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Epidemiology of Tuberculosis (TB) in Albania 1998-2009

Elida Mataj[1], Agim Shehi[1], Genci Dervishi[1], Samira Mataj[2]
[1]*Institute of Public Health, Tirana, Albania*
[2] *Bio-Chemical Laboratories, Polyclinic No.7, Tirana, Albania*

Abstract : *In Albania, many people erroneously think that tuberculosis (TB) is a disease of the past-an illness that no longer constitutes a public health threat. Surveillance is an integral part of tuberculosis (TB) control. Albania has a highTB notification rate and there are doubts about underreporting. The evolution of the incidence of tuberculosis is presented, together with more detailed figures over the period 1998-2009. These figures were obtained by the monthly forms (called 14/Sh) compared with the individual notification data. Objective: To examine the distribution and sources of increased tuberculosis (TB) morbidity and reporting system deficiencies in the Albania from 1998 through 2009. Metodology: The study is descriptive one conductet during the period 1998-2009. The statistical analysis is based on data reported from regional level (regional epidemiological departments) to the central level (Public Health Institute). Results: The main findings were: discordance between the collected data (individual form) and reported data (monthly form); tuberculosis incidence rate shows little oscillations which ranges from 6.67 to 9.2 cases/100.000 population; 50% of the regions show a lack of information on the confirmation of diagnosis and laboratory examination type used for confirmation. Conclusion: TB disease in high-risk populations where it is difficult to detect, diagnose, and treat; limitations of current control measures and the need for new tests and treatments, including an effective vaccine; improving information system, regulation of individual form and personnel training.*

Key words: *Tuberculosis, information system, examination tests*

I. Introduction

Tuberculosis (TB) is a major global public health concern[1] and surveillance is an integral part of any TB control plan[2, 3] including the Directly Observed Treatment Short-course (DOTS) framework[4]. Mandatory notification of cases is the basis of TB surveillance system, which can be affected by underreporting.

As a result, notification rates not accurately reflect TB incidence and comparisons between countries become less straightforward. In Albania, TB has been a notifiable disease since 1950 and the notification rate is currently one of the lowest in Europe[5].

TB represents a growing global health threat, particularly due to its link with HIV/AIDS.

In the Albanian surveillance system, physicians and/or laboratories are obliged to report TB cases at the time of diagnosis. A notification form is sent to either the Public Health Directorate of the local level; who is responsible for local public health action, such as TB contact tracing and monitors TB epidemiology and trends at the national level. Cases (new or recurrent) are notified at the time of diagnosis, and are classified as "suscepted", and "confirmed" according to the WHO case definition[6].

Despite measures taken by Ministry of Health, TB prevention systems are poor. There is a lack of proper method for diagnosis, lack of information about patient treatment, and poor communication between responsible medical centers namely TB dispensaries and epidemiological services at the district level[7].

In 1995, the National Program (DOTS) for the fight against TB sponsored by ECHO/WHO, MERILIN and IMC started in Albania. During the implementation of this program found that only 69 percent of newborns received a BCG injection within 48 hours after birth in some districts.

II. Objective

The primary objective of the current study was to estimate underreporting and incidence of TB in Albania (corrected for underreporting) for the period 2007–2009, by comparing monthly surveillance data with notifiable data.

Secondary objectives of the study were to estimate annual trends in underreporting and TB incidence during the period 1998-2009.

III. Methods

We focused on the TB cases notified over the period 2007-2009 and monthly reporting case as part of routine surveillance between 1998 to 2009. Comparative analysis between the data of infectious diseases surveillance is based on the data by monthly reporting and by individual notification form. Monthly information system of

infectious diseases surveillance (14/Sh monthly reporting) is based on aggregated data obtained from individual patient forms. The statistical analysis and the elaboration are presented by graphs and tables (through the use of Excel and the Epi-2002 software). The analysis was based on general information related to the total number of cases from monthly reporting system, in order to describe the trends and key variables of infectious diseases under the study, and the data reported by the individual notification forms, so that makes an assessment of the system through cross-analysis of data.

IV. Results

The results show significantly quantitative and qualitative deficiencies of the existing monthly reporting form (14/Sh) compared with data derived from individual files of notification of this group of diseases. Tubercular disease in this form are only reported as pulmonary tuberculosis (ICD-9 - 010), creating gaps in the knowledge of the frequency of other tuberculosis forms.

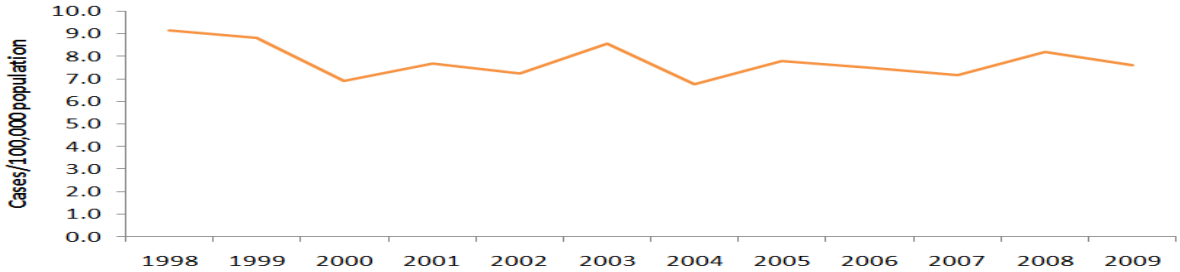
Table.1 shows discordance between the number of notified individual cases by hospitals and those reported by epidemiologist locally (2007-2009).

Table .1 Number of pulmonary tuberculosis cases in Albania [by monthly reporting and by individual schedules ( )]

Disease	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Pulmonary TBC	281	271	212	236	223	263	208	239	230	220 (149)	**252** (150)	234(117)

** ( ) the data from individual form*

Figure 1 The incidence rate of pulmonary tuberculosis over the period 1998-2009 in Albania



The occurrence levels of tuberculosis in Albania have remained nearly constant over the study period. The annual cases vary in a range from 208 to 281 ones, with an incidence rate that vary from 6.67 to 9.2 cases/100.000 population. As seen, the figure.1 shows a little oscillations of trend.

Table .2 Number of pylmonary tuberculosis cases by monthly and individual form ( ) by regions during the years 2007-2009

Regions	Number cases reported by monthly form and individual form ( ) for Pulmonary tuberculosis
Berat	6
Diber	54 (32)
Durres	50 **(54)**
Elbasan	51
Fier	66 (1)
Gjirokaster	3
Korce	22
Lezhe	45 (42)
Tirane	291 (249)
Shkoder	70
Kukes	13
Vlore	35 **(39)**

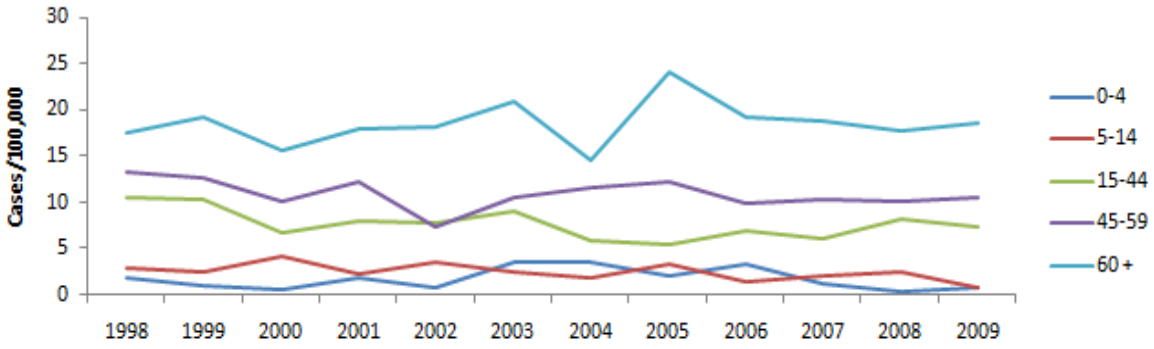
The table. 2 show that 5 out of 12 regions of the country have not completed the individual notification form for pulmonary tuberculosis, casting doubts over the quality and authenticity of data. Also, Durres and Vlora districts represent more of notified cases from those reported through monthly reporting as aggregated data

Distribution of Pulmonary TBC over the period 1998 – 2009 by region
Country Mean Incidence (cases/100,000 population) and range
Pulmonary TBC
7.0 (1.0 – 15.8)

Table .3 Number of pulmonary tuberculosis cases over the period 1998-2009 by age - group

Disease		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
		no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases
Pulmonary tuberculosis	0-4	5	3	2	5	2	9	9	5	8	3	1	2
	5-14	18	15	26	13	22	14	10	19	7	11	13	4
	15-44	146	141	93	110	108	129	85	79	101	89	124	109
	45-59	72	68	55	67	48	60	67	73	61	65	64	67
	60+	40	44	36	41	43	51	37	63	53	52	50	52

Figure. 2 The incidence rate of pulmonary tuberculosis over the period 1998-2009 by age - group

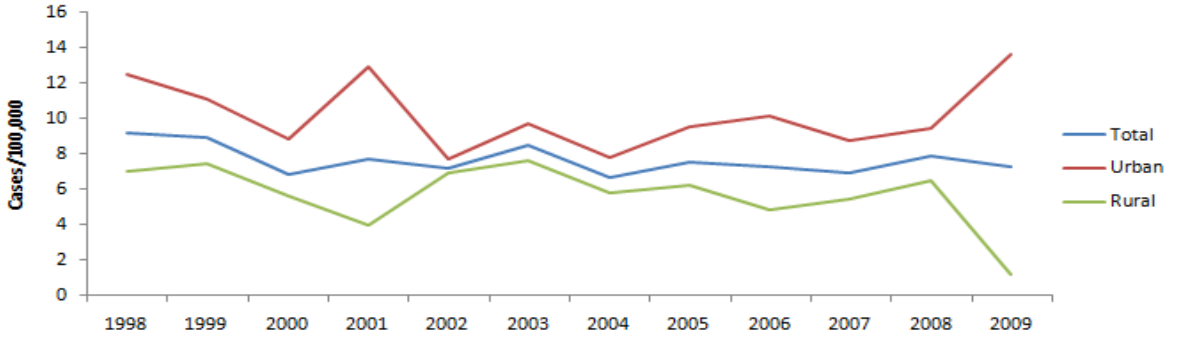


The major burden is occupied from the adult age (over 25 old years). Specifically, age 15-44 years represent 45.8% of cases, 45-59 years about 26.7 % of them and 60+ years old represent 19.6 % of cases with pylmonary tuberculosis (see table. 3).
The incidence rate shows oscillations of trend for all age groups. The higher incidence rate is for age 60+ followed by 45 -59 years and 15 – 44 years old.

Table . 4 Number of pulmonary tuberculosis cases over the period 1998-2009 by residence

Disease		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
		no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases
Pulmonary tuberculosis	Total	281	271	212	236	223	263	208	239	230	220	252	234
	Urban	153	137	111	165	100	130	107	132	152	134	147	214
	Rural	128	134	101	71	123	133	101	107	78	86	105	20

Figure. 3 The incidence rate of pulmonary tuberculosis over the period 1998-2009 by residence

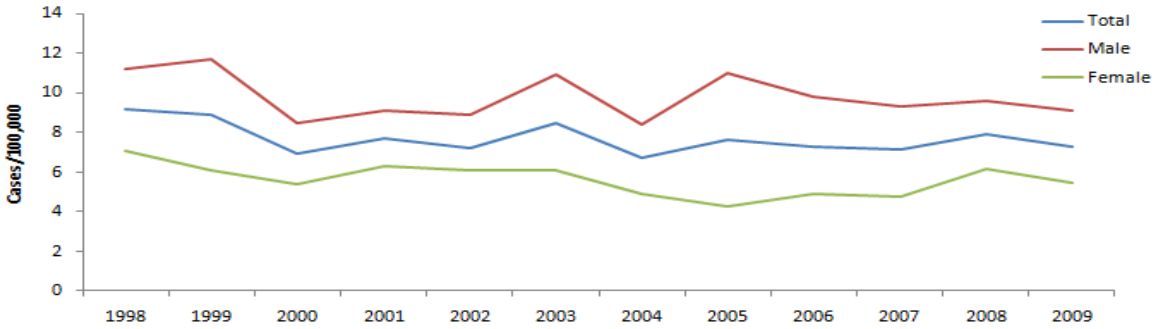


Regarding the distribution by areas of the pulmonary tuberculosis (cases number and the incidence rate) in 58.6% of cases are of urban areas (see table. 4), and the figure. 3 represent increasing trend for urban cases and decreasing trend for rural cases.

Table . 5 Number of pulmonary tuberculosis cases over the period 1998-2009 by gender

Disease		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
		no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases
Pulmonary tuberculosis	Total	281	271	212	236	223	263	208	239	230	220	252	234
	Male	174	179	130	139	136	169	131	172	153	146	154	146
	Female	107	92	82	97	87	94	77	67	77	74	98	88

Figure. 4 The incidence rate of pulmonary tuberculosis over the period 1998-2009 by gender



Distribution by gender shows that the highest incidence rate and the number of cases are males; expressed in percentage they constitute 63.2% of cases of pulmonary tuberculosis. The ratio male / female is 1.7/1.5 respectively see table 5 and figure 4.

Individual notification schedul of pulmonary diseases

Individual form of pulmonary tuberculosis notification contains three parts.
First part - Vital records on the case and the onset of the diseases
Second part - Clinical and epidemiological investigation
Third part - Microbiological laboratory diagnosis

First part – "Vital records on the case and the onset of the diseases"

The difference between the date of onset of symptoms, hospital admission date, date of hospitalization and date of starting of therapy was calculated as follows:
Time lag (days): median & range

- Date of onset to Date of hospital admission **12 (0 – 160)**
  Kolmogorov-Smirnov test for Normal distribution P<0001- Normality rejected
- Date of hospital admission to Date of starting therapy **0 (0 – 66)**
  Kolmogorov-Smirnov test for Normal distribution P<0001- Normality rejected

This calculation is based on the median as a result of abnormal distribution of data
Other indicators of the first part of the individual notification form also included information on vaccination, the patient is exposed to TB or not and case classification.
From the obtained results show that in 417 cases, 247 of them (59.2% of cases) have a lack of information on vaccination. The frequency of "blank" is higher than others as: vaccinated, unvaccinated and unknown.
Table. 6 the vital records and onset of diseases

	Yes		Blank	
	No.	**%**	**No.**	**%**
Father's name	227	54.4	190	45.6
Address	417	100	0	0
Profession	347	83.2	70	16.8
Date of onset	334	80.1	83	19.9
Date of hospital admission	309	74.1	108	25.9
Date of starting therapy	327	78.4	90	21.6

Second part – "Clinical and Epidemiological Investigation"

The second part of the form contains risk factors (alcohol and intravenous drug users), classification of the case, radiological and intra dermo reaction examinations and spread of the disease (sporadic or endemic). Table.7 shows that in 417 patients, 11 of them (2.6%) are users of intravenous drugs and alcohol.

Table. 7 Frequency of patients, users of alcohol and intravenous drugs

Intravenous drugs (narcotic)	Alcoholism				Total
	Blank	No	Unknown	Yes	
Blank	43	21	1	10	75
Unknown	0	0	6	0	6
No	0	228	7	85	320
Yes	0	4	1	11	16
Total	43	253	15	106	417

Regarding exposure of 417 cases, 298 of them (71.5%) were not exposed to TB patients. 85.6% of them were new cases (357/417).

Table. 8 Frequency of radiography and intradermoreaction examinations

Intradermo reaction	Radiography examination				Total
	Blank	Not done	Negative	Positive	
Blank	71	3	17	52	143
Not done	0	3	0	10	13
Negative	4	9	35	29	77
Positive	9	8	50	117	184
Total	84	23	102	208	417

The table.8 shows that 117 (28.1%) of patients with positive results have also conducted two examinations (radiological and intradermoreaction) and in 12% of forms we have "blank" regarding the laboratory examination type. Also, epidemiological investigation of cases shows that in 240 forms (57.6%), the extent of infection is "blank" (must to be: sporadic or endemic case).

Third part – "Microbiological laboratory diagnosis data"

Case definition and confirmation of pulmonary tuberculosis was determined by laboratory examinations such as direct examination, culture and serology.

The following tables present the cases number which have committed directly, culture examinations and serology.

Table. 9 Frequency of laboratory results (direct and cultura examination)

	Result Direct			Total
	Blank	NEGATIVE	POSITIVE	
Result Culture				
Blank	92	48	49	189
NEGATIVE	8	5	1	1
POSITIVE	195	1	**18**	214
Total	295	54	68	417

In 18 cases (expressed in 4.3% of them) positivity was confirmed by direct and culture examination (see table. 9). 22.1% of cases represent "missing" for direct and culture examination.

Table. 10 Frequency of laboratory results (direct and serology examination)

	Result Direct			Total
	Blank	NEGATIVE	POSITIVE	
Result Serology				
Blank	294	53	66	413
POSITIVE	1	1	**2**	4
Total	295	54	68	417

In 2 cases (expressed in 0.5% of them) positivity was confirmed by direct examination and serology (see table. 10). 70.5% of them are "missing" for direct examination and serology.

Table. 11Frequency of laboratory results (serology and cultura examination)

	Result Culture			Total
	Blank	**NEGATIVE**	**POSITIVE**	
Result Serology				
Blank	186	14	213	413
POSITIVE	3	0	**1**	4
Total	189	14	214	417

In 1 case (0.2%) positivity was confirmed by three examinations (see table. 11).
44.6% of cases have "missing" for culture and serology.

V. Discussion

The incidence rate of ***pulmonary tuberculosis*** in Albania (7.1 per 100.000) is presented in smaller value than that of the EU countries (17.1 per 100.000) and slightly higher than Greece (5.9 per 100.000)[8], this is because the organization and implementation of all obligations by the WHO for the fight against pulmonary tuberculosis as implementing the program DOTS. The obtained results from the information system clearly showed a large discrepancy between the monthly information and individual cases (where the number of cases should be equal). This inconsistency and discordance is due to: lack of qualified personnel in public health services; lack of periodic analysis of epidemiological service activity (central level – IPH) related to discrepancy between notified and monthly reported data. The epidemiological service at the central level does not take correct measures in order to reduce or eliminate this gap; lack of communication between hospital institutions and public health structures; migration of population that makes impossible the individual form compilation; there is an inappropriate level of laboratory confirmation of disease, because of the inadequate level of performance of microbiological laboratories in regional level.

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