Arch Public Health
2000, 58, 241-251

Recent trends in tuberculosis incidence in Belgium

by

Wanlin M°, Uydebrouck M*, Vermeire P*, Bartsch P°,
Schandevyl W*, Dierckx P°

Abstract

After decades of continuous decrease, tuberculosis incidence in Belgium slightly increased to a peak in 1994 (15.1/100,000) but it has slowed down again at an exponential rate during the subsequent years to 11.8/100,000 in 1998. However, in 1998 this favourable trend failed to occur in every region of the country. In the Brussels region the incidence reached 32.5/100,000 that year. In cities of more than 100,000 inhabitants TB-incidence is 2 1/2 -times higher than in smaller cities.

The most striking result of the registration is the high and still increasing proportion of non-Western subjects in the overall TB-incidence (24% in 1992 vs. 30% in 1998). Incidence is now 111/100,000 in the non-Western population (subjects from Eastern Europe, Asia (except Japan), Africa, Central and South America) vs 8.6/100,000 in the Western population.

Almost half of the pulmonary TB cases were smear positive and consequently contagious. Four percent of the patients were known to be

° FARES: Fondation contre les Affections Respiratoires et pour l'Education à la Santé.
* VRGT: Vlaamse Vereniging voor Respiratoire Gezondheidszorg en Tuberculosebestrijding.

co-infected with HIV, but the results of serological testing were known for only 13% of the subjects. Among the 1,203 new cases registered in 1998, 53 were of a low socio-economic status, 50 were asylum seekers, 40 illegals, 11 detainees.

Since 1992 the results of drug susceptibility testing have been analysed and related to clinical information. Until 1998 no more than 10 new cases of multiresistant TB per year were being detected, an incidence still below 0.1/100,000. In 1999, however, 18 new cases of MDR have been recorded, stressing a persistent need for maintaining close surveillance and screening of at risk groups.

Keywords

Tuberculosis – incidence – MDR - Belgium

Introduction

Drug resistant tuberculosis threatens efforts to control the disease even in Western countries. Surveillance of TB and especially of MDR** TB is absolutely necessary. This report describes the epidemiological situation of TB in Belgium, including the prevalence of resistance to the two most important drugs, in Belgian and non-Belgian TB patients during the period 1992-1998.

Methods

In Belgium every case of active tuberculosis has to be notified to the regional Ministry of Public Health. Since 1979, the Belgian Lung and Tuberculosis Association (BELTA) which links VRGT* and FARES°, the two organisations in charge of TB surveillance, analyzes the cases registered in the three regions of the country (Flanders, Brussels, Wallonia). From these data BELTA determines the yearly trend of the TB incidence in Belgium and identifies the groups at risk.

** MDR: mycobacterial resistance to at least isoniazid and rifampicin, the two basic drugs in antituberculous treatment.

In 1993 a Working Group on multidrug-resistant (MDR) tuberculosis was founded by representatives of BELTA, the two Belgian reference laboratories for mycobacterial analyses and the Federal Institute of Public Health responsible for quality control. Laboratories performing drug susceptibility testing were asked to send reports to BELTA three times a year. From 1992 to 1994 identification data (name, gender and day of birth) with results of susceptibility testing (INH-RMP) were reported retrospectively and were only known for MDR patients. Since 1995, information is collected prospectively and it is available for all patients with positive culture. On receipt BELTA first eliminates duplicates before analyzing the data; for MDR cases these are completed by information on nationality, previous treatment, HIV status, clinical data (mentioned in the TB-incidence register) and evolution.

Results

After decades of a persistent and exponential decrease, tuberculosis morbidity incidence in Belgium showed a slight upwards trend in 1993 and 1994 (to 14.9 and 15.1 for 100,000 inhabitants respectively), after which the decrease resumed at a similar rate as during the preceding years. In 1998 the number of registered new cases of active tuberculosis amounted to 1,203 (11.8/100,000) (fig. 1). This represents an excess of about 300 cases above the values that could have been expected from the trend observed during the eighties (1).

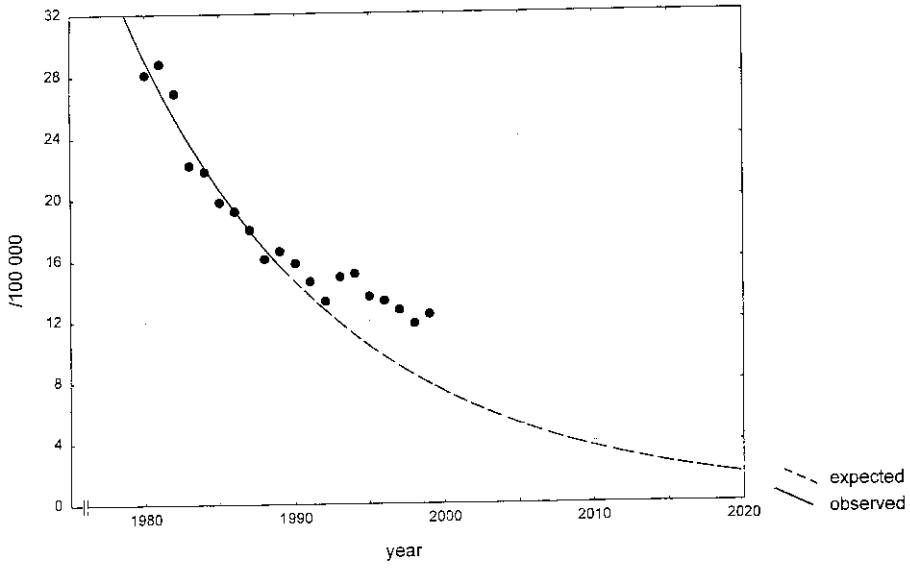

Fig. 1: TB-incidence in Belgium (1980-1998)

Tuberculosis incidence in Belgium varies between its regions. In the Brussels region 310 new cases were registered (32.5/100,000) (table 1) in 1998, a rate 3 to 4 times higher than in the Walloon and Flemish regions (fig. 2).

TABLE 1

New cases of tuberculosis and incidence (per 100.000) 1988-1998 in the 3 Belgian regions.

Year	Brussels		Wallonia		Flanders		Belgium	
1988	352	(36.3)	478	(14.9)	758	(13.3)	1,588	(16.1)
1989	369	(38.0)	527	(16.3)	752	(13.1)	1,648	(16.6)
1990	318	(33.0)	504	(15.5)	755	(13.2)	1,577	(15.8)
1991	334	(34.8)	475	(14.6)	653	(11.3)	1,462	(14.6)
1992	290	(30.5)	430	(13.1)	615	(10.6)	1,335	(13.3)
1993	346	(36.4)	436	(13.2)	721	(12.4)	1,503	(14.9)
1994	361	(38.0)	483	(14.6)	677	(11.6)	1,521	(15.1)
1995	332	(34.9)	418	(12.6)	630	(10.7)	1,380	(13.6)
1996	355	(37.4)	384	(11.6)	613	(10.4)	1,352	(13.3)
1997	347	(36.5)	388	(11.7)	554	(9.4)	1,289	(12.7)
1998	310	(32.5)	349	(10.5)	544	(9.2)	1,203	(11.8)

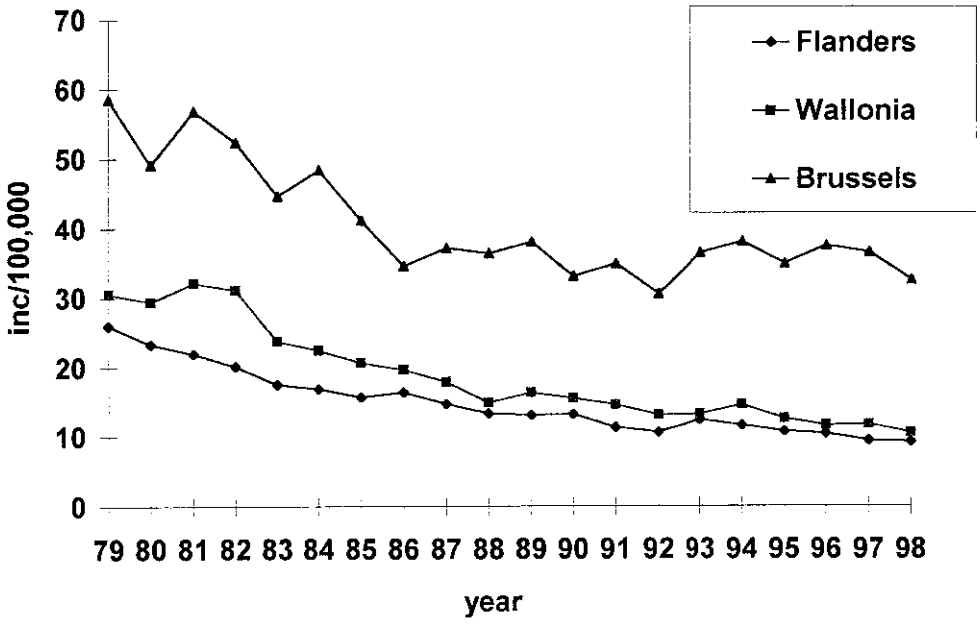

Fig. 2: Tuberculosis incidence in the 3 Belgian regions 1979-1998

In cities with more than 100,000 inhabitants the incidence is 2.5 times higher than in smaller municipalities: 23.1 vs. 8.6 in 1998 (table 2). Clearly, TB has become a disease of city dwellers, particularly of disadvantaged

TABLE 2
Tubercolosis incidence in Belgian cities 1998 (per 100.000 inh.)

	Belgians	Non-Belgians	Total
≥ 100.000 inhabitants	13.4	63.6	23.1
Smaller municipalities	7.1	32.3	8.6
Total	8.4	47.3	11.8

people. In the Brussels region the highest rate of tuberculosis incidence is found in those municipalities where a large part of the population has a low socio-economic status (SES) (fig. 3).

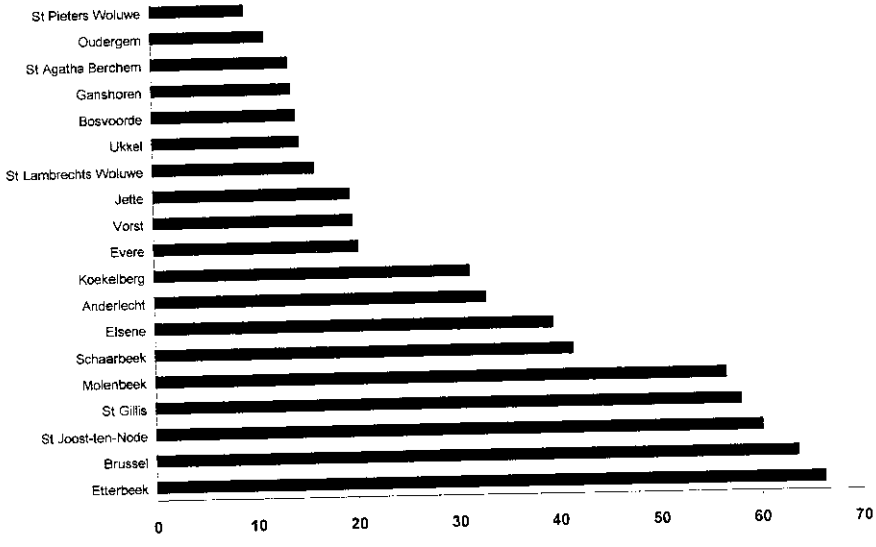

Fig. 3: Tuberculosis incidence (per 100.000) Brussels region 1994-1997

Among the 1,203 new cases registered in Belgium in 1998, there were 53 patients of low SES, 50 asylum-seekers, 40 illegally residing subjects and 11 detainees (table 3). Fifty one patients (i.e. 4% of the total

TABLE 3
Tuberculosis in groups at risk - Belgium 1998

	Belgians	Non-Belgians	Total
Detainees	2	9	11
Asylum-seekers	-	50	50
Illegal people	-	40	40
Disadvantages people	45	8	53
HIV positive*	12	39	51

* The result of HIV testing was known in only 13% of the registered cases.

incidence) were HIV co-infected, more than half of them were non-Belgians. However, the result of HIV testing was known in only 13% of the registered TB cases.

The most striking feature in recent years has been the increasing difference in tuberculosis incidence between Belgians and foreign-borns: in 1986 the incidence rate was 3 times higher in foreign-borns (44.9 vs. 16.2); in 1998 it was almost 6 times higher (47.3 vs. 8.4/100,000) (fig. 4). Particularly high is the incidence in citizens from high tuberculosis prevalence countries. In 1998 it amounted to 111/100,000 vs. 8.6/100,000 in both Belgian citizens and those from other low prevalence countries (table 4).

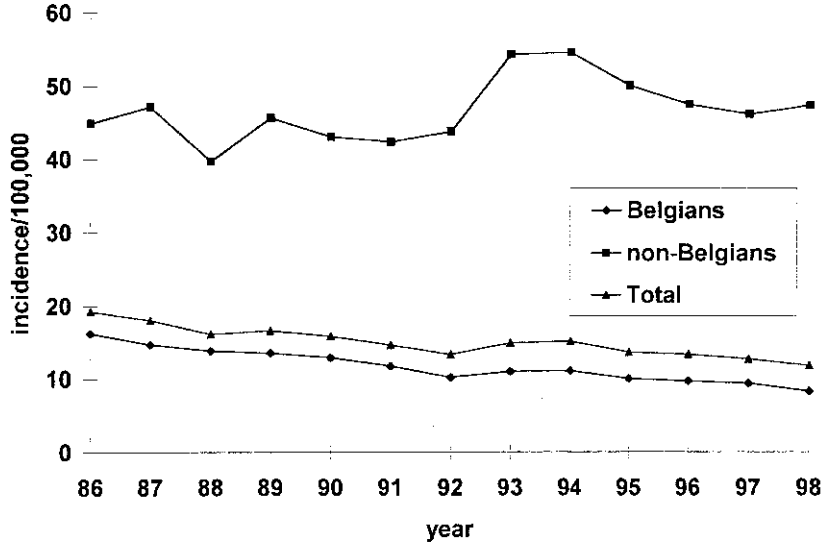

Fig. 4: Tuberculosis incidence in Belgians and non-Belgians (Belgium 1986-1998)

TABLE 4
Tuberculosis incidence (per 100.000 inh.) in Belgium (patients from high and low burden countries)

	1992	1993	1994	1995	1996	1997	1998
High-burden countries*	94.2 (323)	119.6 (416)	119.2 (419)	110.3 (385)	113.9 (381)	105.3 (348)	111.1 (354)
Low-burden countries (Belgium included)	10.4	11.1	11.2	10.2	9.9	9.6	8.6
Total incidence	13.3	14.9	15.1	13.6	13.3	12.7	11.8

( ) total number
* Asia (excl. Japan), Africa, Central and South America, Eastern Europe (incl. Turkey and USSR) Oceanië (excl. Australia and New Zealand)

Fig. 5 shows the TB incidence by age, gender and nationality in 1998. In Belgians, TB mainly affects aged subjects, especially males; in non-Belgians, younger people are affected as well.

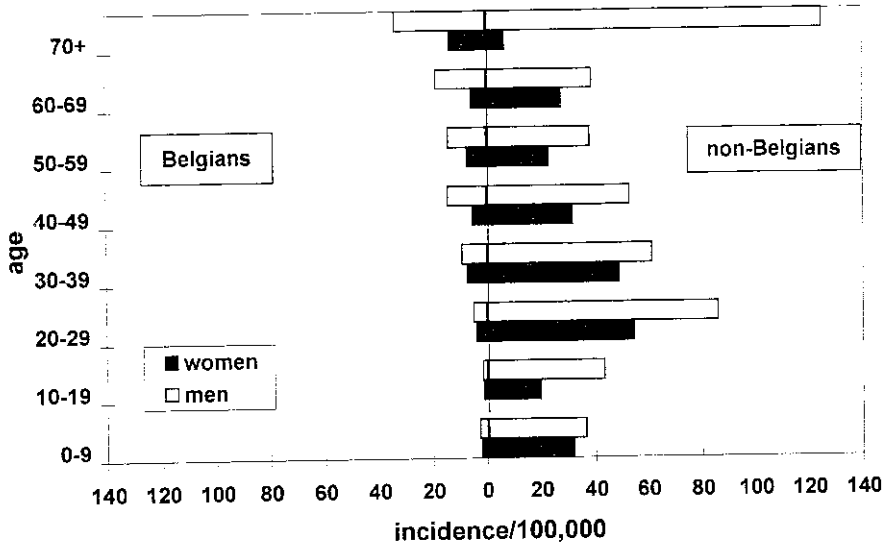

Fig. 5: Tuberculosis incidence by age, gender and nationality, Belgium 1998

Of utmost importance are the results of the bacteriological examination in pulmonary tb-patients, because smear positive ones (51% of the Belgian patients and 46% of the non-Belgians respectively) are the transmitters of the disease. In 1998 almost half of the 962 pulmonary cases registered were smear positive and consequently have to be considered as constituting a public health problem.

Since 1992, a mean of 8 new patients with MDR TB has been detected each year: this corresponds to an incidence as low as 0.1/100,000 (table 5).

TABLE 5

Multidrug resistant tuberculosis in Belgium 1992-1998.

Year	Number of patients with positive culture	MR cases	% MR cases	New MR cases	Incidence /100.000 inh.
1992	1.290	15	1.2	10	0.1
1993	1.266	17	1.3	10	0.1
1994	1.168	11	0.9	6	0.06
1995	832 (763)	9	1.1 (1.2)	4	0.04
1996	823 (750)	9	1.1 (1.2)	4	0.04
1997	841 (791)	16	1.9 (2)	11	0.1
1998	870 (834)	14	1.6 (1.7)	6	0.06

( ) number tested for susceptibility

However, preliminary reports of 18 new cases in 1999 may indicate an impending increase. Seventy one percent of the 55 MDR-TB cases, reported between 1992 and 1998, are men; 58% are younger than 35 years and 73% are foreign-born (table 6), 31% are asylum seekers or illegal residents. In only 26 of the 55 MDR patients the HIV-status is known; in 3 of them the test was positive.

TABLE 6
Multidrug resistant tuberculosis in Belgium 1992-1998.

Feature	Percentage (number)
Gender	
Men	71 (39)
Women	29 (16)
Age	
15-24 years	56 (31)
Nationality	
Belgium	27 (15)
Central Africa	17 (9)
North Africa	24 (13)
Eastern Europe	(4)
Asia	(3)
South America	(1)
Europe (Turkey and Italy)	18 (10)
HIV-status	
positive	3
negative	23
unknown	29
Tuberculosis antecedents	
never treated	27 (15)
treated	56 (31)
unknown	16 (9)

In 15 patients (27%) the MDR was of the primary type. Having never been treated before, these patients had been contaminated by a patient with resistant bacilli. For 6 of them the index case was known, in 4 this was confirmed by genotyping. Four cases were contaminated inside the family, one was in the neighbourhood and one in the hospital. In 31 patients (56%) treated before, the development of secondary resistance was mainly due to poor compliance.

From the 55 MDR-TB cases reported since 1992, 8 patients had died (15%) by the end of 1999, 4 (7%) had left the country, 26 (47%) had finished

their treatment and 10 (18%) were still under treatment; 2 of them still being smear positive after 7 and 6 years respectively. The latter group constitutes a real public health problem and so do the 7 MDR patients who were lost for follow-up.

Discussion

WHO considers that a tuberculosis incidence of 10/100,000 opens the perspective of TB eradication within the next decades. With an incidence of 11.8 in 1998, TB no longer seems to constitute a major public health problem in Belgium. Nevertheless the higher rate in at-risk groups (disadvantaged people, asylum seekers, detainees) and in larger cities justifies close and continuous vigilance.

The rising incidence resulting from both the deteriorating health provision in East European countries, particularly in the former Soviet-Union (notification rates up to 106/100,000 in 1997) (2,3), and increasing intercontinental travelling (4), are a threat to Western countries (5), where incidence has declined to below 20/100,000 (6). The curbing of the severe MDR TB epidemics, occurring in the USA in 1988-1991, after Directly Observed Treatment (DOT) had been introduced, has proven the importance of close TB surveillance and the need to maintain efficient TB control systems (7). Until 1998 the registration of MDR in Belgium, which was set up in 1993, had shown an average of 8 new cases per year, an incidence still below 0.1/100,000. This incidence corresponds to a rate of 0.9 – 1.9% MDR cases among the total number of culture positive cases and it is comparable to the situation in other Western countries in recent years: 0.6% in France (8); 1% in the Netherlands (9); 2.2% in USA (10) and 0.6 1.7% in UK (11). In 1999, however, some 18 new cases of MDR TB have been notified in Belgium, which is doubling the average number of 8 per year registered before. Finally, treating MDR patients (with so called minor or secondary drugs) is a difficult and problematic task, resulting in some patients still being smear positive after several years of treatment.

In conclusion, yearly registration of new cases and particularly of MDR cases must be continued on both national and European levels. Screening of groups at risk and strict surveillance of adherence to recommended therapy by 'Directly Observed Treatment' (DOT) have to be maintained. Neglecting this policy could result in MDR becoming a 'genuine millennium bug'.

Samenvatting

Na jaren van blijvende daling is de tuberculose-incidentie in België lichtjes gestegen in 1994 (15.1/100,000) om nadien verder op exponentiële wijze te dalen tot 11.8/100,000 in 1998.

Niettemin is er een duidelijk onderscheid in incidentie in de verschillende gewesten. In het Brussels Hoofdstedelijk Gewest bereikt de incidentie 32.5/100,000 in 1998. In steden met meer dan 100,000 inwoners is de incidentie 2.5 maal hoger dan in kleinere gemeenten. Het meest opvallende in het tuberculoseregister is het toenemend aandeel van de niet-Westerse populatie; 24% in 1992 vs 30% in 1998.

De incidentie in deze populatie (afkomstig van Oost-Europa, Azië excl. Japan, Afrika, Latijns-Amerika) bedraagt 111/100,000 vs 8.6/100,000 in de Westerse populatie (Belgen inbegrepen). Ongeveer de helft van de pulmonale vormen van tuberculose is positief bij microscopisch onderzoek en bijgevolg besmettelijk. 4% van de patiënten is eveneens besmet met het HIV maar het resultaat van de serologische test is slechts in 13% van de patiënten gekend.

Bij de 1,203 gevallen van actieve tuberculose in 1998 geregistreerd zijn er 53 patiënten met een lage socio-economische status, 30 asielzoekers, 40 illegalen, 11 gedetineerden.

De resultaten van de gevoeligheidstests voor de twee belangrijkste tuberculostatica worden sinds 1992 geregistreerd en gecorreleerd met klinische gegevens. Tot in 1998 werden er gemiddeld niet meer dan 10 gevallen van MR geregistreerd per jaar (incidentie < 0.1/100,000). In 1999 werden echter 18 gevallen van MR vastgesteld. Een blijvende monitoring en opvolging van groepen met verhoogd risico op tuberculose is dan ook absoluut noodzakelijk.

Résumé

Alors que l'incidence de la tuberculose diminuait régulièrement en Belgique depuis plusieurs dizaines d'années, une augmentation de celle-ci a été enregistrée début 1990. Elle a atteint un pic de 15.1/100,000 en 1994, puis a ensuite réamorcé sa lente régression. Cette évolution favorable ne se retrouve pas dans chaque région du pays. A Bruxelles plus particulièrement, l'incidence est élevée et atteint 32.5/100,000 en 1998. En général, dans les villes de plus de 100,000 habitants, l'incidence est 2.5 fois plus élevée que dans les petites communes.

Ces dernières années, le résultat le plus frappant dans le registre de la tuberculose, est la proportion croissante de sujets provenant de pays à haute prévalence de tuberculose (24 % en 1992 versus 30 % en 1998). Actuellement, l'incidence dans ce groupe originaire d'Asie (à l'exclusion du Japon), d'Europe de l'Est, d'Afrique, d'Amérique Centrale et du Sud est de 111/100,000 alors que chez les sujets issus de pays à basse prévalence elle n'est que de 8.6/100,000.

A peu près la moitié des tuberculoses pulmonaires sont positives à l'examen direct et sont donc contagieuses. Quatre pourcents des patients tuberculeux sont aussi infectés par le VIH, mais le résultat sérologique n'est connu que chez 13 % d'entre eux. Parmi les

1,203 cas de tuberculose active enregistrés en 1998, on dénombre 53 sujets issus du quart-monde, 50 candidats réfugiés, 40 illégaux et 11 détenus.

Les résultats des tests de sensibilité concernant les deux médicaments antituberculeux majeurs (l'isoniazide et la rifampicine) ont été enregistrés depuis 1992. Jusqu'en 1998, moins de 10 nouveaux cas de tuberculose multirésistante ont été détectés annuellement (incidence 0.1/100,000). Cependant, en 1999, 18 nouveaux cas multirésistants ont été notifiés. La vigilance est donc de mise et le maintien de l'enregistrement des cas, du dépistage et du suivi régulier des groupes à risque s'impose.

References

1. Tuberculoseregister België (VRGT rapporten) - Registre de la tuberculose en Belgique (documents FARES).
2. RAVIGLIONE MC, RIEDER HL, STYBLO K, KHOMENKO AG, ESTEVES K, KOCHI A. Tuberculosis trends in Eastern Europe and the former USSR. Tubercle and Lung Disease 1994; 75: 400-416.
3. Surveillance of tuberculosis in Europe. Report on tuberculosis cases notified in 1997. CESES/KNCV 1999.
4. RIEDER HL. Epidemiology of tuberculosis in Europe. Eur Respir J 1995; Suppl 20: 620-632.
5. Tuberculosis – secular trends of tuberculosis in Western Europe. WHO Weekly Epidemiological Record 1993; 68: 65-72.
6. RIEDER HL, WATSON JM, RAVIGLIONE MC, FORSSBOHM M, MIGLIORI GB, SCHWOEBEL V, LEITCH AG, ZELLWEGER JP. Surveillance of tuberculosis in Europe. Eur Respir Journal 1996; 9: 1097-1104.
7. FRIEDEN TR, FUJIWARA PI, WASHKO RM, HAMBURG MA. Tuberculosis in New York city – turning the tide. New Engl J Medicine 1995; 333: 229-233.
8. GROSSET J, TRYSTAM D, DE BENOIST AC, SCHWOEBEL V, VINCENT V, GUTTIERREZ MC, TRUFFOT-PERNOT C, ROBERT J. La tuberculose à bacilles multirésistants en France en 1995. Bulletin épidémiologique hebdomadaire 1998;13: 53-54.
9. LAMBREGTS-VAN WEZEMBEEK C, JANSEN H, NAGELKERKE N, VAN KLINGEREN B, VEEN J. Nationwide surveillance of drug-resistant tuberculosis in the Netherlands: rates, risk factors and treatment outcome. Int J Tuberc Lung Dis 1998; 2: 288-295.
10. MOORE M, ONORATO I, MCCRAY E, CASTRO K. Trends in drug-resistant tuberculosis in the United States, 1993-1996. JAMA 1997; 278: 833-837.
11. SCHWOEBEL V, LAMBREGTS-VAN WEZEMBEEK C, MORO ML, DROBNIEWSKI F, HOFFNER S, RAVIGLIONE MC, RIEDER HL. Standardisation of antituberculosis drug-resistance surveillance in Europe. Recommendations of a WHO and IUATLD Working Group. Version 1999. Eur Resp J 2000; 16: 364-371.
12. BUSTREO F, MIGLIORI GB, NARDINI S, RAVIGLIONE MC. Antituberculosis drug-resistance: is it worth measuring? The WHO/IUATLD Working Group on Antituberculosis drug resistance surveillance. Monaldi Arch Chest Dis 1996; 51: 299-302.
13. RAVIGLIONE MC, SUDRE P, RIEDER HL, SPINACI S, KOCHI A. Secular trends of tuberculosis in Western Europe. WHO Bull 1993; 71: 297-306.
14. DYE CHR, GARNETT GP, SLEEMAN K, WILLIAMS BG. Prospects for worldwide tuberculosis control under the WHO DOTS strategy. Lancet 1998; 352: 1886-1891.