

Evaluation of surveillance system of diarrheal diseases during 1998-2009 in Albania

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ABSTRACT: Reporting of infectious diseases in Albania is based on monthly reporting of cases through 14/Sh form. The data flow is carried out from local level (districts) to central level (IPH). In 1998, the surveillance system were carried out changes which are needed to improve the information available to health care providers. **Objective:** Assessment of the surveillance system to identify strengths and its limitations and to make appropriate recommendations on improvements. **Methods:** The study were descriptive one. In the study were included reported data by monthly form during the period 1998-2009 and notified individual form during the period 2007-2009, it to see the authenticity of the reported data and to know the situation regarding the level of health risks. The study was conducted in 12 major districts. **Results:** Obtained results showed the discordance between the individual information generated by the hospitals and laboratories and monthly information generated by reporting units.

This surveillance system is represented by the low quality data which is expressed through incomplete, inaccurate and slow data. **Conclusion:** Need for standardization of the system with the standard required by ECDC.

KEY WORDS: surveillance system, infection diseases, diarrhea diseases, data reporting

I. INTRODUCTION

The Surveillance data are required for planning disease control activities and evaluating the impact. Disease surveillance data are also required to identify high-risk areas and high-risk groups for providing special attention¹. However, like in most developing countries, health information system in most parts of Albania lacks the capacity to provide timely information on health events requiring prompt action². The National Program of Surveillance of Communicable Diseases (14/Sh) began functioning at 50' years; the burden of infectious diseases continues to be high compared with the European countries. We have evaluated the Diarrheal Diseases Surveillance System in Albania with the objective of describing and identifying of the weak points and constraints; and based upon the findings we have suggested appropriate measure to sustain strengths and overcome constraints³.

II. MATERIAL AND METHODS

The evaluation of surveillance system of diarrheal diseases was shared such as (1) objective of surveillance evaluation (2) methodology to be adopted for the surveillance evaluation (3) disease to be evaluated (4) data collection methods (5) data analysis (6) dissemination of results⁴.

The study were descriptive one. In this study were included 12 major districts.

Identified diseases as an epidemic potential were listed as: (1) Typhoid Fever (2) Salmonellosis (non-typhoid) (3) Shigellosis (bacillary dysentery) (4) Poisoning and (5) Amoebiasis. The objectives of the surveillance system for these diseases were included identifying core diseases like acute diarrheal diseases, estimating the disease burden, suggesting the trends of the disease, and analysis⁵. Reporting forms containing identifying variables such as age, sex, geographic area, date of onset, laboratory results etc... (see annex 1)⁶. We assessed the simplicity through a review and analysis of data flow to see the possibility of obtaining the same results from both forms of reporting (individual and monthly). We assessed data quality by examining the percentage of "unknown" or "blank" responses to items on the surveillance forms. We reviewed diarrheal surveillance records to estimate the timeline for reporting. We qualitatively evaluated the surveillance system's ability to add new components and the ability to be operational when needed (flexibility)⁷.

III. RESULTS

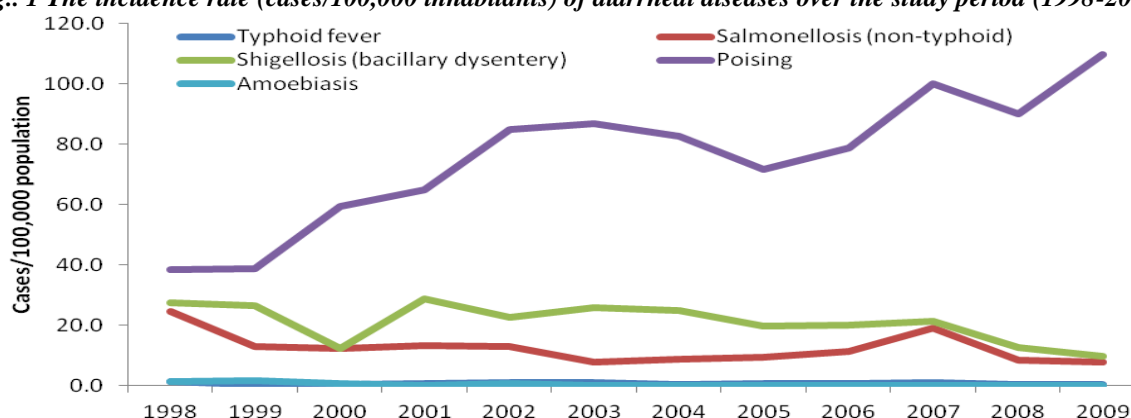
Table 1 shows the discordance between the data (monthly reporting and individual) expressing a major gap in the system of surveillance of infectious diseases in Albania.

Table.1 Number of cases of diarrhealdiseases in Albania [reported by monthly and individual form ()]

Disease	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Typhoid fever	41	13	15	21	30	29	13	19	22	29 (16)	8 (4)	11 (7)
Salmonellosis (non-typhoid)	757	395	380	407	401	242	270	294	352	584 (133)	257 (69)	241 (61)
Shigellosis (bacillary dysentery)	848	817	728	885	694	795	764	607	614	652 (170)	390 (87)	300 (60)
Poising	1176	1186	1826	1987	2601	2665	2536	2200	2415	3067 (58)	2764 (57)	3370 (70)
Amoebiasis	45	49	20	4	24	4	5	7	6	0 (4)	6 (6)	0

() =included individual cases

Fig. 1 The incidence rate (cases/100,000 inhabitants) of diarrheal diseases over the study period (1998-2009)



The annual incidence rate of diarrheal diseases during the period 1998 - 2009, shows the decreased trend for each disease presented in figure.1 except the incidence rate of poising which is higher than the other diarrheal diseases and is increased from 40.0 to 120.0 cases/100.000 population.

Table. 2 Number of diarrheal diseases case reported by monthly and individual form () by regions during the years 2007-2009

Districts	Typhoid fever	Salmonellosis (non-typhoid)	Shigellosis (bacillary dysentery)	Poisoning	Amoebiasis
Berat	1 (2)	54 (39)	157 (107)	1514	1 (4)
Diber	2	5 (4)	5 (5)	1003	0
Durres	3 (5)	3 (1)	48 (3)	84	0
Elbasan	9 (9)	107 (2)	100 (5)	84 (80)	0 (6)
Fier	1	6 (5)	16 (2)	138 (4)	0
Gjirokaster	0	0	4 (3)	10 (7)	0
Korce	2	13 (7)	90 (78)	144	6 (0)
Lezhe	1	68 (58)	28 (30)	0	0
Tirane	23 (11)	231 (132)	170 (42)	105 (87)	0
Shkoder	0	523	618	0	0
Kukes	4	60	76	6111	0
Vlore	2	10	30	8	5
Total	48 (27)	1080 (248)	1342 (275)	9201 (178)	12 (10)

() =included individual cases

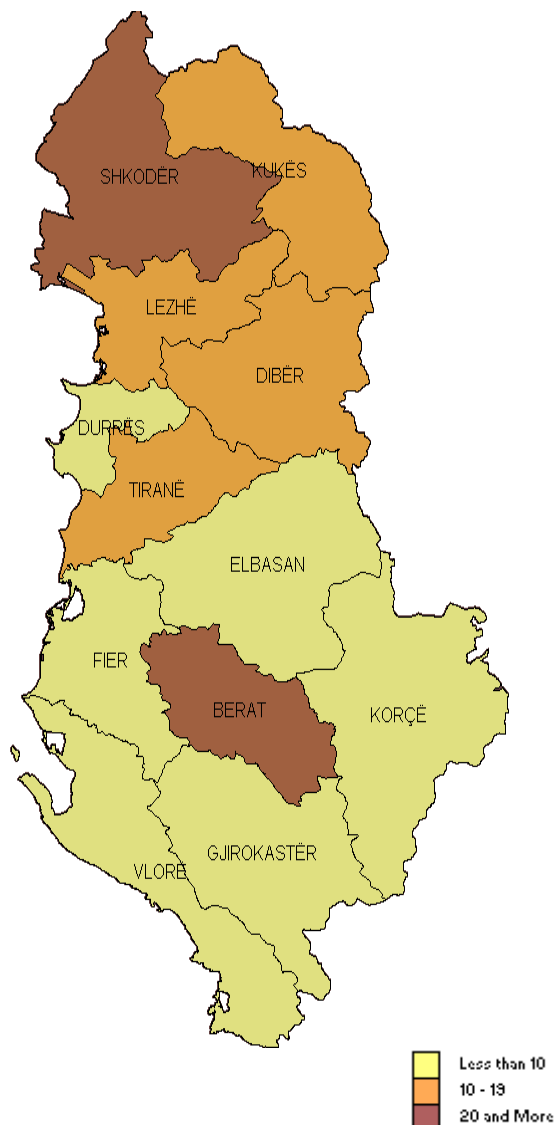
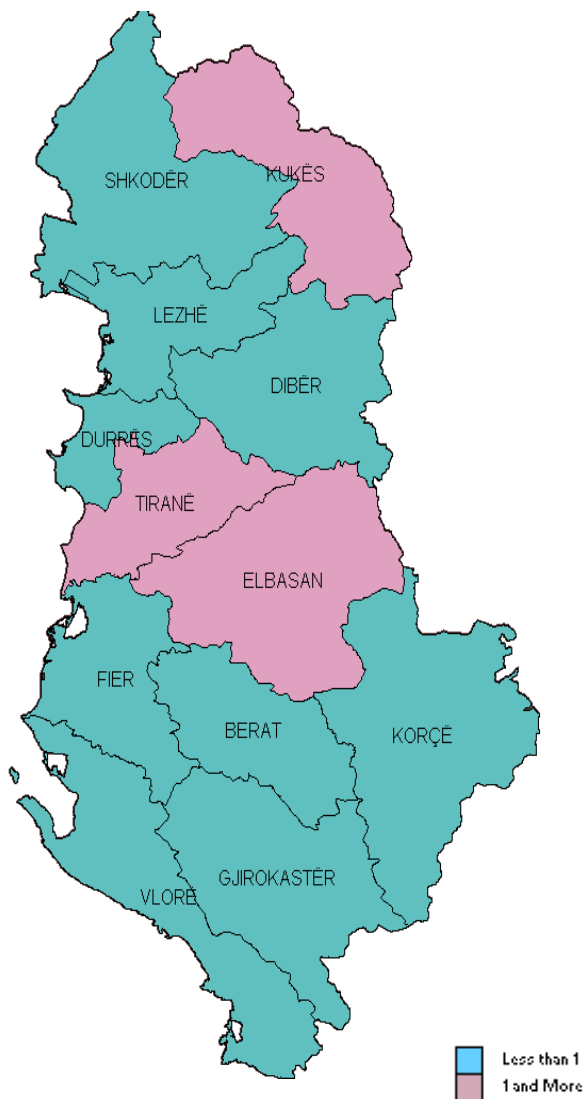
The table 2 presents number of diarrheal diseases cases by regions reported by monthly and individual form over the period 2007-2009. It's evident a discordance between the number of notified cases with the total case number reported by monthly form.

50 % of districts have reported only the number of cases by monthly reporting form (14/Sh); 33% of them have presented monthly and individual data. As shown in the table above, some of districts represent more data by individual notification form than monthly data such as: Berat and Durrës for typhoid fever; Lezhe for shigellosis; and Berat and Elbasan for amoebiasis.

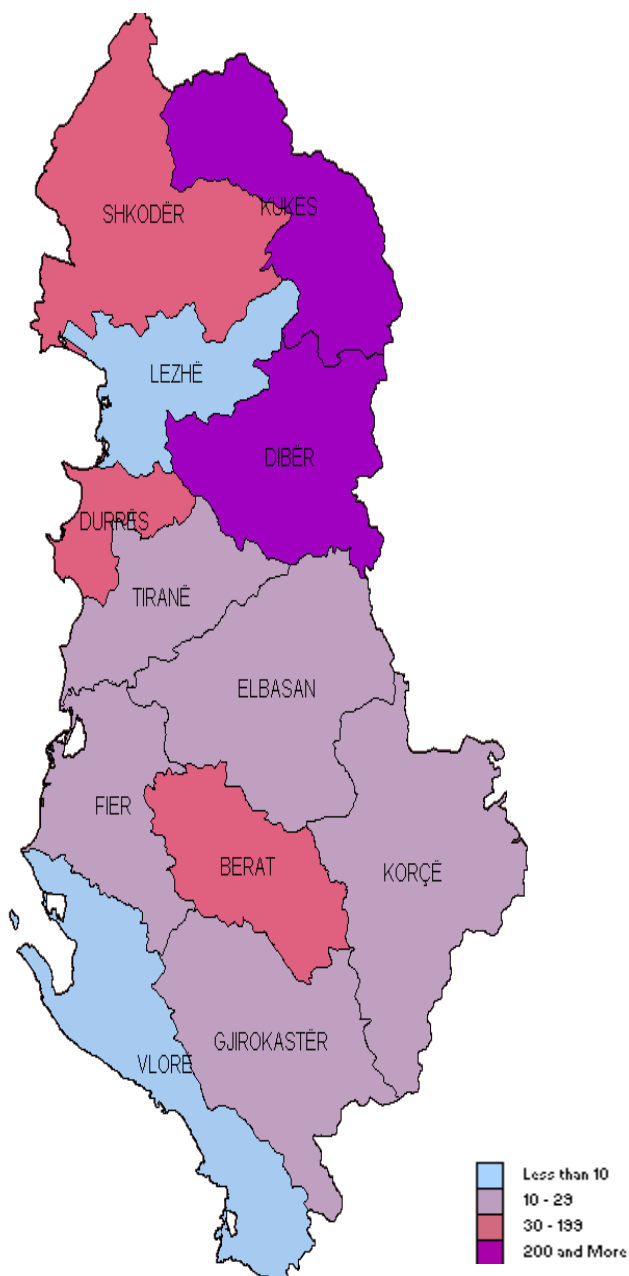
Distribution of diarrheal diseases over the period 1998 – 2009 by districts Country Mean Incidence (cases/100,000 population) and range

Typhoid fever
0.6 (0.1 – 1.4)

Salmonellosis (non-typhoid)
13.6 (1.3 – 42.0)



Poisoning
168.3 (2.7 – 1568.4)



Shigellosis
24.2 (2.9 – 65.8)

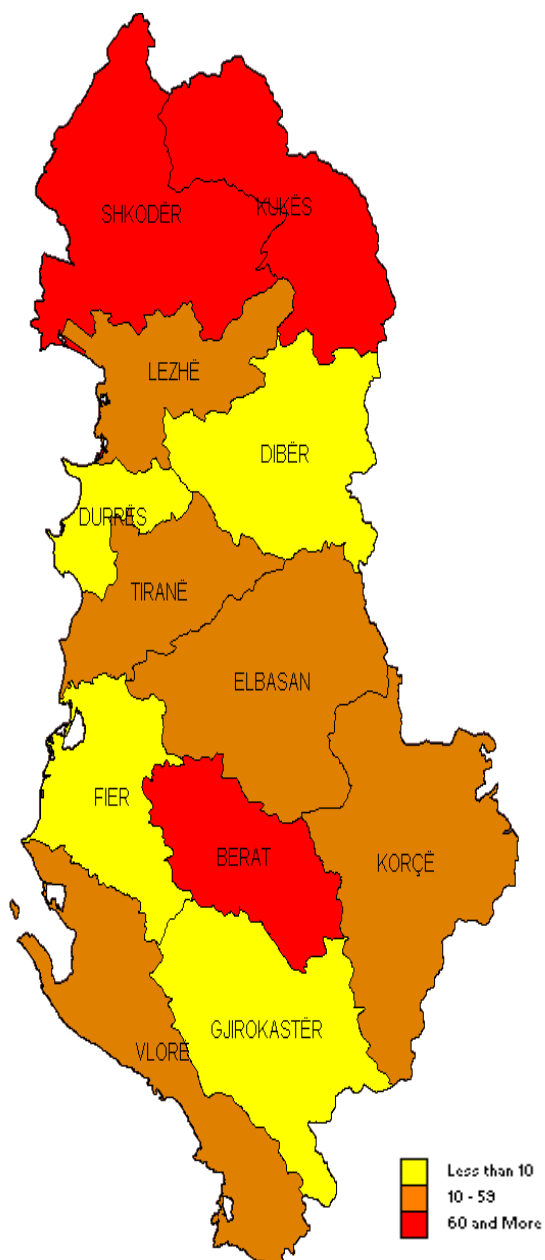
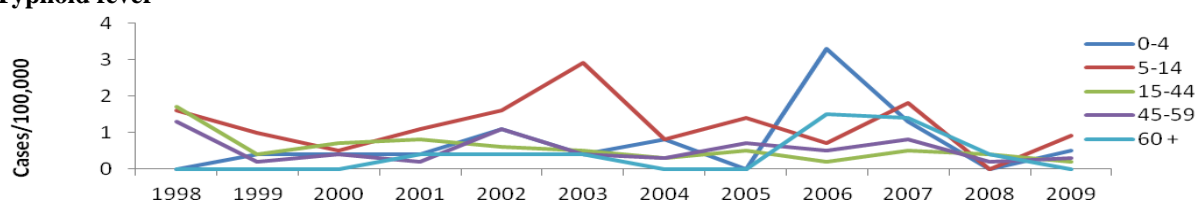


Table. 3 Distribution of diarrheal diseases case over the period 1998-2009 by age - group

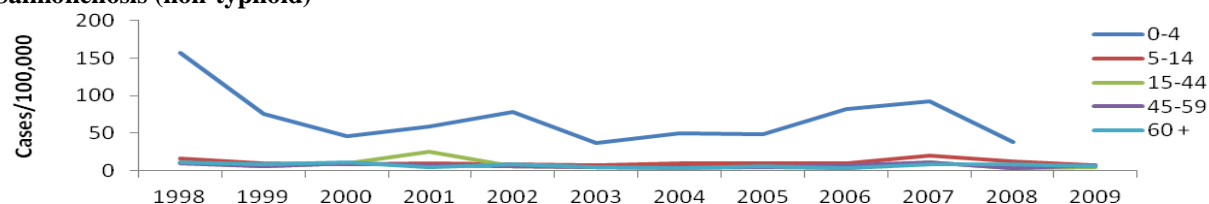
Disease		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
		no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases
Typhoid fever	0-4	0	1	1	1	3	1	2	0	8	3	0	1
	5-14	10	6	3	7	10	18	5	8	4	10	0	5
	15-44	21	8	6	2	17	2	0	2	0	0	3	0
	45-59	5	1	3	1	2	2	0	0	2	0	1	17
	60+	0	0	0	1	1	1	0	0	4	4	1	0
Salmonellosis (non-typhoid)	0-4	429	206	125	162	207	94	127	120	196	222	90	74
	5-14	106	62	54	58	57	43	61	59	56	113	69	39
	15-44	145	75	137	137	78	64	48	72	48	158	50	70
	45-59	53	34	56	40	39	29	26	28	41	68	25	43
	60+	24	18	24	10	20	12	8	15	11	23	23	15
Shigellosis (bacillary dysentery)	0-4	386	343	301	437	347	349	339	301	317	313	158	127
	5-14	132	150	145	162	138	158	206	120	108	114	87	63
	15-44	207	198	154	155	117	169	120	96	93	104	74	46
	45-59	90	92	83	91	63	80	63	52	59	91	38	46
	60+	33	34	45	40	29	39	36	38	37	30	33	18
Poisoning	0-4	264	176	209	164	296	269	282	197	220	399	342	325
	5-14	264	283	317	392	592	437	528	402	471	611	593	599
	15-44	472	583	957	1091	1217	1418	1264	877	1208	1391	1240	1657
	45-59	143	109	282	283	373	447	388	500	408	528	466	611
	60+	33	35	61	57	123	94	74	224	108	138	123	178
Amoebiasis	0-4	11	28	11	1	2	0	3	3	4	0	1	0
	5-14	5	12	0	0	1	0	2	1	0	0	0	0
	15-44	21	8	6	2	17	2	0	2	0	0	3	0
	45-59	5	1	3	1	2	2	0	0	2	0	1	0
	60+	3	0	0	0	2		0	1	0	0	1	0

Figure 2 the incidence rate of diarrheal diseases during the years 1998-2009 by age groups

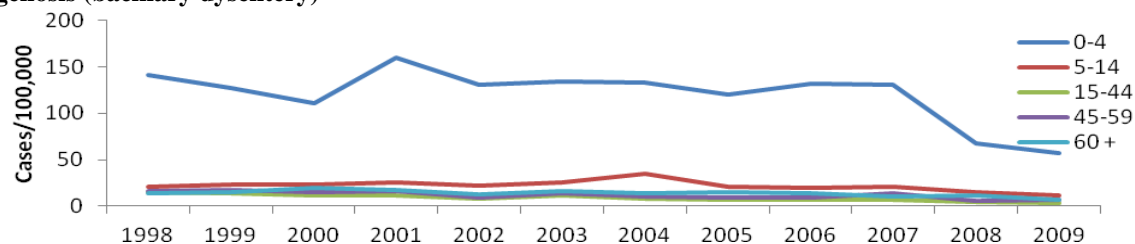
Typhoid fever



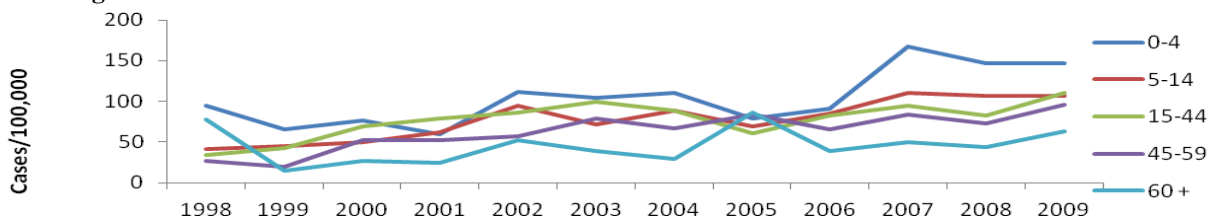
Salmonellosis (non-typhoid)



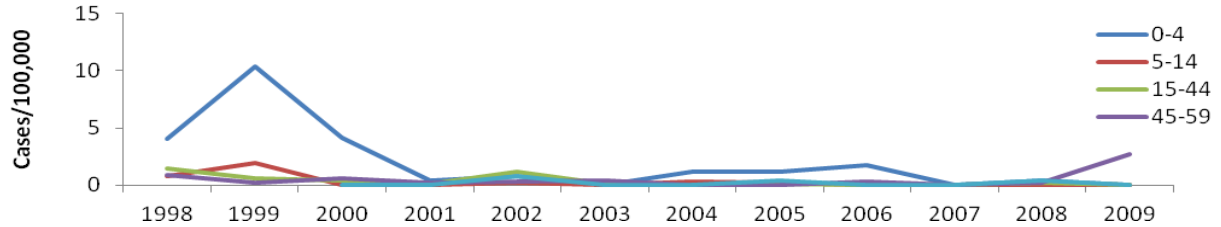
Shigellosis (bacillary dysentery)



Poisoning



Amoebiasis



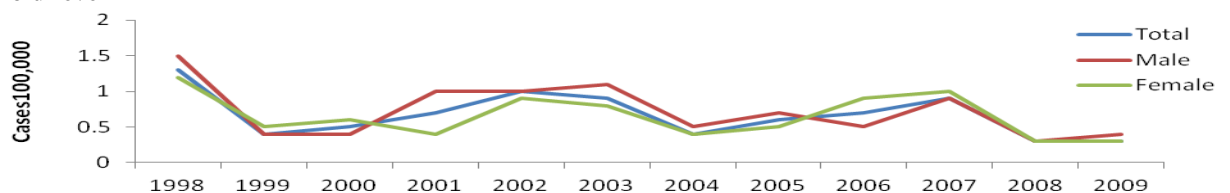
The results presented in Table and Figure 2 indicate that pediatric age groups (0-4 and 05-14 years) are most affected by this group of diseases. Poisoning incidence rate was higher for all age groups compared with others diarrheal diseases, showing increasing trend.

Table .4 Distribution of diarrheal diseases cases during the years 1998-2009 by gender

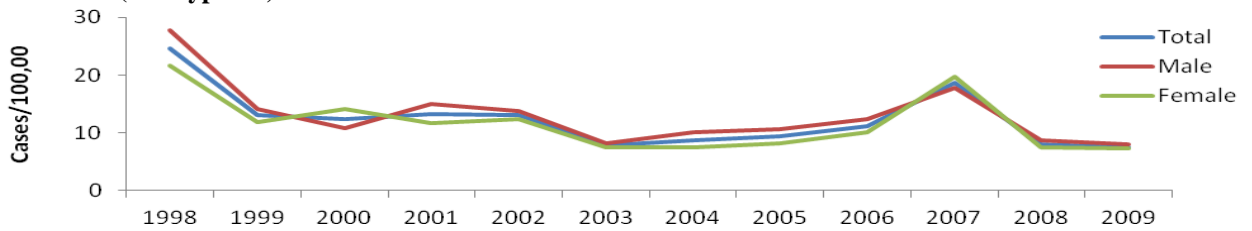
Disease	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	
Typhoid fever	Total	41	13	15	21	30	29	13	19	22	29	8	11
	Male	23	6	6	15	16	17	7	11	8	14	4	6
	Female	18	7	9	6	14	12	6	8	14	15	4	5
Salmonellosis (non-typhoid)	Total	757	395	380	407	401	242	270	294	352	584	257	241
	Male	431	216	165	228	211	125	155	165	194	278	138	127
	Female	326	179	215	179	190	117	115	129	158	306	119	114
Shigellosis (bacillary dysentery)	Total	848	817	728	885	694	795	764	607	614	652	390	300
	Male	458	412	370	490	384	410	402	297	320	338	198	161
	Female	390	405	358	395	310	385	362	310	294	314	192	139
Poisoning	Total	1176	1186	1826	1987	2601	2665	2536	2200	2415	3067	2764	3370
	Male	617	591	902	976	1353	1452	1434	1101	1376	1661	1538	1880
	Female	559	595	924	1011	1248	1213	1102	1099	1039	1406	1226	1490
Amoebiasis	Total	45	49	20	4	24	4	5	7	6	0	6	0
	Male	29	25	9	3	17	2	3	4	4	0	1	0
	Female	16	24	11	1	7	2	2	3	2	0	5	0

Figure 3 The incidence rates of diarrheal diseases during the years 1998-2009 by gender

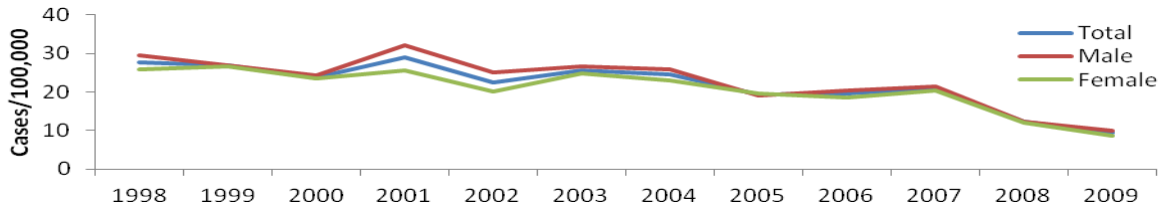
Typhoid fever



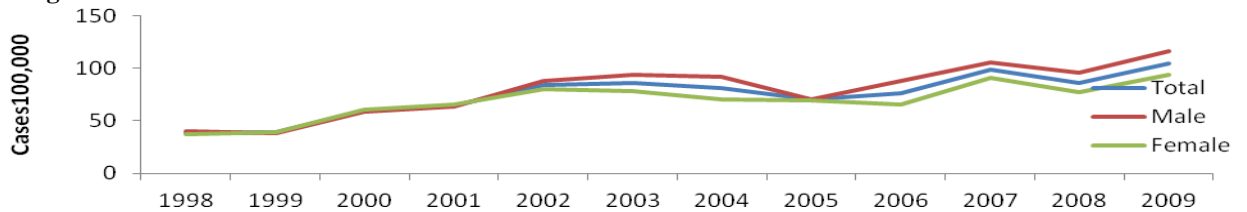
Salmonellosis (non-typhoid)



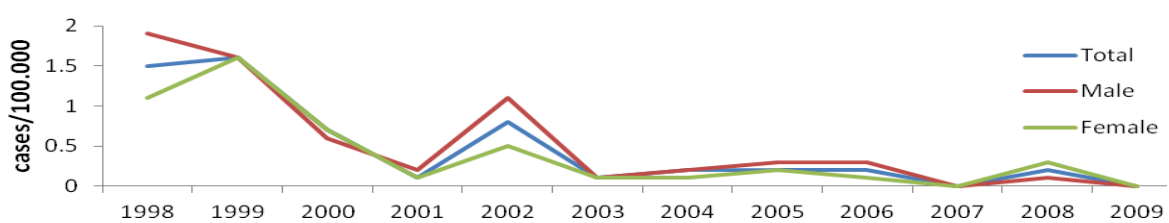
Shigellosis (bacillary dysentery)



Poisoning



Amoebiasis



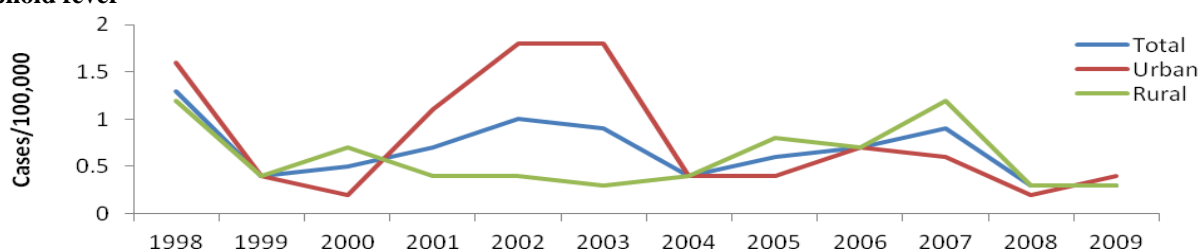
Epidemiological surveillance data for diarrheal diseases by gender are presented in detail in table 4 (number of cases), and in figure 3 is presented the incidence rate (cases/100.000 inhabitants). The incidence rate of these diseases showed a decreased trend without differences between the genders (male and female). The incidence rate of poisoning is presented with an increased trend from year to year.

Table 5 Distribution of ca diarrheal diseases cases over the period 1998-2009 by residence

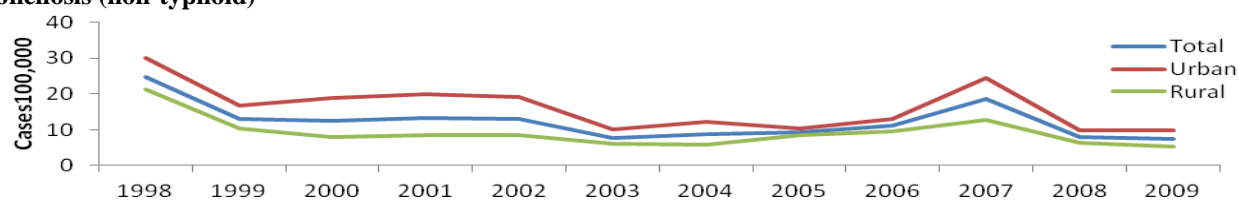
Disease		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
		no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases	no. cases
Typhoid fever	Total	41	13	15	21	30	29	13	19	22	29	8	11
	Urban	19	5	3	14	23	24	6	6	11	9	3	6
	Rural	22	8	12	7	7	5	7	13	11	20	5	5
Salmonellosis (non-typhoid)	Total	757	395	380	407	401	242	270	294	352	584	257	241
	Urban	370	208	236	254	249	136	167	144	195	379	155	155
	Rural	387	187	144	153	152	106	103	150	157	205	102	86
Shigellosis (bacillary dysentery)	Total	848	817	728	885	694	795	764	607	614	652	390	300
	Urban	441	471	399	509	336	373	442	320	325	388	210	234
	Rural	407	346	329	376	358	422	322	287	289	264	180	66
Poisoning	Total	1176	1186	1826	1987	2601	2665	2536	2200	2415	3067	2764	3370
	Urban	398	507	814	811	1117	1194	1309	979	1271	1706	1496	1639
	Rural	778	679	1012	1176	1484	1471	1227	1221	1144	1361	1268	1731
Amoebiasis	Total	45	49	20	4	24	4	5	7	6	0	6	0
	Urban	27	16	5	2	8		3	4	1	0	0	0
	Rural	18	33	15	2	16	4	2	3	5	0	6	0

Figure 5.1.4 The incidence rate of diarrheal diseases during the years 1998-2009 by residence

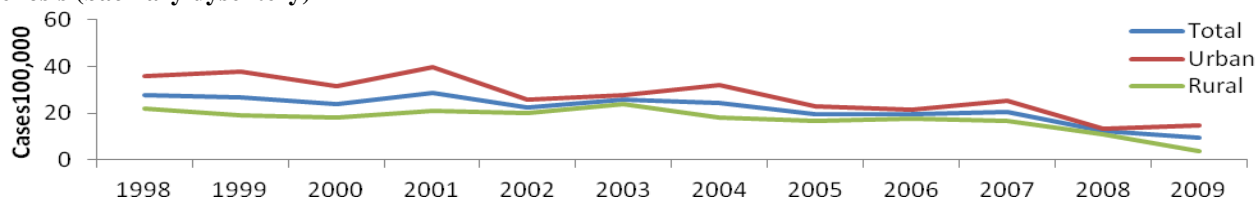
Typhoid fever



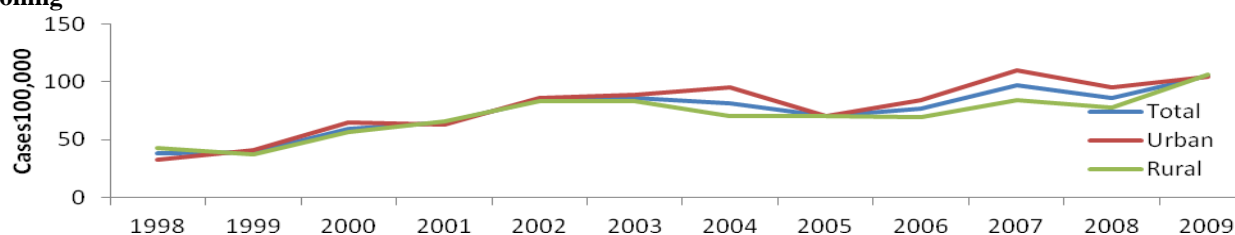
Salmonellosis (non-typhoid)



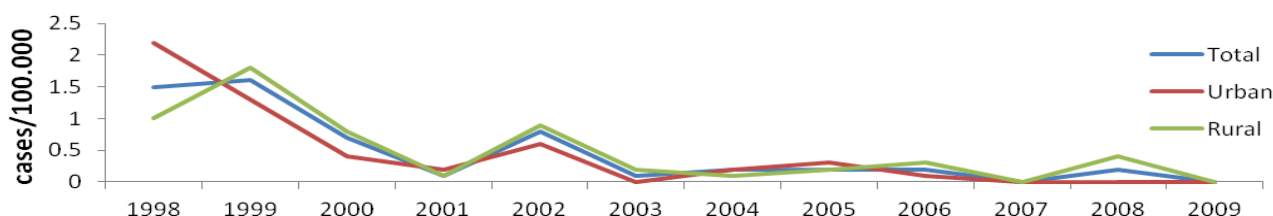
Shigellosis (bacillary dysentery)



Poisoning



Amoebiasis



In the table 5 and figure 4 showed number of cases and incidence rate about the distribution of diarrheal diseases by residence. Our data showed that in urban areas the occurrence of these diseases (typhoid fever, salmonellosis, shigellosis, poisoning and amoebiasis) is about 1.5 times more than rural areas.

Individual notification schedule for diarrheal diseases

The individual notification form contains 5 parts with corresponding questions on the generalities of the patient, history of disease, laboratory diagnosis, epidemiological investigation of the case and the conclusions on the disease (see annex 2).

Statistical analysis is based on the quality and reliability of the information of the system (individual and monthly data).

Indicators of general information about the patient are shown in table 6. The results obtained in section generalities patient showed a lack of "father's name" in over 40% of the notification forms.

- **Part I – "General information"**

Table. 6 The general information data from the individual form

- **Part II – "History of disease"**

The second part of the notification form contains indicators of: onset date, hospitalization data and the disease prognosis (see table 7 and 8). The obtained results showed that the highest percentages of these indicators are known (compiled).

	Typhoid fever		Salmonellosis (non-typhoid)		Shigellosis (bacillary)		Poisoning		Amoebiasis	
	Yes	Missing	Yes	Missing	Yes	Missing	Yes	Missing	Yes	Missing
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	n (%)
Father's name	16 (59.3)	11 (40.7)	132 (50.2)	131 (49.8)	251 (79.2)	66 (20.8)	57 (30.8)	128 (69.2)	6 (60)	4 (40)
Gender	27 (100)	0	263 (100)	0	317 (100)	0	185 (100)	0	10 (100)	0
Age	25 (92.6)	2 (7.4)	261 (99.2)	2 (0.8)	309 (97.5)	8 (2.5)	185 (100)	0	10 (100)	0
Profession	27 (100)	0	263 (100)	0	317 (100)	0	185 (100)	0	10 (100)	0
Address	26 (96.3)	1 (3.7)	203 (77.2)	60 (22.8)	288 (90.8)	29 (9.2)	154 (83.2)	31 (16.8)	10 (100)	0

Table 7. The data of the disease history by individual form of notification

	Typhoid fever		Salmonellosis (non-typhoid)		Shigellosis (bacillary dysentery)		Poisoning		Amoebiasis	
	Yes	Missing	Yes	Missing	Yes	Missing	Yes	Missing	Yes	Missing
	No (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Date of onset	26 (96.3)	1 (3.7)	229 (87.1)	34 (12.9)	303 (95.6)	14 (4.4)	181 (97.8)	4 (2.2)	10 (100)	0
Hospitalized	27 (100)	0	255 (96.9)	8 (3.1)	312 (98.4)	5 (1.6)	185 (100)	0	10 (100)	0

Table 8. The disease prognosis

	Typhoid fever		Salmonellosis (non-typhoid)		Shigellosis (bacillary dysentery)		Poisoning		Amoebiasis	
	No.	%	No.	%	No.	%	No.	%	No.	%
Cured	25	92.6	225	85.6	260	82	164	88.6	10	100
Deceased	0	0	0	0	0	0	0	0	0	0
Missing	2	7.4	38	14.4	57	18	21	11.4	0	0
Total	27	100.0	263	100.0	317	100.0	185	100.00	10	100.0

• Part III- "Laboratory diagnosis"

Case definition is based on case confirmed by specific laboratory tests. Different diseases have different laboratory for their confirmation. Our results about the laboratory confirmation in some individual forms are blank (or missing); in some forms case confirmation is carried out by wrong laboratory (not applicable) see table 9.

Table 9 Case confirmation by laboratory

Disease		Direct		Culture		Serology	
		No.	(%)	No.	(%)	No.	(%)
Typhoid fever No. = 27	Positive	2 (7.4)	not applicable	15 (55.6)		12 (44.5)	
	negative	0		2 (7.4)		0	
	Missing	25 (92.6)		10 (37)		15 (55.5)	
Salmonellosis (non-typhoid) No. =263	Positive	5 (1.9)	not applicable	237 (90.1)		1(0.4) not applicable	
	negative	0		0		0	
	Missing	258 (98.1)		26 (9.9)		262 (99.6)	
Shigellosis (bacillary dysentery) No. =317	Positive	10 (3.2)	not applicable	280 (88.3)		1 (0.3) not applicable	
	negative	0		3(0.9)		0	
	Missing	307 (96.8)		34 (10.7)		316 (99.7)	
Poisoning No. =185	Positive	22 (11.9)	not applicable	65 (35.1)		1(0.5)	
	negative	0		0		0	
	Missing	163 (88.1)		120 (64.9)		184(99.5)	
Amoebiasis No. =10	Positive	0		3(30)not applicable		0 not applicable	
	negative	0		0		0	
	Missing	10 (100)		7(70)		10 (100)	

*Not applicable – means wrong laboratory

• **Part IV – “Epidemiological investigation”**

The fourth section contains indicators of the nature of outbreaks and origin of infection. In over 40% of individual forms, the nature of infectious outbreaks is blank (or missing). Results on the origin of infection showed that the largest number of cases is "blank" and "unknown".

Table 10 Outbreak nature of disease

	Typhoid fever		Salmonellosis typhoid		(non-Shigellosis (bacillary dysentery))		Poisoning		Amoebiasis	
	Yes	Missing	Yes	Missing	Yes	Missing	Yes	Missing	Yes	Missing
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Sporadic	14 (51.9)	12 (44.4)	114 (43.3)	129 (49.1)	233 (73.5)	71 (22.4)	60 (32.4)	107 (57.9)	10 (100)	0
Endemic	1 (3.7)		20 (7.6)		13 (4.1)		18 (9.7)		0	

Table 5.1.11 Origine of infectious for each disease

	typhoid fever	salmonellosis	shigellosis	poisoning	amoebic dysentery	Total
Known	1	23	35	5	0	64
Unknown	13	82	156	55	6	312
Missing	13	158	126	125	0	422
Total	27	263	317	185	6	798

• **Part V – “ Conclusion”**

The fifth part contains the conclusions of the diagnosis, classification of the case as: a suspected or confirmed case. The “confirmed cases” are over 60% of cases with diarrhea diseases, except the poisoning cases which in 57% of them are “suspected”. The data of **table 9** compared with the case classification data (**table 12**) represent a difference between the positivity of the case by appropriate laboratory tests and confirmation of diagnosis.

Figure 12 Case classification

Disease	Confirmed		Suspected		Missing		Total
	No.	%	No.	%	No.	%	
Typhoid fever	18	66.7	3	11.1	6	22.2	27
Salmonellosis (non-typhoid)	230	87.5	18	6.8	15	5.7	263
Shigellosis (bacillary dysentery)	272	85.8	12	3.8	33	10.4	317
Poising	73	39.5	107	57.8	5	2.7	185
Amoebiasis	10	100.0	0	0	0	0	10

Discussion

The incidence rate of diarrhea diseases in Albania even though presenting a decreasing trend during the study period were higher than in the countries of Europe and the neighboring country Greece⁸.

Table 13 Incidence rate of reported cases of infectious diseases in Albania, European Country especially Greece, (year 2009)⁸

Diseases	Albania	European	Greece
	incidence rate/100.000 population	Incidence rate/100.000 opulation	incidence rate/100.000 population
Typhoid fever	0.3	0.16	0.16
Salmonellosis (non-typhoid)	7.5	34.16	6.3
Shigellosis (bacillary dysentery)	9.4	2.08	0.44

Diarrheal diseases in Albania appear as unresolved problems associated with drinking water to urban and rural populations' use⁹.

- Drinking water supply non quality safety in both of areas.
- Temporary supply of tap-water (1-3 hours/day) at the urban areas.
- Disinfected drinking water for urban areas and non-disinfected drinking water for rural areas.

The food safety remains a common problem of a country in transition from the former centralized and limited economy to the current free-market one. The sanitation of human and animal excrements represent another urgent problem in both urban and rural settlements because the development of communal feeding, catering, tourism etc., for which there is not sufficiently strict sanitary inspection¹⁰.

As everywhere, even in Albania, infectious diseases have their flow necessarily related to other factors such as economic development, migration and emigration of population seeking their close supervision on a continuous effort to improve the existing system in order to exercise control over the spread of infectious diseases, to overcome the problems of underreporting, which underestimate the true impact of these diseases in the population health¹¹.

Our results obtained show that the data collected by the surveillance system of infectious diseases in Albania are not reliable as a result of incompatibility with the requirements relating to the attributes of a surveillance system, such as simplicity, flexibility, acceptability and quality of data expressing a major discrepancy between the informations^{6, 12, 13}. This discrepancy and discordance is because of:

- Lack of qualified personnel in public health services
- No estimation of the laws by public and private health structures
- Lack of periodic analysis of epidemiological service activity (central level – IPH) related to discrepancy between notified and monthly reported data of infectious disease.
- Lack of communication between hospital institutions and public health structures
- Reforms in health, health insurance introduction (primary and secondary level) made impossible the full declaration of infectious diseases cases.

Recommendation

Setting up the infrastructure. Completion of medical training. Organizing training courses for health staff responsible for completing the reporting forms. Improvement and equipping of laboratories for laboratory confirmation of cases.

Annex 1

Monthly reporting form of the infectious diseases							Region _____ District _____		Months _____/Year _____										
Nr	DIAGNOSI	Cases						SEX	AGE								HOSPITAL	Deaths	
		TOTAL	URBAN	RURAL	SUSPECTET	CONFIRMED	0-1		1-4	5-14	15-24	25-34	35-44	45-54	55-64	65+			
1	Typhoid fever						M												
							F												
2	Salmonellosis						M												
							F												
3	Shigellosis						M												
							F												
4	Poising						M												
							F												
5	Amoebiasis						M												
							F												

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