.4	0.0	0.3	0.1	0.1
Croatia	2000	780	98.2	1.8	1.5	0.3	0.0	0.1	0.1	0.1
Czech Republic	2000	616	95.6	4.4	2.6	1.1	0.6	0.6	0.6	1.1
Denmark	2000	392	88.0	12.0	7.1	4.6	0.3	4.6	0.3	0.3
Estonia	2000	410	71.5	28.5	10.7	4.4	13.4	5.6	12.2	12.2
Finland	2000	374	95.5	4.5	3.2	1.1	0.3	1.1	0.3	0.3
France	2000	947	90.7	9.3	7.3	1.5	0.5	1.2	0.8	0.8
Germany	2000	1561	93.2	6.8	4.5	1.4	0.9	1.5	0.8	0.8
Iceland	2000	8	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ireland	2000	136	97.1	2.9	2.2	0.7	0.0	0.0	0.0	0.7
Israel	2000	253	68.8	31.2	11.9	4.7	14.6	5.1	14.2	14.2
Italy	2000	688	88.7	11.3	7.0	3.3	1.0	3.2	1.2	1.2
Kazakhstan	2001	359	42.9	57.1	13.9	17.8	25.3	29.0	14.2	14.2
Latvia	2000	897	68.3	31.7	9.3	12.2	10.3	13.2	9.3	9.3
Lithuania	2002	819	70.8	29.2	10.4	8.2	10.6	9.4	9.4	9.4
Luxembourg	2000	39	92.3	7.7	7.7	0.0	0.0	0.0	0.0	0.0
Malta	2000	9	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands	2000	768	89.3	10.7	7.8	2.5	0.4	2.0	0.9	0.9
Norway	2000	160	75.6	24.4	15.0	9.4	0.0	7.5	1.9	1.9
Poland	2001	3037	93.9	6.1	4.0	1.3	0.8	1.0	1.2	1.2
Russian Federation - OreI Oblast	2002	379	78.9	21.1	5.3	9.8	6.1	13.2	2.6	2.6
Russian Federation - Tomsk Oblast	2002	533	62.7	37.3	10.5	13.3	13.5	13.1	13.7	13.7
Serbia and Montenegro-Belgrade	2000	249	94.4	5.6	4.8	0.4	0.4	0.4	0.4	0.4
Slovakia	2000	465	95.9	4.1	2.4	1.3	0.4	0.6	1.1	1.1
Slovenia	2000	282	97.5	2.5	2.4	0.7	0.0	0.7	0.0	0.0
Spain - Barcelona	2001	133	89.5	10.5	7.5	2.3	0.8	2.3	0.8	0.8
Spain - Galicia	2001	360	88.3	11.7	9.7	0.6	1.4	0.6	1.4	1.4

^a Small differences may appear between the variable "overall resistance" and "resistance to 1 drug+2 drugs+3drugs", due to rounding.

COUNTRY/SETTING	Year	No. of PATIENTS TESTED	OVERALL		RESISTANCE ^a TO:			Poly-resistance	MDR
			Susceptible	Resistant	1 Drug	2 Drugs	3+Drugs		
Sweden	2000	322	88.8	11.2	7.8	2.8	0.6	2.2	1.2
Switzerland	2000	330	94.5	5.5	5.5	0.0	0.0	0.0	0.0
Turkmenistan - Dashoquz	2001	105	69.5	30.5	21.0	4.8	4.8	5.7	3.8
United Kingdom - England, Wales, Northern Ireland	2000	2312	91.6	8.4	6.4	1.3	0.6	1.1	0.9
Uzbekistan - Karakalpakstan	2001	106	51.9	48.1	15.1	13.2	19.8	19.8	13.2
Median		379	91.6	8.4	6.4	1.3	0.6	1.1	0.9
South-East Asia									
India - North Arcot	1999	282	72.3	27.7	16.7	7.1	3.9	8.2	2.8
India - Raichur District	1999	278	78.1	21.9	15.5	4.0	2.5	4.0	2.5
India - Wardha District	1999	197	80.2	19.8	15.2	4.6	0.0	4.1	0.5
Nepal	2001	755	89.0	11.0	7.0	2.8	1.2	2.6	1.3
Thailand	2001	1505	85.2	14.8	10.5	3.5	0.9	3.4	0.9
Median		282	80.2	19.8	15.2	4.0	1.2	4.0	1.3
Western Pacific									
Cambodia	2001	638	89.7	10.3	8.5	1.9	0.0	1.9	0.0
China - Henan	2001	1222	70.1	29.9	15.6	7.2	7.0	6.5	7.8
China - Hong Kong SAR	2001	3470	89.8	10.2	7.0	2.4	0.8	2.4	0.8
China - Hubei	1999	859	82.5	17.5	10.9	5.1	1.4	4.4	2.1
China - Liaoning	1999	818	57.9	42.1	21.6	10.6	9.8	10.0	10.4
Japan	1997	1374	89.7	10.3	7.6	2.1	0.6	1.8	0.9
Mongolia	1999	405	70.6	29.4	18.3	9.6	1.5	10.1	1.0
New Zealand	2001	272	88.6	11.4	9.2	2.2	0.0	2.2	0.0
Singapore	2001	823	95.0	5.0	3.2	1.2	0.6	1.3	0.5
Median		823	88.6	11.4	9.2	2.4	0.8	2.5	0.9
Overall Median		459	89.8	10.2	7.0	2.2	0.8	1.9	1.1
Overall Minimum		3	42.9	0.0	0.0	0.0	0.0	0.0	0.0
Overall Maximum		9751	100.0	57.1	21.7	17.8	25.3	29.0	14.2

^a Small differences may appear between the variable "overall resistance" and "resistance to 1 drug+2 drugs+3drugs", due to rounding.

Annex 2: Prevalence (%) of resistance to specific drugs among new TB cases, by country/geographical setting and WHO region (1999-2002)

COUNTRY/SETTING	Year	No. of PATIENTS TESTED	INH		RMP		EMB		SM	
			MONO	ANY	MONO	ANY	MONO	ANY	MONO	ANY
Africa										
Algeria	2001	518	1.0	3.1	0.0	1.2	0.0	0.0	3.1	5.2
Botswana	2002	469	1.9	5.5	1.3	3.2	0.4	2.1	5.3	9.2
The Gambia	1999	210	1.9	2.4	0.5	1.0	0.0	0.0	1.4	1.4
South Africa - Eastern Cape	2001	506	3.8	7.1	0.2	1.2	0.0	0.7	4.0	6.7
South Africa - Free State	2001	414	3.3	6.4	0.7	2.4	0.0	0.7	1.5	4.0
South Africa - Gauteng	2001	592	1.9	4.4	0.3	1.7	0.0	0.3	1.9	3.8
South Africa - Kwazulu-Natal	2001	595	2.5	5.4	0.2	1.8	0.0	0.8	1.0	3.9
South Africa - Limpopo	2001	451	1.3	5.5	0.0	2.4	0.0	2.2	1.6	4.0
South Africa - North West	2001	631	2.2	5.9	0.5	2.7	0.0	1.3	1.7	4.4
South Africa - Western Cape	2001	427	2.6	5.2	0.0	0.9	0.0	0.0	0.5	2.3
Zambia	2000	445	3.4	6.3	0.0	1.8	0.7	2.0	4.5	5.4
**South Africa - Mpumalanga	2001	702	3.1	7.0	0.6	3.1	0.0	1.0	1.9	4.1
Median		469	2.2	5.5	0.2	1.8	0.0	0.7	1.7	4.0
Americas										
Argentina	1999	554	1.8	4.3	0.4	2.2	0.4	2.0	4.5	7.0
Canada	2000	1244	4.3	6.8	0.0	0.9	0.2	1.0	1.4	3.5
Colombia	1999	1087	3.4	9.5	0.1	1.7	0.3	0.8	5.6	11.5
Cuba	2000	377	0.3	1.1	0.0	0.8	0.0	0.0	3.4	4.5
Ecuador	2002	394	4.8	14.0	2.3	10.2	0.3	0.8	5.6	10.9
El Salvador	2001	611	0.5	1.3	0.8	1.1	0.3	0.3	3.3	3.8
Honduras	2002	169	1.2	6.5	0.0	2.4	0.0	1.2	10.1	14.8
Puerto Rico	2001	100	3.0	8.0	0.0	3.0	0.0	0.0	3.0	8.0
Uruguay	1999	315	1.3	1.6	0.0	0.3	0.0	0.0	1.6	1.6
United States of America	2001	9751	4.0	7.7	0.2	1.5	0.4	1.6	4.1	7.4
Venezuela	1998	769	1.7	3.9	0.4	1.0	0.1	1.0	2.7	4.7
**Chile	2001	867	1.5	5.0	0.1	0.9	0.0	0.2	6.56	10.0
Median		554	1.8	6.5	0.1	1.5	0.2	1.0	3.4	7.0
Eastern Mediterranean										
Egypt	2002	632	2.7	9.8	3.5	7.0	0.5	2.8	15.0	23.6

**Not included in analysis or median calculations

ANNEXES

COUNTRY/SETTING	Year	No. of PATIENTS TESTED	INH		RMP		EMB		SM		
			MONO	ANY	MONO	ANY	MONO	ANY	MONO	ANY	
Oman	2001	171	3.5	4.1	0.6	0.6	0.0	0.0	0.0	0.6	1.2
Qatar	2001	284	4.2	6.7	0.4	1.1	0.7	1.8	1.8	1.8	3.2
Median		284	3.5	6.7	0.6	1.1	0.5	1.8	1.8	1.8	3.2
Europe											
Andorra	2000	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Austria	2000	694	1.4	2.9	0.3	0.7	0.1	0.1	0.1	1.2	2.6
Belgium	2000	562	3.7	5.3	0.4	1.6	0.4	1.1	-	-	-
Bosnia and Herzegovina	2000	993	0.3	0.5	0.6	0.7	0.9	1.1	0.2	0.5	0.5
Croatia	2000	780	0.8	1.0	0.0	0.1	0.0	0.0	0.0	0.8	0.9
Czech Republic	2000	616	1.6	3.4	0.0	1.1	0.2	0.8	0.8	2.0	2.0
Denmark	2000	392	2.8	7.4	0.0	0.5	0.0	0.8	4.3	8.7	8.7
Estonia	2000	410	5.1	22.9	0.0	12.2	0.0	13.2	5.6	22.4	22.4
Finland	2000	374	1.3	2.7	0.5	0.8	0.0	0.3	1.3	2.4	2.4
France	2000	947	0.5	2.5	0.0	0.8	0.8	2.1	5.9	6.4	6.4
Germany	2000	1561	1.7	3.9	0.3	1.0	0.3	1.0	2.2	4.2	4.2
Iceland	2000	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ireland	2000	136	2.2	2.9	0.0	0.7	0.0	0.0	0.0	0.0	0.0
Israel	2000	253	6.3	25.7	0.4	14.6	1.2	9.9	4.0	22.1	22.1
Italy	2000	688	2.0	6.4	0.4	1.6	0.6	1.5	3.9	7.8	7.8
Kazakhstan	2001	359	3.1	42.6	0.3	15.6	0.8	24.8	9.7	51.5	51.5
Latvia	2000	897	6.6	29.0	0.0	9.3	0.2	6.2	2.5	24.4	24.4
Lithuania	2002	819	6.6	25.4	0.4	9.8	0.0	7.3	3.4	21.7	21.7
Luxembourg	2000	39	5.1	5.1	0.0	0.0	0.0	0.0	2.6	2.6	2.6
Malta	2000	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands	2000	768	2.9	5.6	0.1	0.9	0.1	0.7	5.1	6.9	6.9
Norway	2000	160	4.4	13.1	0.0	2.5	5.0	6.9	5.6	11.3	11.3
Poland	2001	3037	2.0	4.1	0.3	1.4	0.0	0.6	1.7	3.4	3.4
Russian Federation - Orel Oblast	2002	379	2.1	17.9	0.0	2.6	0.0	4.7	3.2	19.0	19.0
Russian Federation - Tomsk Oblast	2002	533	2.4	29.1	0.4	14.3	0.0	4.3	7.7	34.1	34.1
Serbia and Montenegro-Belgrade	2000	249	1.2	1.6	1.6	2.0	0.4	0.8	1.6	2.4	2.4
Slovakia	2000	465	1.7	3.2	0.2	1.5	0.0	0.2	0.4	1.3	1.3
Slovenia	2000	282	1.4	2.1	0.0	0.0	0.0	0.0	0.4	1.1	1.1
Spain - Barcelona	2001	133	3.8	6.0	0.0	1.5	0.0	0.0	3.8	6.8	6.8
Spain - Galicia	2001	360	2.5	4.4	0.0	1.4	0.6	2.2	6.7	7.2	7.2
Sweden	2000	322	7.5	10.9	0.0	1.2	0.0	0.6	0.3	2.5	2.5

COUNTRY/SETTING	Year	No. of PATIENTS TESTED	INH		RMP		EMB		SM	
			MONO	ANY	MONO	ANY	MONO	ANY	MONO	ANY
Switzerland	2000	330	5.5	5.5	0.0	0.0	0.0	0.0	-	-
Turkmenistan - Dashoguz	2001	105	5.7	15.2	0.0	3.8	0.0	1.9	15.2	24.8
United Kingdom - England, Wales, Northern Ireland	2000	2312	4.0	6.0	0.3	1.2	0.0	0.5	-	-
Uzbekistan - Karakalpakstan	2001	106	3.8	36.8	0.0	13.2	0.0	15.1	11.3	44.3
Median		379	2.4	5.3	0.0	1.2	0.0	0.8	2.5	4.1
South-East Asia										
India - North Arcot	1999	282	12.8	23.4	0.0	2.8	0.4	4.6	3.5	12.4
India - Raichur District	1999	278	12.2	18.7	0.0	2.5	0.0	3.2	3.2	7.2
India - Wardha District	1999	197	10.7	15.2	0.0	0.5	0.0	1.0	4.6	7.6
Nepal	2001	755	1.6	5.4	0.3	1.7	0.0	0.9	5.2	8.9
Thailand	2001	1505	5.3	9.5	0.3	1.4	0.1	1.1	4.8	8.2
Median		282	10.7	15.2	0.0	1.7	0.0	1.1	4.6	8.2
Western Pacific										
Cambodia	2001	638	4.7	6.4	0.5	0.6	0.0	0.2	3.3	5.0
China - Henan	2001	1222	3.3	17.0	1.5	9.7	0.8	4.3	10.1	22.2
China - Hong Kong SAR	2001	3470	2.3	5.5	0.2	1.0	0.0	0.5	4.5	7.5
China - Hubei	1999	859	3.7	9.7	1.2	3.8	0.1	0.6	5.9	11.4
China - Liaoning	1999	818	5.4	25.3	0.5	11.4	0.2	3.8	15.5	34.1
Japan	1997	1374	2.0	4.4	0.2	1.4	0.1	0.4	5.2	7.5
Mongolia	1999	405	4.4	15.3	0.2	1.2	0.0	1.7	13.6	24.2
New Zealand	2001	272	4.4	6.3	0.0	0.4	0.4	0.7	4.4	6.3
Singapore	2001	823	1.6	3.3	0.0	0.6	0.1	0.7	1.5	3.0
Median		823	3.7	6.4	0.3	1.2	0.1	0.7	5.2	7.5
Overall Median		459	2.6	5.9	0.2	1.4	0.0	0.8	3.3	6.3
Overall Minimum		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Overall Maximum		9751	12.8	42.6	3.5	15.6	5.0	24.8	15.5	51.5

**Not included in analysis or median calculations

Annex 3: Prevalence (%) of drug resistance among previously treated TB cases, by country/geographical setting and WHO region (1999-2002)

COUNTRY/SETTING	Year	No. of PATIENTS TESTED	OVERALL		RESISTANCE ^a TO:			Poly-resistance	MDR
			Susceptible	Resistant	1 Drug	2 Drugs	3+ Drugs		
Africa									
Botswana	2002	66	69.7	30.3	9.1	12.1	9.1	7.6	13.6
The Gambia	1999	15	100.0	0.0	0.0	0.0	0.0	0.0	0.0
South Africa - Eastern Cape	2001	283	82.3	17.7	7.4	7.4	2.8	2.8	7.8
South Africa - Free State	2001	174	90.8	9.2	6.3	2.3	.5	1.1	1.8
South Africa - Gauteng	2001	165	87.3	12.7	3.1	5.5	4.3	4.2	5.5
South Africa - Kwazulu-Natal	2001	207	81.6	18.4	8.2	4.3	5.8	2.4	7.7
South Africa - Limpopo	2001	88	83.0	17.0	9.0	4.5	3.4	1.1	7.0
South Africa - North West	2001	188	80.9	19.1	8.5	6.9	3.7	3.7	6.9
South Africa - Western Cape	2001	228	92.1	7.9	3.5	2.1	2.1	0.4	3.9
**South Africa - Mpumalanga	2001	175	76.6	23.4	6.9	5.2	11.5	2.9	13.7
Zambia	2000	44	84.1	15.9	11.4	4.5	0.0	0.0	2.3
Median		169	83.3	16.7	7.8	4.6	3.1	1.8	5.9
Americas									
Argentina	1999	149	77.2	22.8	10.1	3.4	5.4	3.4	9.4
Canada	2000	119	83.2	16.8	10.9	2.5	3.4	2.5	3.4
Cuba	2000	38	84.2	15.8	7.9	5.3	2.6	5.3	2.6
Ecuador	2002	133	52.6	47.4	16.5	18.8	12.0	6.0	24.8
El Salvador	2001	100	78.0	22.0	12.0	6.0	4.0	3.0	7.0
Honduras	2002	29	58.6	41.4	27.6	6.9	6.9	6.9	6.9
Puerto Rico	2000	4	75.0	25.0	0.0	0.0	25.0	0.0	25.0
United States	2001	537	81.2	18.8	11.0	3.9	3.9	2.6	5.2
Venezuela	1998	104	69.2	30.8	11.5	7.7	11.5	5.8	13.5
**Chile	2001	291	74.9	25.1	16.0	4.3	4.7	4.3	4.8
Median		104	75.4	24.6	11.5	5.3	6.9	3.7	7.0
Eastern Mediterranean									
Egypt	2002	217	31.8	68.2	18.4	11.1	38.7	11.5	38.2
Oman	2001	12	41.7	58.3	0.0	0.0	58.3	0.0	58.3
Median		114.5	36.7	63.3	9.2	5.5	48.5	5.8	48.3

COUNTRY/SETTING	Year	No. of PATIENTS TESTED	OVERALL		RESISTANCE ^a TO:				Poly-resistance	MDR
			Susceptible	Resistant	1 Drug	2 Drugs	3+Drugs			
Europe										
Austria	2000	67	91.0	9.0	7.5	0.0	0.0	1.5	0.0	1.5
Belgium	2000	78	85.9	14.1	7.7	2.6	3.8	1.3	1.3	5.1
Bosnia and Herzegovina	2000	153	86.9	13.1	8.5	2.6	2.0	2.6	2.6	2.0
Croatia	2000	99	93.9	6.1	5.1	0.0	1.0	0.0	0.0	1.0
Czech Republic	2000	22	86.4	13.6	4.5	4.5	4.5	0.0	0.0	9.1
Denmark	2000	33	72.7	27.3	3.0	21.2	3.0	21.2	3.0	3.0
Estonia	2000	117	41.9	58.1	10.3	4.3	43.6	2.6	2.6	45.3
Finland	2000	29	86.2	13.8	10.3	3.4	0.0	0.0	0.0	3.4
France	2000	82	72.0	28.0	13.4	9.8	4.9	6.1	6.1	8.5
Germany	2000	236	81.8	18.2	6.4	5.9	6.8	5.9	5.9	5.9
Iceland	2000	1	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ireland	2000	26	92.3	7.7	3.8	3.8	0.0	0.0	0.0	3.8
Israel	2000	24	58.3	41.7	16.7	4.2	20.8	4.2	4.2	20.8
Italy	2000	108	52.8	47.2	16.7	14.8	15.7	6.5	6.5	24.1
Kazakhstan	2001	319	17.9	82.1	8.2	11.6	62.4	17.6	17.6	56.4
Latvia	2000	247	61.9	38.1	6.5	5.7	25.9	4.5	4.5	27.1
Lithuania	2002	321	32.1	67.9	8.7	6.9	52.3	5.9	5.9	53.3
Luxembourg	2000	5	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Malta	2000	1	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands	2000	95	91.6	8.4	4.2	2.1	2.1	3.2	3.2	1.1
Norway	2000	10	90.0	10.0	10.0	0.0	0.0	0.0	0.0	0.0
Poland	2001	668	83.4	16.6	5.7	3.9	7.0	2.4	2.4	8.5
Russian Federation - Orel Oblast	2002	210	26.7	73.3	7.1	13.3	52.9	23.8	23.8	42.4
Russian Federation - Tomsk Oblast	2002	117	39.3	60.7	6.8	12.0	41.9	10.3	10.3	43.6
Serbia and Montenegro-Belgrade	2000	30	83.3	16.7	13.3	3.3	0.0	3.3	3.3	0.0
Slovakia	2000	110	86.4	13.6	10.0	2.7	0.9	1.8	1.8	1.8
Slovenia	2000	38	89.5	10.5	7.9	0.0	2.6	2.6	2.6	0.0
Spain-Barcelona	2001	32	68.8	31.3	12.5	9.4	9.4	6.3	6.3	12.5
Spain-Galicia	2001	40	77.5	22.5	10.0	2.5	10.0	5.0	5.0	7.5
Sweden	2000	42	92.9	7.1	4.8	2.4	0.0	0.0	0.0	2.4
Switzerland	2000	57	94.7	5.3	3.5	1.8	0.0	0.0	0.0	1.8
Turkmenistan - Dashoguz	2001	98	37.8	62.2	23.5	14.3	24.5	20.4	20.4	18.4
United Kingdom - England, Wales, Northern Ireland	2000	237	84.8	15.2	8.4	3.4	3.3	2.5	2.5	4.2
Uzbekistan - Karakalpakstan	2001	107	20.6	79.4	17.8	17.8	43.9	21.5	21.5	40.2
Median		78	84.1	15.9	7.8	3.6	3.9	2.6	2.6	4.7

^a Small differences may appear between the variable "overall resistance" and "resistance to 1 drug+2 drugs+3drugs", due to rounding.

**Not included in analysis or median calculations

COUNTRY/SETTING	Year	No. of PATIENTS TESTED	OVERALL		RESISTANCE ^a TO:			Poly-resistance	MDR
			Susceptible	Resistant	1 Drug	2 Drugs	3+Drugs		
South-East Asia									
Nepal	2001	171	59.1	40.9	12.9	11.7	16.4	7.6	20.5
Thailand	2001	172	61.0	39.0	11.6	9.9	17.4	7.0	20.3
Median		171.5	60.1	39.9	12.2	10.8	16.9	7.3	20.4
Western Pacific									
Cambodia	2001	96	82.3	17.7	10.4	5.2	2.1	4.2	3.1
China - Henan	2001	265	39.2	60.8	14.3	15.5	30.9	9.8	36.6
China - Hong Kong SAR	2001	169	76.9	23.1	8.9	3.6	10.7	3.0	11.2
China - Hubei	1999	238	55.5	44.5	13.4	16.4	14.7	9.2	21.8
China - Liaoning	1999	86	44.2	55.8	15.1	20.9	19.8	16.3	24.4
Japan	1997	264	57.6	42.4	15.2	10.2	17.0	7.6	19.7
New Zealand	2001	22	90.9	9.1	4.5	4.5	0.0	4.5	0.0
Singapore	2001	126	88.1	11.9	9.5	1.6	0.8	1.6	0.8
Median		147.5	67.2	32.8	11.9	7.7	12.7	6.1	15.5
Overall Median		100	81.6	18.4	8.7	4.5	4.5	3.2	7.0
Overall Minimum		1	17.9	0.0	0.0	0.0	0.0	0.0	0.0
Overall Maximum		668	100	82.1	27.6	21.2	62.4	23.8	58.3

^a Small differences may appear between the variable "overall resistance" and "resistance to 1 drug+2 drugs+3drugs", due to rounding.

**Not included in analysis or median calculations

Annex 4: Prevalence (%) of resistance to specific drugs among previously treated TB cases, by country/ geographical setting and WHO region (1999-2002)

COUNTRY/SETTING	Year	No. of PATIENTS TESTED	INH		RMP		EMB		SM	
			MONO	ANY	MONO	ANY	MONO	ANY	MONO	ANY
Africa										
Botswana	2002	66	0.0	18.2	0.0	16.7	4.5	10.6	4.5	18.2
The Gambia	1999	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
South Africa - Eastern Cape	2001	283	3.2	13.4	0.4	7.8	0.0	1.4	3.9	8.8
South Africa - Free State	2001	174	4.0	6.9	1.1	2.9	0.0	0.6	1.1	2.9
South Africa - Gauteng	2001	165	0.6	9.7	0.0	6.1	0.0	4.8	2.4	7.9
South Africa - Kwazulu-Natal	2001	207	4.3	14.5	1.0	8.7	0.5	2.4	2.4	10.6
South Africa - Limpopo	2001	88	4.5	12.5	3.4	10.2	0.0	2.3	1.1	3.4
South Africa - North West	2001	188	0.5	11.2	2.7	9.6	0.0	1.1	5.3	12.2
South Africa - Western Cape	2001	228	2.2	6.6	0.0	3.9	0.0	1.3	1.3	3.5
Zambia	2000	44	4.5	6.8	0.0	2.3	2.3	2.3	4.5	4.5
**South Africa - Mpumalanga	2001	175	2.3	18.9	2.3	16.0	0.0	9.1	2.3	14.3
Median		168.5	2.8	10.1	0.2	7.0	0.0	1.9	2.4	6.3
Americas										
Argentina	1999	149	4.0	16.1	0.0	10.1	0.7	6.7	5.4	16.1
Canada	2000	119	6.7	12.6	0.8	4.2	0.0	3.4	3.4	6.7
Cuba	2000	38	0.0	7.9	0.0	2.6	0.0	2.6	7.9	15.8
Ecuador	2002	133	3.8	33.8	9.8	35.3	0.0	5.3	3.0	18.8
El Salvador	2001	100	3.0	12.0	5.0	13.0	1.0	3.0	3.0	9.0
Honduras	2002	29	6.9	17.2	6.9	17.2	0.0	3.4	13.8	27.6
Puerto Rico	2000	4	0.0	25.0	0.0	25.0	0.0	25.0	0.0	25.0
United States of America	2001	537	6.5	14.0	1.1	6.5	0.2	3.5	3.2	8.6
Venezuela	1998	104	5.8	23.1	2.9	18.3	0.0	7.7	2.9	15.4
**Chile	2001	291	5.2	21.6	2.6	9.5	0.0	4.3	5.1	22.5
Median		104	4.5	16.4	1.1	13.0	0.0	3.5	3.2	15.8
Eastern Mediterranean										
Egypt	2002	217	2.8	46.5	6.9	50.7	0.9	30.9	7.8	53.9
Oman	2001	12	0.0	58.3	0.0	58.3	0.0	25.0	0.0	58.3
Median		114.5	1.4	52.4	3.5	54.5	0.5	27.9	3.9	56.1

**Not included in analysis or median calculations

COUNTRY/SETTING	Year	No. of PATIENTS TESTED	INH		RMP		EMB		SM				
			MONO	ANY	MONO	ANY	MONO	ANY	MONO	ANY			
Europe													
Austria	2000	67	1.5	3.0	0.0	1.5	0.0	0.0	0.0	6.0	7.5		
Belgium	2000	78	6.4	12.8	1.3	6.4	0.0	0.0	5.1	-	-		
Bosnia and Herzegovina	2000	153	1.3	3.3	2.6	5.9	3.3	6.5	1.3	5.2	5.2		
Croatia	2000	99	3.0	4.0	2.0	3.0	0.0	0.0	1.0	0.0	1.0		
Czech Republic	2000	22	0.0	9.1	4.5	13.6	0.0	4.5	0.0	0.0	4.6		
Denmark	2000	33	0.0	24.2	0.0	3.0	0.0	0.0	3.0	3.0	24.2		
Estonia	2000	117	6.8	54.7	0.0	45.3	0.0	41.9	3.4	48.7	48.7		
Finland	2000	29	10.3	13.8	0.0	3.4	0.0	0.0	0.0	0.0	0.0		
France	2000	82	4.9	18.3	1.2	11.0	1.2	2.4	0.0	6.1	15.9		
Germany	2000	236	4.2	15.7	0.0	6.4	0.0	4.7	2.1	12.3	12.3		
Iceland	2000	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Ireland	2000	26	0.0	3.8	0.0	3.8	0.0	0.0	0.0	3.8	3.8		
Israel	2000	24	12.5	37.5	0.0	20.8	0.0	8.3	4.2	29.2	29.2		
Italy	2000	108	5.6	36.1	5.6	29.6	0.9	11.1	4.6	23.1	23.1		
Kazakhstan	2001	319	0.9	67.7	0.3	61.4	1.3	54.2	5.6	77.1	77.1		
Latvia	2000	247	3.6	35.2	0.0	27.1	0.0	15.0	2.8	32.8	32.8		
Lithuania	2002	321	6.2	65.4	0.0	53.3	0.0	38.0	2.5	58.6	58.6		
Luxembourg	2000	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Malta	2000	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Netherlands	2000	95	4.2	9.8	0.0	1.1	0.0	2.1	0.0	4.2	4.2		
Norway	2000	10	.00	0.0	0.0	0.0	0.0	0.0	0.0	10.0	10.0		
Poland	2001	668	3.4	14.4	0.4	9.0	0.0	3.3	1.8	10.0	10.0		
Russian Federation - Orel Oblast	2002	210	4.8	71.0	0.0	42.4	0.5	43.8	1.9	66.2	66.2		
Russian Federation - Tomsk Oblast	2002	117	0.0	51.3	1.7	47.9	0.0	13.7	5.1	57.3	57.3		
Serbia and Montenegro-Belgrade	2000	30	6.7	10.0	0.0	0.0	6.7	6.7	0.0	3.3	3.3		
Slovakia	2000	110	7.3	10.9	0.0	1.8	0.0	0.9	2.7	5.5	5.5		
Slovenia	2000	38	5.3	7.9	0.0	0.0	0.0	2.6	2.6	5.3	5.3		
Spain-Barcelona	2001	32	9.4	28.1	0.0	12.5	0.0	9.4	3.1	18.8	18.8		
Spain-Galicia	2001	40	5.0	17.5	0.0	7.5	0.0	7.5	5.0	17.5	17.5		
Sweden	2000	42	2.4	4.8	0.0	2.4	0.0	0.0	2.4	2.4	2.4		
Switzerland	2000	57	1.8	3.5	1.8	3.5	0.0	0.0	-	-	-		
Turkmenistan - Dashoguz	2001	98	9.2	48.0	1.0	19.4	0.0	15.3	13.3	51.0	51.0		
United Kingdom - England, Wales, Northern Ireland	2000	237	3.8	10.5	1.3	5.5	0.0	2.1	-	-	-		
Uzbekistan - Karakalpakstan	2001	107	7.5	69.2	0.0	40.2	0.0	34.6	10.3	71.0	71.0		
Median		78	4.0	13.3	0.0	6.1	0.0	3.9	2.8	2.8	2.8		

COUNTRY/SETTING	Year	No. of PATIENTS TESTED	INH		RMP		EMB		SM	
			MONO	ANY	MONO	ANY	MONO	ANY	MONO	ANY
South-East Asia										
Nepal	2001	171	5.3	33.3	0.0	20.5	0.0	9.9	7.6	31.0
Thailand	2001	172	4.1	30.8	1.7	22.7	0.6	15.1	5.2	24.4
Median		171.5	4.7	32.1	0.9	21.6	0.3	12.5	6.4	27.7
Western Pacific										
Cambodia	2001	96	9.4	16.7	0.0	3.1	0.0	0.0	1.0	7.3
China - Henan	2001	265	4.2	47.2	3.0	42.6	1.5	18.1	5.7	43.0
China - Hong Kong SAR	2001	169	4.7	18.9	0.0	11.2	0.0	5.9	4.1	17.8
China - Hubei	1999	238	5.5	33.2	1.7	26.9	0.0	8.8	6.3	25.6
China - Liaoning	1999	86	2.3	41.9	3.5	29.1	0.0	14.0	9.3	41.9
Japan	1997	264	6.8	33.0	0.8	21.6	0.0	15.2	7.6	24.2
New Zealand	2001	22	0.0	4.5	0.0	0.0	0.0	0.0	4.5	9.1
Singapore	2001	126	4.0	6.3	1.6	2.4	0.0	0.8	4.0	5.6
Median		147.5	4.4	25.9	1.2	16.4	0.0	7.4	5.1	21.0
Overall Median		100	4.0	14.4	0.0	8.7	0.0	3.5	3.2	11.4
Overall Minimum		1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Overall Maximum		668	12.5	71.0	9.8	61.4	6.7	54.2	13.8	77.1

**Not included in analysis or median calculations

Annex 5: Prevalence (%) of resistance to specific drugs among previously treated TB cases, by country/ geographical setting and WHO region (1999-2002)

COUNTRY/SETTING	Year	No. of PATIENTS TESTED	OVERALL		RESISTANCE ^a TO:				Poly- resistance	MDR
			Susceptible	Resistant	1 Drug	2 Drugs	3+Drugs			
Africa										
Botswana	2002	*	84.5	15.5	9.0	4.5	2.1	3.9	2.7	
The Gambia	1999	*	95.9	4.1	3.7	0.5	0.0	0.0	0.5	
Democratic Republic of Congo - Kinshasa	1999	710	61.0	39.0	18.5	11.7	8.9	14.8	5.8	
South Africa - Eastern Cape	2002	*	86.6	13.4	7.7	4.3	1.3	2.5	3.1	
South Africa - Free State	2001	*	91.3	8.7	5.7	1.7	1.3	1.3	1.8	
South Africa - Gauteng	2001	*	92.4	7.6	3.9	2.2	1.5	1.7	2.0	
South Africa - Kwazulu-Natal	2001	*	90.3	8.7	4.5	1.6	2.6	1.4	2.8	
South Africa - Limpopo	2001	*	91.0	9.0	4.1	2.8	2.1	1.7	3.3	
South Africa - North West	2001	*	89.1	9.9	5.1	2.7	2.0	1.8	3.0	
South Africa - Western Cape	2001	*	93.6	6.4	3.2	2.3	0.9	1.2	1.9	
Zambia	2000	*	88.1	11.9	9.1	2.0	0.8	1.0	1.8	
**South Africa-Mpumalanga	2001	*	88.8	11.2	5.7	2.5	2.9	1.5	4.0	
Median			91.0	9.0	5.1	2.3	1.4	1.7	2.7	
Americas										
Argentina	1999	*	87.6	12.4	8.0	1.6	2.8	1.3	3.1	
Canada	2000	1363	90.8	9.2	6.3	1.9	1.0	1.9	1.0	
Cuba	2000	*	93.9	6.1	4.1	1.7	0.2	1.5	0.5	
Ecuador	2002	*	73.8	26.2	13.4	9.6	3.3	4.1	8.7	
El Salvador	2001	*	93.0	7.0	5.5	1.2	0.3	0.7	1.8	
Honduras	2002	*	82.0	18.0	11.8	4.8	1.4	4.2	2.0	
Puerto Rico	2000	139	91.4	8.6	7.2	0.7	0.7	0.7	0.7	
United States	2001	10288	87.0	13.0	8.9	2.8	1.2	2.7	1.4	
Venezuela	1998	*	90.4	9.6	5.5	2.7	1.4	2.4	1.7	
**Chile	2001	*	86.3	13.7	9.4	2.9	1.4	2.9	1.4	
Median			90.4	9.6	7.2	1.9	1.2	1.9	1.4	
Eastern Mediterranean										
Egypt	2002	*	63.9	36.1	21.2	7.2	7.8	7.4	7.5	
Oman	2001	183	91.3	8.7	4.4	0.5	3.8	0.5	3.8	
Median			77.5	24.4	12.8	3.9	5.8	3.9	5.8	

COUNTRY/SETTING	Year	No. of PATIENTS TESTED	OVERALL		RESISTANCE ^a TO:				Poly-resistance	MDR
			Susceptible	Resistant	1 Drug	2 Drugs	3+Drugs			
Europe										
Andorra	2000	3	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Austria	2000	761	95.1	4.9	3.4	0.9	0.5	0.9	0.5	0.5
Belgium	2000	730	92.9	7.1	4.9	1.5	0.7	0.7	1.5	1.5
Bosnia and Herzegovina	2000	1153	96.0	4.0	2.9	0.7	0.3	0.6	0.4	0.4
Croatia	2000	879	97.7	2.3	1.9	0.2	0.1	0.1	0.1	0.2
Czech Republic	2000	584	95.3	5.0	2.7	1.4	0.9	0.7	1.5	1.5
Denmark	2000	425	86.8	13.2	6.8	5.9	0.5	5.9	0.5	0.5
Estonia	2000	527	64.9	35.1	10.6	4.4	20.1	4.9	19.5	19.5
Finland	2000	437	95.0	5.0	3.7	1.1	0.2	0.9	0.5	0.5
France	2000	1191	89.1	10.9	8.1	2.1	0.8	1.6	1.3	1.3
Germany	2000	2486	91.3	8.7	4.9	2.3	2.3	2.2	1.6	1.6
Iceland	2000	9	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ireland	2000	216	96.8	3.2	1.9	1.4	0.0	0.0	1.4	1.4
Israel	2000	281	68.0	32.0	12.5	4.6	14.9	5.0	14.6	14.6
Italy	2000	*	85.3	14.7	7.9	4.4	2.4	3.5	3.3	3.3
Kazakhstan	2001	*	36.7	63.3	12.5	16.3	34.5	26.1	24.7	24.7
Latvia	2000	1144	67.0	33.0	8.7	10.8	13.6	11.3	13.1	13.1
Lithuania	2002	1140	59.9	40.1	9.9	8.4	27.6	9.3	27.8	27.8
Luxembourg	2000	44	93.2	6.8	6.8	0.0	0.0	0.0	0.0	0.0
Malta	2000	10	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands	2000	842	89.4	10.6	7.8	2.1	0.6	2.3	0.5	0.5
Norway	2000	170	76.5	23.5	14.7	8.8	0.0	7.1	1.8	1.8
Poland	2001	3705	92.0	8.0	4.3	1.8	1.9	1.2	2.5	2.5
Russian Federation - Orel Oblast	2002	589	60.3	39.7	5.9	11.0	22.8	17.0	16.8	16.8
Russian Federation - Tomsk Oblast	2002	650	58.5	41.5	9.8	13.1	18.6	12.6	19.1	19.1
Serbia and Montenegro-Belgrade	2000	279	93.2	6.8	5.7	0.7	0.4	0.7	0.4	0.4
Slovakia	2000	575	94.1	5.9	3.8	1.6	0.5	0.9	1.2	1.2
Slovenia	2000	320	96.6	3.4	2.5	0.6	0.3	0.9	0.0	0.0
Spain - Barcelona	2001	*	87.1	12.9	8.1	2.1	1.8	2.7	2.1	2.1
Spain - Galicia	2001	*	87.3	12.7	9.8	0.8	2.4	1.0	2.0	2.0
Sweden	2000	365	89.3	10.7	7.4	2.7	0.5	1.9	1.4	1.4
Switzerland	2000	492	94.9	5.1	4.7	0.4	0.0	0.0	0.4	0.4
Turkmenistan - Dashoguz	2001	*	52.5	47.5	22.3	9.9	15.3	13.6	11.6	11.6
United Kingdom - England, Wales, Northern Ireland	2000	3004	91.0	9.0	6.5	1.4	1.0	1.2	1.2	1.2

*Combined estimates were calculated through a direct standardization method

**Not included in analysis or median calculations

COUNTRY/SETTING	Year	No. of PATIENTS TESTED	OVERALL		RESISTANCE ^a TO:			Poly-resistance	MDR
			Susceptible	Resistant	1 Drug	2 Drugs	3+Drugs		
United Kingdom - Scotland	2000	302	96.0	4.0	4.0	0.0	0.0	0.0	
Uzbekistan - Karakalpakstan	2001	*	36.1	63.9	16.4	15.5	31.9	26.8	
Median			91.2	8.8	6.2	1.7	0.6	1.3	
South-East Asia									
Nepal	2001	*	84.3	15.7	7.9	4.2	3.5	3.4	4.3
Thailand	2001	*	82.7	17.3	10.6	4.1	2.6	3.8	2.9
Median			83.5	16.5	9.3	4.2	3.1	3.6	3.6
Western Pacific									
Australia	2000	766	89.7	10.3	7.7	2.1	0.5	1.6	1.0
Cambodia	2001	*	89.3	10.7	8.6	2.1	0.1	2.0	0.2
China - Hubei	1999	*	75.8	24.2	11.6	7.9	4.7	5.6	7.0
China - Liaoning	1999	*	56.4	44.6	21.4	12.5	11.6	11.2	13.0
China - Henan	2001	*	67.7	32.3	15.5	7.9	8.9	6.7	10.1
China - Hong Kong SAR	2001	3639	89.2	10.8	7.1	2.5	1.3	2.5	1.3
Japan	1997	*	87.9	12.1	7.0	2.6	2.5	2.7	2.0
New Zealand	2001	294	88.8	11.2	8.8	2.4	0.0	2.4	0.0
Singapore	2001	949	94.1	5.9	4.0	1.3	0.6	1.4	0.5
Median			88.8	11.1	8.8	2.7	1.3	2.4	1.6
Overall Median		NA	89.6	10.4	6.9	2.3	1.3	1.8	1.7
Overall Minimum		NA	31.1	0.0	0.0	0.0	0.0	0.0	0.0
Overall Maximum		NA	100.0	63.9	22.4	15.5	42.8	23.6	26.8

^aCombined estimates were calculated through a direct standardization method

**Not included in analysis or median calculations

Annex 6: Prevalence (%) of resistance to specific drugs among combined TB cases, by country/geographical setting and WHO region (1999-2002)

COUNTRY/SETTING	Year	No. of PATIENTS TESTED	INH		RMP		EMB		SM	
			MONO	ANY	MONO	ANY	MONO	ANY	MONO	ANY
Africa										
Botswana	2002	*	1.7	6.6	1.1	4.7	0.9	2.7	5.2	10.2
The Gambia	1999	*	1.8	2.3	0.5	0.9	0.0	0.0	1.4	1.4
Democratic Republic of Congo – Kinshasa	1999	710	4.4	23.0	0.1	6.2	5.1	15.4	8.9	28.2
South Africa - Eastern Cape	2001	*	3.6	9.2	0.2	3.4	0.0	0.9	3.9	7.4
South Africa - Free State	2001	*	3.5	6.5	0.8	2.5	0.0	0.6	1.5	3.7
South Africa - Gauteng	2001	*	1.7	5.3	0.3	2.4	0.0	1.1	2.0	4.5
South Africa - Kwazulu-Natal	2001	*	2.9	7.0	0.3	3.1	0.1	1.1	1.3	5.1
South Africa - Limpopo	2001	*	1.9	6.9	0.6	3.9	0.0	2.2	1.5	3.9
South Africa - North West	2001	*	1.9	6.8	1.8	3.8	0.0	1.2	2.3	5.7
South Africa - Western Cape	2001	*	2.4	5.6	0.0	1.9	0.0	0.4	0.7	2.7
Zambia	2000	*	3.5	6.3	0.0	1.8	0.8	2.0	4.5	5.3
**South Africa - Mpumalanga	2001	*	3.0	8.5	0.8	4.8	0.0	2.0	1.9	5.4
Median			2.4	6.6	0.5	3.4	0.0	1.2	2.0	5.3
Americas										
Argentina	1999	*	1.8	6.0	0.1	3.4	1.0	3.1	5.1	8.9
Canada	2000	1363	4.5	7.3	0.1	1.2	0.2	1.2	1.5	3.7
Cuba	2000	*	0.2	1.7	0.0	1.0	0.0	0.2	3.9	5.5
Ecuador	2002	*	4.7	16.3	3.2	13.1	0.2	1.3	5.3	11.8
El Salvador	2001	*	0.7	2.1	1.1	2.1	0.4	0.5	3.3	4.2
Honduras	2002	*	1.4	6.9	1.2	2.9	0.0	1.3	10.2	15.2
Puerto Rico	2000	139	2.9	4.3	0.7	1.4	0.7	1.4	2.9	4.3
United States	2001	10288	4.1	8.0	0.3	1.7	0.4	1.7	4.1	7.4
Venezuela	1998	*	2.1	5.6	0.6	2.6	0.1	1.6	2.7	5.6
**Chile	2001	*	2.1	7.5	0.5	2.2	0.0	0.9	6.8	11.9
Median			2.0	6.5	0.2	2.4	0.2	1.3	4.0	6.5
Eastern Mediterranean										
Egypt	2002	*	2.7	15.2	4.0	13.4	0.5	7.0	14.0	28.1
Oman	2001	183	3.3	7.7	0.5	4.4	0.0	1.6	0.5	4.9
Median			3.0	11.6	2.3	8.9	0.3	4.3	7.3	16.5

*Combined estimates were calculated through a direct standardization method

**Not included in analysis or median calculations

COUNTRY/SETTING	Year	No. of PATIENTS TESTED	INH		RMP		EMB		SM	
			MONO	ANY	MONO	ANY	MONO	ANY	MONO	ANY
Europe										
Andorra	2000	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Austria	2000	761	1.4	2.9	0.3	0.8	0.1	0.1	1.6	3.0
Belgium	2000	730	4.2	6.4	0.4	1.9	0.3	1.6	-	-
Bosnia and Herzegovina	2000	1153	0.4	1.0	0.9	1.5	1.2	1.8	0.4	1.3
Croatia	2000	879	1.0	1.4	0.2	0.5	0.0	0.1	0.7	0.9
Czech Republic	2000	584	1.5	3.8	0.2	1.7	0.2	1.0	0.9	2.2
Denmark	2000	425	2.6	8.7	0.0	0.7	0.0	0.9	4.2	9.9
Estonia	2000	527	5.5	30.0	0.0	19.5	0.0	19.5	5.1	28.3
Finland	2000	437	2.1	3.4	0.5	0.9	0.0	0.2	1.1	2.1
France	2000	1191	1.0	3.8	0.2	1.5	0.8	1.9	6.0	7.4
Germany	2000	2486	2.3	6.1	0.2	1.8	0.2	1.4	2.2	5.5
Iceland	2000	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ireland	2000	216	1.4	2.8	0.0	1.4	0.0	0.0	0.5	0.5
Israel	2000	281	6.8	26.3	0.4	14.9	1.4	10.0	3.9	22.4
Italy	2000	*	2.4	9.2	0.9	4.3	0.6	2.4	4.0	9.3
Kazakhstan	2001	*	2.5	58.8	0.3	27.0	0.9	32.1	8.7	57.9
Latvia	2000	1144	5.9	30.3	0.0	13.1	0.2	8.1	2.5	26.2
Lithuania	2002	1140	6.5	36.7	0.3	22.0	0.0	16.0	3.2	32.1
Luxembourg	2000	44	4.5	4.5	0.0	0.0	0.0	0.0	2.3	2.3
Malta	2000	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands	2000	842	3.1	5.8	0.1	0.6	0.1	0.8	4.5	6.9
Norway	2000	170	4.1	12.4	0.0	2.4	4.7	6.5	5.9	11.2
Poland	2001	3705	2.3	6.0	0.3	2.8	0.0	1.1	1.7	4.6
Russian Federation - Orel Oblast	2002	589	3.1	36.8	0.0	16.8	0.2	18.7	2.7	35.8
Russian Federation - Tomsk Oblast	2002	650	2.0	33.1	0.6	20.3	0.0	6.0	7.2	38.3
Serbia and Montenegro- Belgrade	2000	279	1.8	2.5	1.4	1.8	1.1	1.4	1.4	2.5
Slovakia	2000	575	2.8	4.7	0.2	1.6	0.0	0.3	0.9	2.1
Slovenia	2000	320	1.9	2.8	0.0	0.0	0.0	0.3	0.6	1.6
Spain - Barcelona	2001	*	4.4	8.5	0.0	2.8	0.0	1.1	3.7	8.1
Spain - Galicia	2001	*	2.8	5.8	0.0	2.0	0.5	2.8	6.5	8.3
Sweden	2000	365	6.8	10.1	0.0	1.4	0.0	0.5	0.5	2.5
Switzerland	2000	492	4.5	4.9	0.2	0.6	0.0	0.0	-	-
Turkmenistan - Dashoguz	2001	*	7.6	32.8	0.5	12.2	0.0	9.1	14.2	38.9
United Kingdom - Scotland	2000	302	3.6	3.6	0.0	0.0	0.0	0.0	0.3	0.3

COUNTRY/SETTING	Year	No. of PATIENTS TESTED	INH		RMP		EMB		SM	
			MONO	ANY	MONO	ANY	MONO	ANY	MONO	ANY
United Kingdom - England, Wales, Northern Ireland	2000	3004	4.0	6.4	0.4	1.6	0.0	0.6	-	-
Uzbekistan - Karakalpakstan	2001	*	5.6	53.1	0.0	26.8	0.0	24.9	10.8	57.8
Median			2.7	6.0	0.2	1.6	0.0	1.1	2.3	5.0
South-East Asia										
Nepal	2001	*	2.2	9.8	0.2	4.7	0.0	2.3	5.5	12.4
Thailand	2001	*	5.2	11.7	0.5	3.6	0.1	2.6	4.8	9.9
Median			3.7	10.8	0.4	4.2	0.1	2.5	5.2	11.2
Western Pacific										
Australia	2000	766	7.4	10.1	0.3	1.3	0.0	0.9	0.0	1.2
Cambodia	2001	*	5.0	7.0	0.4	0.8	0.0	0.1	3.2	5.1
China - Hubei	1999	*	4.2	15.5	1.3	9.6	0.1	2.6	6.0	14.9
China - Liaoning	1999	*	4.8	28.3	0.1	14.6	0.2	5.7	14.4	35.5
China - Henan	2001	*	3.3	19.4	1.6	12.3	0.9	5.4	9.7	23.8
China - Hong Kong	2001	3639	2.4	6.1	0.2	1.4	0.0	0.8	4.5	8.0
Japan	1997	*	2.3	6.0	0.1	2.6	0.1	1.3	5.6	8.5
New Zealand	2001	294	4.1	6.1	0.0	0.3	0.3	0.7	4.4	6.5
Singapore	2001	949	1.9	3.7	0.2	0.8	0.1	0.7	1.8	3.4
Median			4.1	8.6	0.3	1.7	0.1	0.8	4.5	8.0
Overall Median		NA	2.7	6.6	0.2	2.2	0.1	1.3	3.1	5.8
Overall Minimum		NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Overall Maximum		NA	7.7	58.8	4.4	27.0	5.1	32.1	14.9	57.9

*Combined estimates were calculated through a direct standardization method

**Not included in analysis or median calculations

Annex 7: Trends of resistance (%) against any TB drug among new TB cases in 26 countries/settings (1994–2002)

Country/Setting	Years of observation									P-Value
	1994	1995	1996	1997	1998	1999	2000	2001	2002	
Botswana	.	3.7	.	.	.	6.3	.	.	10.4	<0.0001
Canada	.	.	.	9.8	9.4	9.5	8.5	.	.	ns
China, Hong Kong SAR	.	.	12.2	11.8	12.0	12.8	11.5	10.2	.	0.023
Cuba	.	8.3	.	.	4.6	.	5.0	.	.	0.017
Czech Republic	.	2.0	.	.	.	2.7	4.4	.	.	ns
Denmark	13.1	15.3	12.0	.	.	ns
Estonia	28.2	.	.	.	36.9	33.4	28.5	.	.	ns
Finland	.	.	.	4.9	.	2.2	4.5	.	.	ns
France	.	8.2	.	9.3	.	9.2	9.3	.	.	ns
Germany	.	.	.	5.8	9.0	6.8	6.8	.	.	ns
Lithuania	28.1	27.7	.	29.2	ns
Latvia	.	.	34.0	.	29.9	30.8	31.7	.	.	ns
Nepal	.	.	9.8	.	.	13.3	.	11.0	.	ns
Netherlands	.	.	10.3	.	.	8.8	10.7	.	.	ns
New Zealand	.	5.6	4.4	13.0	12.9	8.3	13.4	11.4	.	0.015
Norway	.	.	10.9	.	.	16.0	24.4	.	.	0.006
Oman	4.5	.	8.7	5.3	.	ns
Puerto Rico	10.0	.	.	11.3	9.5	7.2	8.1	12.0	.	ns
Russian Fed., Tomsk Oblast	29.0	.	35.3	36.8	37.3	0.005
Slovakia	2.7	2.9	4.1	.	.	ns
Slovenia	.	.	.	2.4	.	3.0	2.5	.	.	ns
Spain, Barcelona	.	9.6	.	3.5	.	6.3	8.9	10.5	.	ns
Sweden	.	.	.	7.9	.	11.7	11.2	.	.	ns
Switzerland	.	.	.	3.1	.	6.1	5.5	.	.	ns
United Kingdom - England, Wales, Northern Ireland ^a	.	6.8	.	7.1	.	8.7	8.4	.	.	----
United States	.	12.3	.	12.0	12.3	11.6	12.7	12.7	.	ns

^a Data from England, Wales and Northern Ireland reported before 1999 cannot be compared with data reported after 1999, because of changes in surveillance methodologies.

Annex 8: Trends of MDR (%) among new TB cases in 26 countries/ settings (1994-2002)

Country/Setting	Years of observation									P-Value
	1994	1995	1996	1997	1998	1999	2000	2001	2002	
Botswana	.	0.2	.	.	.	0.5	.	.	0.8	ns
Canada	.	.	.	0.8	0.6	0.6	0.7	.	.	ns
China, Hong Kong SAR	.	.	1.4	1.1	1.3	1.0	1.1	0.8	.	0.01
Cuba	.	0.7	.	.	0.0	.	0.3	.	.	-
Czech Republic	.	1.0	.	.	.	0.3	1.1	.	.	ns
Denmark	0.5	0.0	0.3	.	.	-
Estonia	10.2	.	.	.	14.1	17.5	12.2	.	.	ns
Finland	.	.	.	0.0	.	0.0	0.3	.	.	-
France	.	0.5	.	0.0	.	.	0.8	.	.	-
Germany	.	.	.	0.5	1.0	0.8	0.8	.	.	ns
Latvia	.	.	14.4	.	9.0	10.4	9.3	.	.	0.032
Lithuania	7.8	8.7	.	9.4	ns
Nepal	.	.	1.1	.	.	3.7	.	1.3	.	ns
Netherlands	.	.	0.6	.	.	0.4	0.9	.	.	ns
New Zealand	.	1.4	0.0	0.8	1.3	0.9	0.4	0.0	.	-
Norway	.	.	2.2	.	.	2.1	1.9	.	.	ns
Oman	0.8	.	3.5	0.0	.	-
Puerto Rico	1.9	.	.	2.5	1.6	0.0	0.0	2.0	.	-
Russian Fed., Tomsk Oblast	6.5	.	8.6	10.7	13.7	0.0001
Spain, Barcelona	.	0.5	.	0.3	.	0.0	2.2	0.8	.	-
Slovakia	0.3	0.7	1.1	.	.	ns
Slovenia	.	.	.	0.7	.	0.0	0.0	.	.	-
Sweden	.	.	.	0.6	.	0.8	1.2	.	.	ns
Switzerland	.	.	.	0.0	.	0.7	0.0	.	.	-
United Kingdom - England, Wales, Northern Ireland ^a	.	1.1	.	0.8	.	0.5	0.9	.	.	---
United States	.	1.6	.	1.2	1.1	1.1	1.2	1.1	.	0.0002

^a Data from England, Wales and Northern Ireland reported before 1999 cannot be compared with data reported after 1999, because of changes in surveillance methodologies.

Annex 9: Trends of any INH resistance (%) among new TB cases in 26 countries/settings (1994-2002)

Country/Setting	Years of observation									P-Value
	1994	1995	1996	1997	1998	1999	2000	2001	2002	
Botswana	.	1.5	.	.	.	4.4	.	.	4.5	0.012
Canada	.	.	.	7.2	7.2	7.7	6.8	.	.	ns
China, Hong Kong SAR	.	.	6.1	5.8	6.9	5.9	6.2	5.5	.	ns
Cuba	.	2.0	.	.	0.7	.	1.1	.	.	ns
Czech Republic	.	2.0	.	.	.	1.6	3.4	.	.	ns
Denmark	6.1	7.4	7.4	.	.	ns
Estonia	21.1	.	.	.	26.0	27.3	22.9	.	.	ns
Finland	.	.	.	4.6	.	0.5	2.7	.	.	0.02
France	.	3.4	.	3.6	.	3.4	2.5	.	.	ns
Germany	.	.	.	4.0	5.5	4.2	3.9	.	.	ns
Latvia	.	.	31.7	.	28.1	27.8	29.0	.	.	ns
Lithuania	21.7	21.8	.	25.4	ns
Nepal	.	.	5.6	.	.	7.6	.	5.4	.	ns
Netherlands	.	.	6.2	.	.	5.8	5.6	.	.	ns
New Zealand	.	4.2	4.4	10.6	11.6	5.7	8.7	6.3	.	ns
Norway	.	.	8.0	.	.	7.6	13.1	.	.	ns
Oman	3.0	.	5.8	4.1	.	ns
Puerto Rico	6.8	.	.	6.9	8.7	1.2	3.7	8.0	.	ns
Russian Fed., Tomsk Oblast	19.4	.	24.4	28.2	29.1	0.0002
Slovakia	2.0	1.8	3.2	.	.	ns
Slovenia	.	.	.	1.0	.	2.3	2.1	.	.	ns
Spain, Barcelona	.	3.2	.	2.2	.	3.9	5.9	.	.	ns
Sweden	.	.	.	5.6	.	9.3	10.9	.	.	0.02
Switzerland	.	.	.	2.8	.	5.6	5.5	.	.	ns
United Kingdom - England, Wales, Northern Ireland ^a	.	5.5	.	5.0	.	6.2	6.0	.	.	---
United States	.	7.8	.	8.0	8.3	7.6	8.1	7.7	.	ns

^a Data from England, Wales and Northern Ireland reported before 1999 cannot be compared with data reported after 1999, because of changes in surveillance methodologies.

Annex 10: Trends of any rifampicin resistance (%) among new TB cases in 26 countries/settings (1994-2002)

Country/Setting	Years of observation										P-Value
	1994	1995	1996	1997	1998	1999	2000	2001	2002		
Botswana	.	1.0	.	.	.	0.6	.	.	.	2.0	ns
Canada	.	.	.	0.9	0.6	0.8	0.8	.	.	.	ns
China, Hong Kong SAR	.	.	1.6	1.4	1.4	1.3	1.2	1.0	.	.	0.01
Cuba	.	0.9	.	.	0.0	.	0.8	.	.	.	-
Czech Republic	.	1.0	.	.	.	0.8	1.1	.	.	.	ns
Denmark	0.5	0.3	0.5	.	.	.	ns
Estonia	10.2	.	.	.	14.3	17.8	12.2	.	.	.	ns
Finland	.	.	.	0.0	.	0.0	0.8	.	.	.	-
France	.	0.7	.	0.3	.	0.8	0.8	.	.	.	ns
Germany	.	.	.	0.8	1.7	1.1	1.0	.	.	.	ns
Latvia	.	.	14.7	.	9.0	10.4	9.3	.	.	.	0.02
Lithuania	10.1	9.6	.	9.8	.	ns
Nepal	.	.	1.7	.	.	3.7	.	1.7	.	.	ns
Netherlands	.	.	1.1	.	.	0.8	0.9	.	.	.	ns
New Zealand	.	1.4	0.0	0.8	1.3	1.3	0.4	0.4	.	.	-
Norway	.	.	2.2	.	.	2.1	2.5	.	.	.	ns
Oman	1.5	.	3.5	0.6	.	.	ns
Puerto Rico	2.7	.	.	3.1	1.6	0.6	0.7	3.0	.	.	ns
Russian Fed., Tomsk Oblast	7.9	.	10.3	11.8	14.3	.	0.001
Slovakia	0.3	1.1	1.5	.	.	.	0.04
Slovenia	.	.	.	0.7	.	0.0	0.0	.	.	.	-
Spain, Barcelona	.	0.9	.	0.3	.	0.8	2.2	1.5	.	.	ns
Sweden	.	.	.	0.6	.	1.3	1.2	.	.	.	ns
Switzerland	.	.	.	0.0	.	0.9	0.0	.	.	.	-
United Kingdom - England, Wales, Northern Ireland ^a	.	1.2	.	0.8	.	0.5	1.2	.	.	.	---
United States	.	2.4	.	1.7	1.5	1.3	1.5	1.5	.	.	0.0001

^a Data from England, Wales and Northern Ireland reported before 1999 cannot be compared with data reported after 1999, because of changes in surveillance methodologies.

Annex 11: Trends of resistance (%) to any TB drug among previously treated TB cases in 24 countries/settings (1994-2002)

Country/Setting	Years of observation									P-Value
	1994	1995	1996	1997	1998	1999	2000	2001	2002	
Botswana	.	14.9	.	.	.	22.8	.	.	21.7	ns
Canada	.	.	.	16.0	11.1	13.7	16.8	.	.	ns
China, Hong Kong SAR	.	.	26.9	27.1	25.6	26.4	23.7	23.1	.	ns
Cuba	.	91.3	.	.	32.6	.	15.8	.	.	0.0001
Czech Republic	.	12.5	.	.	.	8.6	13.6	.	.	ns
Denmark	12.5	16.7	27.3	.	.	ns
Estonia	46.2	.	.	.	59.8	55.1	58.1	.	.	ns
Finland	.	.	.	0.0	.	3.7	13.8	.	.	-
France	.	21.5	.	20.0	.	16.0	28.0	.	.	ns
Germany	.	.	.	21.0	19.8	19.8	18.2	.	.	ns
Latvia	.	.	73.7	.	30.8	33.7	38.1	.	.	<0.0001
Lithuania	61.7	61.8	.	67.9	ns
Netherlands	.	.	15.7	.	.	9.5	8.4	.	.	ns
New Zealand	.	0.0	6.7	21.4	27.3	17.4	29.4	9.1	.	-
Norway	.	.	16.7	.	.	2.5	10.0	.	.	ns
Puerto Rico	27.3	.	.	58.3	7.1	14.3	25.0	.	.	ns
Russian Fed. Tomsk Oblast	57.8	.	62.0	67.6	60.7	ns
Slovakia	15.9	6.6	13.6	.	.	ns
Slovenia	.	.	.	8.3	.	5.7	10.5	.	.	ns
Spain-Barcelona	.	29.5	.	23.2	.	34.1	22.2	31.3	.	ns
Sweden	.	.	.	16.7	.	25.8	7.1	.	.	ns
Switzerland	.	.	.	27.5	.	21.1	5.3	.	.	0.006
United Kingdom - England, Wales, Northern Ireland ^a	.	32.4	.	22.2	.	5.9	15.2	.	.	---
United States	.	23.6	.	20.9	17.0	17.7	18.2	18.8	.	<0.0001

^a Data from England, Wales and Northern Ireland reported before 1999 cannot be compared with data reported after 1999, because of changes in surveillance methodologies.

Annex 12: MDR trends among previously treated TB cases in 24 countries/settings (1994-2002)

Country/Setting	Years of observation									P-Value
	1994	1995	1996	1997	1998	1999	2000	2001	2002	
Botswana	.	6.1	.	.	.	9.0	.	.	10.4	ns
Canada	.	.	.	3.2	3.7	3.2	3.4	.	.	ns
China, Hong Kong SAR	.	.	9.6	7.6	11.3	7.7	9.2	11.2	.	ns
Cuba	.	13.0	.	.	7.0	.	2.6	.	.	ns
Czech Republic	.	6.3	.	.	.	2.9	9.1	.	.	ns
Denmark	3.1	0.0	3.0	.	.	-
Estonia	19.2	.	.	.	37.8	48.3	45.3	.	.	<0.0001
Finland	.	.	.	0.0	.	0.0	3.4	.	.	-
France	.	4.1	.	3.1	.	8.5	8.5	.	.	ns
Germany	.	.	.	9.6	7.2	6.9	5.9	.	.	ns
Latvia	.	.	54.4	.	23.7	26.8	27.1	.	.	<0.0001
Lithuania	42.5	43.2	.	53.3	0.007
Netherlands	.	.	0.6	.	.	0.0	1.1	.	.	-
New Zealand	.	0.0	0.0	0.0	9.1	0.0	0.0	0.0	.	-
Norway	.	.	16.7	.	.	0.0	0.0	.	.	ns
Puerto Rico	13.6	.	.	16.7	0.0	14.3	25.0	.	.	-
Russian Fed. Tomsk Oblast	26.7	.	32.2	42.4	43.6	0.0002
Slovakia	8.3	2.5	1.8	.	.	0.009
Slovenia	.	.	.	2.8	.	5.7	0.0	.	.	-
Spain-Barcelona	.	20.5	.	11.6	.	20.5	11.1	12.5	.	ns
Sweden	.	.	.	8.3	.	12.9	2.4	.	.	ns
Switzerland	.	.	.	12.5	.	10.5	1.8	.	.	ns
United Kingdom - England, Wales, Northern Ireland ^a	.	16.9	.	13.2	.	2.7	4.2	.	.	---
United States	.	7.1	.	5.6	3.4	4.0	3.9	5.2	.	0.01

^a Data from England, Wales and Northern Ireland reported before 1999 cannot be compared with data reported after 1999, because of changes in surveillance methodologies.

Annex 13: Trends of RMP resistance among previously treated TB cases in 24 countries/settings (1994-2002)

Country/Setting	Years of observation									P-Value
	1994	1995	1996	1997	1998	1999	2000	2001	2002	
Botswana	.	7.9	.	.	.	13.1	.	.	12.3	ns
Canada	.	.	.	3.2	3.7	3.2	4.2	.	.	ns
China, Hong Kong SAR	.	.	11.6	9.2	12.8	7.7	9.2	11.2	.	ns
Cuba	.	17.4	.	.	7.0	.	2.6	.	.	0.03
Czech Republic	.	6.3	.	.	.	4.3	2.6	.	.	ns
Denmark	3.1	0.0	3.0	.	.	ns
Estonia	19.2	.	.	.	39.0	48.3	45.3	.	.	0.01
Finland	.	.	.	0.0	.	0.0	3.4	.	.	ns
France	.	6.7	.	6.2	.	9.4	11.0	.	.	ns
Germany	.	.	.	10.3	7.2	8.9	6.4	.	.	ns
Latvia	.	.	57.9	.	25.0	27.9	27.1	.	.	0.0003
Lithuania	46.1	45.0	.	53.3	ns
Netherlands	.	.	0.6	.	.	2.4	1.1	.	.	ns
New Zealand	.	0.0	0.0	14.3	9.1	0.0	0.0	0.0	.	ns
Norway	.	.	16.7	.	.	0.0	0.0	.	.	ns
Puerto Rico	18.2	.	.	25.0	0.0	14.3	25.0	.	.	ns
Russian Fed. Tomsk Oblast	31.0	.	38.0	46.0	47.9	0.0004
Slovakia	10.2	4.1	1.8	.	.	0.003
Slovenia	.	.	.	2.8	.	5.7	0.0	.	.	ns
Spain-Barcelona	.	20.5	.	11.6	.	22.7	11.1	12.5	.	ns
Sweden	.	.	.	8.3	.	12.9	2.4	.	.	ns
Switzerland	.	.	.	15.0	.	10.5	3.5	.	.	ns
United Kingdom - England, Wales, Northern Ireland ^a	.	17.6	.	13.2	.	3.6	5.5	.	.	---
United States	.	8.4	.	8.0	3.6	5.3	4.8	6.5	.	0.007

^a Data from England, Wales and Northern Ireland reported before 1999 cannot be compared with data reported after 1999, because of changes in surveillance methodologies.

Annex 14: Trends of resistance (%) to any TB drug among combined cases in 26 countries/settings (1994-2002)

Country/Setting	Years of observation									P-Value
	1994	1995	1996	1997	1998	1999	2000	2001	2002	
Australia	.	9.5	10.5	.	13.0	10.7	10.3	.	.	ns
Botswana	.	4.8	.	.	.	7.7	.	.	15.5	S
Canada	.	.	.	10.4	9.5	9.8	9.2	.	.	ns
China-Hong Kong SAR	.	.	14.4	13.1	12.9	13.6	12.2	10.8	.	<0.0001
Cuba	.	10.7	.	.	8.3	.	6.1	.	.	S
Czech Republic	.	2.8	.	.	.	3.3	5.0	.	.	S
Denmark	13.1	15.4	13.2	.	.	ns
Estonia	29.8	.	.	.	41.0	37.1	35.1	.	.	S
Finland	.	.	.	4.9	.	2.0	5.0	.	.	ns
France	.	9.6	.	11.1	.	10.4	10.9	.	.	S
Germany	.	.	.	7.7	9.3	8.3	8.7	.	.	ns
Israel	19.2	16.6	32.0	.	.	0.002
Latvia	.	.	49.7	.	30.1	31.3	33.0	.	.	S
Lithuania	44.5	44.3	.	48.1	0.002
Netherlands	.	14.1	11.0	.	.	8.8	10.6	.	.	0.002
New Zealand	.	5.3	4.6	13.9	13.9	9.2	14.5	11.2	.	0.01
Norway	.	.	11.1	13.0	23.5	0.01
Puerto Rico	11.0	.	.	14.5	9.3	7.5	8.6	.	.	ns
Russian Fed. -Toms Oblast	39.3	.	40.0	43.2	41.5	ns
Slovakia	5.5	3.6	5.9	.	.	ns
Slovenia	.	.	.	3.1	.	3.2	3.4	.	.	ns
Spain-Barcelona	.	12.9	.	5.4	.	9.4	10.2	12.9	.	S
Sweden	.	.	.	8.4	.	12.7	10.7	.	.	ns
Switzerland	.	.	.	5.8	.	7.0	5.1	.	.	ns
United Kingdom - England, Wales, Northern Ireland ^a	.	8.2	.	8.1	.	8.4	9.0	.	.	---
United States	.	12.9	.	12.4	12.5	11.9	12.9	13.0	.	ns

^a Data from England, Wales and Northern Ireland reported before 1999 cannot be compared with data reported after 1999, because of changes in surveillance methodologies.

S: Given the adjustment of the combined rates, due to the survey particularities, no *P*-values can be determined

Annex 15: Trends of MDR resistance (%) among combined cases in 26 countries/settings (1994-2002)

Country/Setting	Years of observation									P-Value
	1994	1995	1996	1997	1998	1999	2000	2001	2002	
Australia	.	0.7	2.0	.	0.9	0.5	1.0	.	.	ns
Botswana	.	0.8	.	.	.	1.2	.	.	2.7	S
Canada	.	.	.	1.1	0.9	0.8	1.0	.	.	ns
China-Hong Kong SAR	.	.	2.6	1.7	2.0	1.4	1.5	1.3	.	<0.0001
Cuba	.	1.0	.	.	0.9	.	0.5	.	.	S
Czech Republic	.	1.4	.	.	.	0.6	1.5	.	.	S
Denmark	0.7	0.0	0.5	.	.	ns
Estonia	11.0	.	.	.	18.3	22.8	19.5	.	.	S
Finland	.	.	.	0.0	.	0.0	0.5	.	.	ns
France	.	0.9	.	0.4	.	1.4	1.3	.	.	S
Germany	.	.	.	1.4	1.4	1.4	1.6	.	.	ns
Israel	8.1	7.9	14.6	.	.	0.009
Latvia	.	.	30.3	.	12.2	13.5	13.1	.	.	S
Lithuania	24.7	25.5	.	30.8	<0.0001
Netherlands	.	1.1	0.6	.	.	0.4	0.9	.	.	ns
New Zealand	.	1.3	0.0	0.7	1.8	0.8	0.4	0.0	.	ns
Norway	.	.	2.8	.	.	1.6	1.8	.	.	ns
Puerto Rico	2.6	.	.	3.5	1.4	0.6	0.7	.	.	ns
Russian Fed. Tomsk Oblast	13.7	.	12.8	17.3	19.1	0.003
Slovakia	2.0	1.0	1.2	.	.	ns
Slovenia	.	.	.	0.9	.	0.6	0.0	.	.	ns
Spain-Barcelona	.	2.0	.	1.4	.	2.2	3.7	3.7	.	S
Sweden	.	.	.	1.1	.	1.7	1.4	.	.	ns
Switzerland	.	.	.	1.4	.	1.8	0.4	.	.	ns
United Kingdom - England, Wales, Northern Ireland ^a	.	1.9	.	1.5	.	0.6	1.2	.	.	0.0008
United States	.	2.0	.	1.4	1.2	1.3	1.3	1.4	.	<0.0001

^a Data from England, Wales and Northern Ireland reported before 1999 cannot be compared with data reported after 1999, because of changes in surveillance methodologies.

S: Given the adjustment of the combined rates, due to the survey particularities, no P-values can be determined

Annex 16: Trends of any INH resistance (%) among combined cases in 26 countries/settings (1994-2002)

Country/Setting	Year of observation									P-Value
	1994	1995	1996	1997	1998	1999	2000	2001	2002	
Australia	.	7.5	9.7	.	9.0	6.8	10.1	.	.	ns
Botswana	.	2.4	.	.	.	5.4	.	.	6.6	S
Canada	.	.	.	7.8	7.4	8.0	7.3	.	.	0.003
China-Hong Kong SAR	.	.	7.8	6.9	7.6	6.5	6.9	6.1	.	ns
Cuba	.	2.8	.	.	3.1	.	1.7	.	.	S
Czech Republic	.	2.8	.	.	.	2.1	3.6	.	.	S
Denmark	6.5	7.5	8.7	.	.	ns
Estonia	23.3	.	.	.	31.2	31.9	30.0	.	.	S
Finland	.	.	.	4.6	.	0.7	3.4	.	.	ns
France	.	4.5	.	4.0	.	4.7	3.8	.	.	S
Germany	.	.	.	5.8	6.5	5.5	6.1	.	.	ns
Israel	15.6	13.3	26.3	.	.	0.001
Latvia	.	.	46.8	.	28.3	28.5	30.3	.	.	S
Lithuania	37.4	38.7	.	44.9	<0.0001
Netherlands	.	8.6	6.8	.	.	5.8	5.9	.	.	0.01
New Zealand	.	4.0	4.6	10.2	12.0	6.4	10.1	6.1	.	ns
Norway	.	.	8.3	.	.	6.0	12.4	.	.	ns
Puerto Rico	7.7	.	.	9.9	8.6	1.7	4.3	.	.	S
Russian Fed. Tomsk Oblast	27.7	.	29.0	34.6	33.1	0.008
Slovakia	4.6	2.4	4.7	.	.	ns
Slovenia	.	.	.	1.5	.	2.7	2.8	.	.	ns
Spain-Barcelona	.	8.4	.	4.1	.	6.3	7.5	8.5	.	S
Sweden	.	.	.	6.3	.	10.3	10.1	.	.	0.04
Switzerland	.	.	.	5.2	.	6.5	4.9	.	.	ns
United Kingdom - England, Wales, Northern Ireland ^a	.	6.8	.	5.9	.	5.9	6.4	.	.	---
United States	.	8.4	.	8.34	8.6	7.9	8.3	8.0	.	ns

^a Data from England, Wales and Northern Ireland reported before 1999 cannot be compared with data reported after 1999, because of changes in surveillance methodologies.

S: Given the adjustment of the combined rates, due to the survey particularities, no P-values can be determined

Annex 17: Trends of any RMP resistance (%) among combined cases in 26 countries/settings (1994-2002)

Country/Setting	Years of observation									P-Value
	1994	1995	1996	1997	1998	1999	2000	2001	2002	
Australia	.	1.1	2.1	.	1.1	0.8	1.3	.	.	ns
Botswana	.	1.7	.	.	.	1.7	.	.	4.7	S
Canada	.	.	.	1.1	0.9	1.0	1.2	.	.	ns
China-Hong Kong SAR	.	.	3.1	2.1	2.2	1.7	1.6	1.4	.	<0.0001
Cuba	.	1.4	.	.	0.9	.	1.0	.	.	S
Czech Republic	.	1.4	.	.	.	1.1	1.6	.	.	S
Denmark	0.7	0.2	0.7	.	.	ns
Estonia	11.0	.	.	.	18.7	23.0	19.5	.	.	S
Finland	.	.	.	0.0	.	0.0	0.9	.	.	-
France	.	1.3	.	0.8	.	1.5	1.5	.	.	S
Germany	.	.	.	1.7	1.8	1.8	1.8	.	.	ns
Israel	8.5	8.5	14.9	.	.	0.01
Latvia	.	.	31.8	.	12.5	13.7	13.1	.	.	S
Lithuania	27.6	26.9	.	31.0	0.0004
Netherlands	.	0.2	1.0	.	.	0.9	0.9	.	.	ns
New Zealand	.	1.3	0.0	2.2	1.8	1.2	0.4	0.3	.	ns
Norway	.	.	2.8	.	.	1.6	2.4	.	.	ns
Puerto Rico	3.6	.	.	4.7	1.4	1.2	1.4	.	.	ns
Russian Fed. Tomsk Oblast	16.2	.	15.2	18.9	20.3	0.031
Slovakia	2.4	1.7	1.6	.	.	ns
Slovenia	.	.	.	0.9	.	0.6	0.0	.	.	ns
Spain-Barcelona	.	2.7	.	1.4	.	3.3	3.1	2.8	.	S
Sweden	.	.	.	1.1	.	2.2	1.4	.	.	ns
Switzerland	.	.	.	1.7	.	2.1	.	0.6	.	ns
United Kingdom - England, Wales, Northern Ireland ^a	.	2.1	.	1.6	.	0.7	.	1.6	.	---
United States	.	2.7	.	2.0	1.6	1.5	1.7	1.7	.	<0.0001

^a Data from England, Wales and Northern Ireland reported before 1999 cannot be compared with data reported after 1999, because of changes in surveillance methodologies.

S: Given the adjustment of the combined rates, due to the survey particularities, no P-values can be determined

Annex 18: Ecological bivariate analysis among new TB cases in all countries/settings

All countries/settings (n=60)	Any resistance rates (P-value)	MDR rates (P-value)
Out-of-pocket health expenditure	0.297 (0.021)	0.257 (0.047)
Human Development Index	0.253 (0.051)	- 0.259 (0.046)
GDP	- 0.284 (0.028)	- 0.314 (0.015)
GINI	0.294 (0.023)	0.306 (0.017)
Responsiveness level		
- level index	- 0.150 (0.252)	- 0.257 (0.047)
- distribution index	- 0.191 (0.151)	- 0.265 (0.045)
Fairness index	- 0.293 (0.023)	- 0.343 (0.007)
Performance index	- 0.411 (0.001)	- 0.393 (0.002)
Notified TB incidence rate (new cases)	0.353 (0.006)	0.401 (0.001)
% Re-treatment cases	0.224 (0.085)	0.337 (0.006)
Human Poverty Index	0.313 (0.015)	0.358 (0.005)
Duration of introduction of RIF	0.214 (0.122)	0.301 (0.047)

Annex 19: Selective ecological bivariate analysis among new TB cases in medium- and low- income

Medium- and low-income countries/settings (n=36)	Any resistance rates (P-value)	MDR rates (P-value)
Out-of-pocket health expenditure	0.327 (0.045)	0.182 (0.289)
GDP	- 0.348 (0.038)	- 0.145 (0.397)
GINI	0.338 (0.044)	0.317 (0.060)
Health expenditure	- 0.374 (0.025)	- 0.311 (0.065)
Fairness index	- 0.437 (0.008)	- 0.367 (0.028)
Performance index	- 0.500 (0.002)	- 0.475 (0.003)
Notified TB incidence rate (new cases)	0.449 (0.006)	- 0.342 (0.041)
% Re-treatment cases	0.402 (0.015)	0.591 (0.001)

Annex 20: Ecological bivariate analysis among combined TB cases in all countries/settings

All countries/settings (n=56)	Any resistance rates (P-value)	MDR rates (P-value)
Out of pocket health expenditure	0.303 (0.024)	0.244 (0.070)
Human Development Index	0.296 (0.024)	- 0.376 (0.004)
GDP	- 0.353 (0.008)	- 0.403 (0.002)
GINI	0.310 (0.020)	0.299 (0.025)
Human Poverty Index	0.362 (0.006)	0.467 (0.001)
Education index	0.148 (0.277)	0.270 (0.044)
Responsiveness		
- level index	- 0.235 (0.082)	- 0.331 (0.013)
- distribution index	- 0.266 (0.052)	- 0.341 (0.012)
Fairness index	- 0.407 (0.002)	- 0.447 (0.001)
Performance index	- 0.412 (0.002)	- 0.371 (0.005)
Health expenditure	- 0.324 (0.015)	- 0.404 (0.002)
Notified TB incidence rate (new cases)	0.401 (0.002)	0.462 (0.001)
% Re-treatment cases	0.227 (0.067)	0.309 (0.021)
HIV rate in adults	0.275 (0.040)	0.251 (0.062)

Annex 21: Selective ecological bivariate analysis among combined TB cases in medium- and low-income

Medium- and low-income countries/settings (n=32)	Any resistance rates (P-value)	MDR rates (P-value)
GINI	0.355 (0.046)	0.247 (0.174)
Health expenditure	- 0.476 (0.006)	- 0.491 (0.004)
Fairness index	- 0.468 (0.007)	- 0.338 (0.058)
Performance index	- 0.471 (0.007)	- 0.410 (0.020)
Notified TB incidence rate (new cases)	0.416 (0.018)	- 0.308 (0.086)
% Re-treatment cases	0.457 (0.009)	0.537 (0.002)

Annex 22: Ecological multivariate analysis among new TB cases in all countries/settings

All countries/settings (n=60)

OUTCOME VARIABLE: PREVALENCE OF ANY RESISTANCE

$$\text{Model} = 0.189 + 0.0065 \text{ Re-treatment} - 0.0035 \text{ HPI}$$

Re-treatment: p<0.001

HPI: p= 0.054

 $R^2=25\%^a$

OUTCOME VARIABLE: PREVALENCE OF MDR

$$\text{Model} = 0.094 + 0.0039 \text{ Re-treatment} - 0.00002 \text{ GDP}$$

Re-treatment: p<0.0001

GDP: p= 0.068

 $R^2=28\%$

Low- and middle-income countries (n=36)

OUTCOME VARIABLE: PREVALENCE OF ANY RESISTANCE

$$\text{Model} = 0.38 + 0.0067 \text{ Re-treatment} - 0.00001 \text{ GDP}$$

Re-treatment: p=0.001

GDP: p= 0.006

 $R^2=40\%$

OUTCOME VARIABLE: PREVALENCE OF MDR

$$\text{Model} = -0.326 + 0.003 \text{ Re-treatment} - 0.0001 \text{ GDP} + 0.004 \text{ HPI} - 0.571 \text{ HDI}$$

Re-treatment: p=0.006

GDP: p= 0.025

HPI: p=0.065

HDI :p=0.0044

 $R^2=42\%$

^a The R^2 , called also "coefficient of determination" is a measure of the goodness of fit of the linear regression model to the data. It expresses the percentage of the variation in the outcome variable that has been explained by the regression on the explanatory variables. In the example, $R^2 = 25\%$ implies that 25% of the variation of any resistance rate over the 60 countries is explained by the variables "re-treatment cases" and "HPI".

Annex 23: Ecological multivariate analysis among combined TB cases in all countries/settings

All countries/settings (n=56)

OUTCOME VARIABLE: PREVALENCE OF ANY RESISTANCE

$$\text{Model} = 0.327 + 0.009 \text{ Re-treatment} - 0.00005 \text{ GDP}$$

Re-treatment: $p < 0.0001$

GDP: $p = 0.068$

$R^2 = 28\%$

OUTCOME VARIABLE: PREVALENCE OF MDR

$$\text{Model} = 0.129 + 0.0076 \text{ Re-treatment} - 0.0000037 \text{ GDP}$$

Re-treatment: $p < 0.0001$

GDP: $p = 0.010$

$R^2 = 45\%$

Low- and median-income countries (n=32)

OUTCOME VARIABLE: PREVALENCE OF ANY RESISTANCE

$$\text{Model} = 0.382 + 0.010 \text{ Re-treatment} - 0.00002 \text{ GDP}$$

Re-treatment: $p < 0.001$

GDP: $p = 0.006$

$R^2 = 50\%$

OUTCOME VARIABLE: PREVALENCE OF MDR

$$\text{Model} = 0.096 + 0.0076 \text{ Re-treatment}$$

Re-treatment: $p < 0.0001$

$R^2 = 40\%$

Annex 24: Forecast of the number of MDR cases (with 95% CI) 1999-2002

COUNTRY/SETTING	TOTAL NO. OF CASES	% MDR	LOWER 95% CI	UPPER 95% CI	LOWER ESTIMATE OF NO. OF MDR CASES	ESTIMATE OF NO. OF MDR CASES	HIGHER ESTIMATE OF NO. OF MDR CASES
South Africa*	103626	2.9	2.8	3.0	2902	2957	3109
Kazakhstan*	11980	24.4	23.7	25.2	2839	2926	3019
China, Hubei Province*	23633	7.0	6.7	7.3	1583	1653	1725
China, Henan Province*	15125	10.1	9.6	10.6	1452	1527	1603
China, Liaoning Province	8002	13.0	12.2	13.7	976	1037	1096
Nepal*	15727	3.8	3.5	4.1	550	600	645
Thailand*	29768	1.8	1.7	2.0	506	541	595
Egypt*	5470	8.5	7.8	9.3	427	467	509
Ecuador*	5029	8.7	8.0	9.6	402	439	483
Uzbekistan, Karakalpakstan	1294	26.8	24.4	29.3	316	347	379
Zambia*	14546	1.8	1.6	2.1	233	269	305
Lithuania	1140	21.8	19.4	24.3	221	248	277
Japan, sentinel*	12013	1.8	1.6	2.1	192	222	252
Argentina*	6602	3.0	2.6	3.4	172	196	224
Latvia	1144	13.1	11.2	15.2	128	150	174
United States	10288	1.4	1.1	1.6	113	140	165
Russian Federation, Tomsk Oblast	650	19.1	16.2	22.4	105	124	146
Colombia*	8022	1.5	1.3	1.8	104	121	144
Estonia	527	19.5	16.3	23.2	86	103	122
Russian Federation, Orel Oblast	589	16.8	13.9	20.1	82	99	118
Botswana*	3452	2.7	2.2	3.3	76	94	114
Poland	3705	2.5	2.0	3.1	74	92	115
Turkmenistan, Dashoguz	791	11.6	9.5	14.1	75	92	112
Algeria*#	7953	1.1	.9	1.4	72	88	111
Venezuela*	3812	1.7	1.3	2.1	50	63	80
Honduras*	2983	2.0	1.6	2.6	48	61	78
Germany	2780	1.7	1.3	2.3	36	47	64
China, Hong Kong SAR	3639	1.3	.9	1.7	33	46	62
Israel	281	14.6	10.8	19.4	30	41	55
United Kingdom - England, Wales and Northern Ireland	3004	1.2	.9	1.7	27	37	51
India, Raichur District	1241	2.6	1.8	3.7	22	32	46
Cambodia*	15188	.2	.1	.3	15	26	46
Italy (half of the country)	1387	1.7	1.1	2.5	15	23	35

* Survey methodology applied. For countries conducting surveys on a sample of the population, estimates were generated by applying prevalences determined in surveys to reported notification figures for the corresponding population and thus are dependent upon the level of case-finding in the country and quality of recording and reporting of the national programme.

New cases only.

COUNTRY/SETTING	TOTAL NO. OF CASES	% MDR	LOWER 95% CI	UPPER 95% CI	LOWER ESTIMATE OF NO. OF MDR CASES	ESTIMATE OF NO. OF MDR CASES	HIGHER ESTIMATE OF NO. OF MDR CASES
Chile*	1505	1.4	.9	2.2	14	21	33
France, sentinel sites*	2398	.8	.5	1.3	12	20	31
El Salvador*	1184	1.4	.9	2.3	11	17	27
Mongolia*#	1631	1.0	.6	1.7	10	17	28
Canada	1363	1.0	.5	1.7	7	13	23
Belgium	730	1.5	.8	2.8	6	11	20
Spain, Galicia State*	493	2.2	1.2	4.1	6	11	20
Czech Republic	638	1.4	.7	2.8	4	9	18
Netherlands	863	.9	.4	1.9	3	8	16
Oman	183	3.8	1.7	8.0	3	7	15
Slovakia	575	1.2	.5	2.6	3	7	15
Spain, Barcelona City*	240	2.5	1.0	5.6	2	6	13
The Gambia*	876	.6	.2	1.4	2	5	12
Bosnia and Herzegovina	1153	.4	.2	1.1	2	5	13
Sweden	365	1.4	.5	3.4	2	5	12
Singapore	949	.5	.2	1.3	2	5	12
Cuba, sentinel*	620	.6	.2	1.8	1	4	11
Austria	761	.5	.2	1.4	2	4	11
India, Wardha District,	800	.5	.2	1.4	2	4	11
Ireland	225	1.3	.3	4.2	1	3	9
Norway	170	1.8	.5	5.5	1	3	9
Croatia	879	.2	.1	.9	1	2	8
Uruguay*#	392	.5	.1	2.0	0	2	8
Denmark	425	.5	.1	1.9	0	2	8
Finland	437	.5	.1	1.8	0	2	8
Switzerland	492	.4	.1	1.6	0	2	8
Puerto Rico	139	.7	.1	4.5	0	1	6
Qatar#	284	.4	.1	2.3	0	1	7
Serbia and Montenegro	279	.4	.0	2.3	0	1	6
Luxembourg	44	.0	.0	10.0	0	0	4
Andorra	3	.0	.0	69.0	0	0	2
Malta	10	.0	.0	34.5	0	0	3
Iceland	9	.0	.0	37.1	0	0	3
Slovenia	320	.0	.0	1.5	0	0	5
New Zealand	294	.0	.0	1.6	0	0	5
Scotland	302	.0	.0	1.6	0	0	5

* Survey methodology applied. For countries conducting surveys on a sample of the population, estimates were generated by applying prevalences determined in surveys to reported notification figures for the corresponding population and thus are dependent upon the level of case-finding in the country and quality of recording and reporting of the national programme.

New cases only.

Annex 25: GLC operations June 2000-November 2004

Countries with DOTS-Plus approved projects	Countries with projects under review	Pipeline
Peru	Azerbaijan	Kosovo
Estonia	Dominican Republic	Tadjikistan
Latvia	Moldova	Ecuador
Russia (Tomsk)	Kenya	Viet Nam
Russia (Orel)	India (Delhi)	Morocco
Russia (Arkhangelsk)	Tunisia	Paraguay
Russia (Ivanovo)		Mongolia
Philippines		South Africa
Mexico		India
Malawi		Iran
Bolivia		
Haiti		
Costa Rica		
Uzbekistan		
Nepal		
Lebanon		
El Salvador		
Egypt		
Nicaragua		
Romania		
Honduras		
Kyrgyzstan		
Abkhazia		
Syria		
Jordan		
Kenya		
Georgia		



REFERENCES

- 1 Stýblo K, Daňková D, Drápela J, Calliová J, Jezek Z, Krivánek J, et al. Epidemiological and clinical study of tuberculosis in the district of Kolín, Czechoslovakia. *Bulletin of the World Health Organization*, 1967, 37:819-74.
- 2 Dye C, Zhao F, Scheele S, Williams B. Evaluating the impact of tuberculosis control: number of deaths prevented by short-course chemotherapy in China. *International Journal of Epidemiology*, 2000, 29:558-564.
- 3 Chaulet P, Boulahbal F, Grosset J. Surveillance of drug resistance for tuberculosis control: why and how? *Tubercle and Lung Disease*, 1995, 76:487-492.
- 4 World Health Organization. *WHO Global Strategy for Containment of Antimicrobial Resistance*. Geneva, 2001 (WHO/CDS/CSR/DRS/2001.2).
- 5 Crofton J, Mitchison DA. Streptomycin resistance in pulmonary tuberculosis. *British Medical Journal*, 1948, 2:1009-1015.
- 6 Mitchison DA. Development of streptomycin resistant isolates of tubercle bacilli in pulmonary tuberculosis. *Thorax*, 1950, 4:144.
- 7 Canetti G. Present aspects of bacterial resistance in tuberculosis. *American Review of Respiratory Diseases*, 1965, 92:687-703.
- 8 Hong Kong Government Tuberculosis Services / British Medical Research Council Cooperative Investigation. Drug resistance in patients with pulmonary tuberculosis presenting at chest clinics in Hong Kong. *Tubercle*, 1964, 45:77-95.
- 9 Public Health Service Cooperative Investigation. Prevalence of drug resistance in previously untreated patients. *American Review of Respiratory Diseases*, 1964, 89:327-336.
- 10 Pyle MM. Relative numbers of resistant tubercle bacilli in sputa of patients before and during treatment with streptomycin. *Proceedings of the Mayo Clinic*, 1947, 22:465.
- 11 Mahmoudi A, Iseman MD. Pitfalls in care of patients with tuberculosis. *Journal of the American Medical Association*, 1993, 270:65-68.

- 12 Kochi A, Vareldzis B, Styblo K. Multi-drug resistant tuberculosis and its control. *Research in Microbiology*, 1993, **73**:219-224.
- 13 Mitchison DA. Natural sensitivity of *M. tuberculosis* to thiacetazone. *Tubercle*, 1968, 49:38.
- 14 Konno K, Feldmann FM, McDermott W. Pyrazinamide susceptibility and amidase activity of tubercle bacilli. *American Review of Respiratory Diseases*, 1967, **95**:461.
- 15 Stewart SM, Hall E, Riddell RW, Somner AR. Bacteriological aspects of the use of ethionamide, pyrazinamide and cycloserine in the treatment of chronic pulmonary tuberculosis. *Tubercle*, 1962, 43:417-31.
- 16 World Health Organization. *Anti-tuberculosis drug resistance in the world: The WHO/IUATLD Global Project on Anti-Tuberculosis Drug Resistance Surveillance. Report 2: Prevalence and trends*. Geneva, 2000 (WHO/CDS/TB/2000.278).
- 17 Espinal MA, Laszlo A, Simonsen L, Boulahbal F, Kim SJ, Reniero A, et al. Global trends in resistance to antituberculosis drugs. *New England Journal of Medicine*, 2001, 344:1294-1302.
- 18 World Health Organization. *Guidelines for surveillance of drug resistance in tuberculosis*. Geneva, 2003 (WHO/CDS/CSR/RMD/2003.3).
- 19 Laserson KF, Kenyon AS, Kenyon TA, Layloff T, Binkin NJ. Substandard tuberculosis drugs on the global market and their simple detection. *International Journal of Tuberculosis and Lung Disease*, 2001, 5(5):448-454.
- 20 World Health Organization. *Involving private practitioners in tuberculosis control: issues, interventions, and emerging policy framework*. Geneva, 2001 (WHO/CDS/TB/2001.285).
- 21 Lansang MA, Lucas-Aquino R, Tupasi TE, Minaus Salazare LS, Juban N, Limjoco TT, et al. Purchase of antibiotics without prescription in Manila, the Philippines: inappropriate choices and doses. *Journal of Clinical Epidemiology*, 1990, 43(1):61-67
- 22 Greenhalgh T. Drug prescription and self-medication in India. *Social Science and Medicine*, 1987, 25(3):307-318.
- 23 Lonroth K, Lambregts K, Nhien DTT, Quy HT, Diwan VK. Private pharmacies and TB control – a survey of case detection skills and reported anti-TB dispensing in private pharmacies in Ho Chi Minh City, Vietnam. *International Journal of Tuberculosis and Lung Disease*, 2000, 4: 1052-1059.
- 24 Hurtig AK, Pande SB, Baral SC, Porter JDH, Bam DS. Anti-tuberculosis treatment in private pharmacies, Kathmandu Valley, Nepal. *International Journal of Tuberculosis and Lung Disease*, 2000, 4(8):730-736.

- 25 Aluoch JA, Edwards EA, Stott H, Fox W, Sutherland I. A fourth study of case-finding methods for pulmonary tuberculosis in Kenya. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 1982, 79:679-691.
- 26 Ollé-Goig JE, Cullity JE, Vargas R. A survey of prescribing patterns for tuberculosis treatment amongst doctors in a Bolivian city. *International Journal of Tuberculosis and Lung Disease*, 1999, 3:74-78.
- 27 Sumartojo EM, Geiter LJ, Miller B, Hale BE. Can physicians treat tuberculosis? Report on a national survey of physician practice. *American Journal of Public Health*, 1997, 87:2008-2011.
- 28 Liu Z, Shilkret KL, Finelli L. Initial drug regimens for the treatment of tuberculosis: evaluation of physician prescribing practice in New Jersey, 1994-1995. *Chest*, 1998, 113:1446-1451.
- 29 Corbett LE, Watt CJ, Walker N, Maher D, Williams BG, Raviglione MC, Dye C. The growing burden of tuberculosis. *Archives of Internal Medicine*, 2003, 163:1009-1021.
- 30 World Health Organization. *Forty-fourth World Health Assembly*. Geneva, 1991 (WHA44/1991/REC/1).
- 31 World Health Organization. *An expanded DOTS framework for effective tuberculosis control*. Geneva, 2002 (WHO/CDS/TB/2002.297).
- 32 World Bank. *World Development Report 1993: investing in health*. New York, Oxford University Press, 1993.
- 33 World Health Organization. *Anti-tuberculosis drug resistance in the world: the WHO/IUATLD Global Project on Anti-Tuberculosis Drug Resistance Surveillance*. Geneva, 1997 (WHO/TB/97.229).
- 34 Pablos-Méndez A, Raviglione MC, Laszlo A, Binkin N, Rieder HL, Bustreo F, et al. Global surveillance for antituberculosis-drug resistance, 1994-1997. *New England Journal of Medicine*, 1998, 338:1641-1649.
- 35 Espinal MA, Kim SJ, Suarez PG, Kam KM, Khomenko AG, Migliori GB, et al. Standard short-course chemotherapy for drug-resistant tuberculosis: Treatment Outcomes in 6 Countries. *Journal of the American Medical Association*, 2000, 283(19): 2537-2545.
- 36 World Health Organization. *Guidelines for establishing DOTS- PLUS pilot projects for the management of multi-drug resistant tuberculosis (MDR-TB)*. Geneva, 2000 (WHO/CDS/TB/2000.279).
- 37 Cohn DL, Bustreo F, Raviglione MC. Drug-resistant tuberculosis: review of the worldwide situation and the WHO/IUATLD Global Surveillance Project. *Clinical Infectious Diseases*, 1997, 24(Suppl 1):S121-30.

- 38 Smith I, Arnold V, Kumaresan J. Global Drug Facility: improving access to TB drugs. *WHO Essential Drugs Monitor*, 2003, 32.
- 39 Kumaresan J, Smith I, Arnold V, Evans P. The Global TB Drug Facility: innovative global procurement. *International Journal of Tuberculosis and Lung Disease*, 2004, 8(1):130-138.
- 40 Gupta R, Cegielski JP, Espinal MA, Henkens M, Kim JY, Lambregts-Van Weezenbeek CS, et al. Increasing transparency in partnerships for health: introducing the Green Light Committee. *Tropical Medicine and International Health*, 2002, 7(11):970-976.
- 41 Gupta R, Kim JK, Espinal MA. Responding to market failures in tuberculosis control. *Science*, **293**:1049-1051.
- 42 Gordin FM, Nelson ET, Matts JP, et al. The impact of human immunodeficiency virus infection on drug resistant tuberculosis. *American Journal of Respiratory and Critical Care Medicine*, 1996, 154:1478-1483.
- 43 Espinal MA, Laserson K, Camacho M, Fusheng Z, Kim SJ, Tlali RE, et al. Determinants of drug-resistant tuberculosis: analysis of 11 countries. *International Journal of Tuberculosis and Lung Disease*, 2001, **5**(10): 887-893.
- 44 Dupon M, Texier-Maugein J, Leroy V, et al. Tuberculosis and HIV infection: a cohort study of incidence and susceptibility to antituberculosis drugs, Bordeaux, 1985-1993. *AIDS*, 1995, 9:577-578.
- 45 Dooley SW, Jarvis WR, Marlone WJ, Snider DE. Multi-drug resistant tuberculosis. *Annals of Internal Medicine*, 1992, **117**:257-259.
- 46 Edlin BR, Tokars JL, Grieco MH, et al. An outbreak of multi-drug resistant tuberculosis among hospitalized patients with the acquired immunodeficiency syndrome. *New England Journal of Medicine*, 1992, **326**:1514-1521.
- 47 Coronado VG, Beck-Sague CM, Hutton MD, et al. Transmission of multi-drug resistant *Mycobacterium tuberculosis* among persons with human immunodeficiency virus infection in an urban hospital: epidemiologic and restriction fragment length polymorphism analysis. *Journal of Infectious Diseases*, 1993, **168**:1052-1055.
- 48 Centers for Disease Control and Prevention. Nosocomial transmission of multidrug-resistant tuberculosis among HIV-infected persons – Florida and New York, 1988-1991. *Morbidity and Mortality Weekly Report*, 1991, **40**:585-591.
- 49 Ritacco V, DiLonardo M, Reniero A, Ambroggi M, Barrera, Dambrosi A, et al. Nosocomial spread of HIV-related multidrug resistant tuberculosis in Buenos Aires. *Journal of Infectious Diseases*, 1997, 176:637-642.
- 50 Monno L, Angarano G, Carbonara S, et al. Emergence of drug resistant *Mycobacterium tuberculosis* in HIV-infected patients. *Lancet*, 1991, **337**:852.

- 51 Bouvet E. Transmission nosocomiale de tuberculose multirésistante parmi les patients infectés par le VIH: en France, à Paris. *Bulletin épidémiologique hebdomadaire*, 1991, **45**:196-197.
- 52 Coronado VG, Beck-Sague CM, Hutton MD, Davis BJ, Nicholas P, Villareal C, et al. Transmission of drug-resistant *Mycobacterium tuberculosis* among persons with human immunodeficiency virus infection in urban hospital: epidemiologic and restriction fragment length polymorphism analysis. *Journal of Infectious Diseases*, 1993, **168**:1052-1055.
- 53 Rajeswari R, Balasubramanian R, Bose MSC, Sekar L, Rahman F. Private pharmacies in tuberculosis control- a neglected link *International Journal of Tuberculosis and Lung Disease*, 2002, **6**(2):171-173.
- 54 Uplekar MW, Rangan S. Private doctors and tuberculosis control in India. *Tubercle and Lung Disease*, 1993, **74**:332-337.
- 55 Uplekar MW, Juvekar SK, Parande DB, et al. Tuberculosis management in private practice and its implications. *Indian Journal of Tuberculosis*, 1996, **43**:19-22.
- 56 Singla N, Sharma PP, Singla R, Jain RC. Survey of knowledge, attitudes and practices for tuberculosis among general practitioners in Delhi, India. *International Journal of Tuberculosis and Lung Disease*, 1998, **2**:384-389.
- 57 Uplekar M, Juvekar S, Morankar S, Rangan S, Nunn P. Tuberculosis patients and practitioners in private clinics in India. *International Journal of Tuberculosis and Lung Disease*, 1998, **2**:324-329.
- 58 World Health Organization. *Laboratory services in tuberculosis control. Part III: Culture*. Geneva, 1998 (WHO/TB/98.258).
- 59 Vestal AL, Kubica GP. Differential identification of mycobacteria III. Use of thiacetazone, thiophen-2-carboxylic acid hydrazide and triphenyltetrazolium chloride. *Scandinavian Journal of Respiratory Diseases*, 1967, **48**:142-148.
- 60 Canetti G, Froman S, Grosset J, Hauduroy P, Langerova M, Mahler HT, et al. Mycobacteria: laboratory methods for testing drug sensitivity and resistance. *Bulletin of the World Health Organization*, 1963, **29**:565-578.
- 61 Canetti G, Fox W, Khomenko A, Mahler HT, Menon NK, Mitchison DA, et al. Advances in techniques of testing mycobacterial drug sensitivity, and the use of sensitivity tests in tuberculosis control programmes. *Bulletin of the World Health Organization*. 1969; **41**(1):21-43.
- 62 Siddiqi SH. *BACTEC 460TB system. Product and procedure manual*, 1996. Becton Dickinson and Company, 1996.

- 63 Brenner E. *Surveillance of drug resistance in tuberculosis software: SDRTB3*. Geneva, World Health Organization Geneva. 2000.
- 64 World Health Organization. *Global tuberculosis control; surveillance, planning, financing*. Geneva, 2003 (WHO/CDS/TB/2003.316).
- 65 Ford BL. An overview of hot-deck procedures. In: Madow WG, Olkin I, Rubin DB, eds., *Incomplete data in sample surveys*. New York, Academic Press, 1983:185-207.
- 66 Laszlo A, Rahman M, Espinal M, Raviglione M. Quality assurance programme for drug susceptibility testing of *Mycobacterium tuberculosis* in the WHO/IUATLD Supranational Reference Laboratory Network: five rounds of proficiency testing, 1994–1998. *The International Journal of Tuberculosis and Lung Disease*, 2002, 6(9):748-756.
- 67 United Nations Development Programme. *Human Development Report 2002: Deepening democracy in a fragmented world*. New York, 2002.
- 68 World Health Organization. *Global tuberculosis control; surveillance, planning, financing*. Geneva, 2002 (WHO/CDS/TB/2002.295).
- 69 Joint United Nations Programme on HIV/AIDS (UNAIDS). *Report on the global HIV/AIDS epidemic*. Geneva, 2002 (UNAIDS/02.26E).
- 70 United Nations Development Programme. *Human Development Report 2003: Millennium Development Goals: A compact among nations to end human poverty*. New York, 2003.
- 71 World Health Organization. *The World Health Report 2002: changing history*. Geneva, 2002.
- 72 World Health Organization. *The World Health Report 2000: Health systems: improving performance*. Geneva, 2000.
- 73 Watterson S, Wilson SM, Yates MD, Drobniewski F. A comparison of three molecular assays for rapid detection of rifampin resistance in *Mycobacterium tuberculosis*. *Journal of clinical microbiology*, 1998, **36**:1969-1973.
- 74 Gamboa F, Cardona PJ, Mandeerola JM, et al. Evaluation of a commercial probe assay for detection of rifampin resistance in *Mycobacterium tuberculosis* directly from respiratory and non respiratory clinical specimens. *European Journal of Clinical Microbiology and Infectious Diseases*, 1998, **17**:189-192.
- 75 Traore H, Fissette K, Bastian I, Devleeschhouwer F, Portaels F. Detection of rifampicin resistance in *Mycobacterium tuberculosis* isolates from diverse countries by a commercial line probe assay as an initial indicator of multidrug resistance. *International Journal of Tuberculosis and Lung Disease*, 2000, **4**(5):481-484.

- 76 Drobniewski F, Balabanova Y, Ruddy M, Weldon L, Jeltkova K, Brown T, et al. Rifampin- and multidrug-resistant tuberculosis in Russian civilians and prison inmates: dominance of the Beijing strain family. *Emerging Infectious Disease*, 2002, **8**(11):1320-1326.
- 77 Kenyon TA, Mwasekaga MJ, Huebner R, Rumisha D, Binkin N, Maganu E. Low levels of drug resistance amidst rapidly increasing tuberculosis and human immunodeficiency virus: co-epidemics in Botswana. *International Journal of Tuberculosis and Lung Disease*, 1999, **3**: 4-11.
- 78 Weyer K, Groenwald P, Zwarenstein M, Lombard CJ. Tuberculosis drug resistance in the Western Cape. *South African Medical Journal*, 1995, **85**(6):499-504.
- 79 Chemtob D, Epstein L, Slater P, Weiler-Ravell D. Epidemiological analysis of tuberculosis treatment outcome as a tool for changing tuberculosis control policy in Israel. *Israel Medical Association Journal*, 2001, **3**:479-483.
- 80 Sosna J, Shulimzon T, Roznman J, Lidgi M, Lavy A, Ben-Dov IZ, Ben-Dov I. Drug-resistant pulmonary tuberculosis in Israel, a society of immigrants: 1985-1994. *International Journal of Tuberculosis and Lung Disease*, 1999, **3**(8):689-694.
- 81 Chemtob D, Leventhal A, Weiler-Ravell D. Screening and management of tuberculosis in immigrants: the challenge beyond professional competence. *International Journal of Tuberculosis and Lung Disease*, 2003, **7**(10):959-966.
- 82 Chemtob D, Leventhal A, Berlowitz Y, Weiler-Ravell D. The new National Tuberculosis Control Programme in Israel, a country of high immigration. *International Journal of Tuberculosis and Lung Disease*, 2003, **7**(8):828-836.
- 83 Augustynowicz-Kopec E, Zwolska Z, Jaworski A, Kostrzewa E, Klatt M. Drug-resistant tuberculosis in Poland in 2000: second national survey and comparison with the 1997 survey. *International Journal of Tuberculosis and Lung Disease*, 2003, **4**(7):645-651.
- 84 Yoshiyama T, Supawitkul S, Kunyanone N, Rienthong D, Yanai H, Abe C, et al. Prevalence of drug-resistant tuberculosis in an HIV endemic area in northern Thailand. *International Journal of Tuberculosis and Lung Disease*, 2001, **5**(1):32-39.
- 85 Kai Man Kam, Chi Wai Yip, Lai Wa Tse, Oi Chi Leung, Lai Ping Sin, Mei Yuk Chan, Wai Sum Wong. Trends in multidrug-resistant Mycobacterium tuberculosis in relation to sputum smear positivity in Hong Kong, 1989-1999. *Clinical Infectious Disease* 2002:34.
- 86 Quy HTW, Lan NTN, Borgdorff MW, Grosset J, Linh PD, Tung LB, et al. Drug resistance among failure and relapse cases of tuberculosis: is the standard re-treatment regimen adequate? *International Journal of Tuberculosis and Lung Disease*, 2003, **7**(7):631-636.