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Република Србија
МИНИСТАРСТВО
ПОЉОПРИВРЕДЕ И ЗАШТИТЕ
ЖИВОТНЕ СРЕДИНЕ

Session 2: Progress in implementation of the Protocol in Serbia since becoming a Party

LOCAL WATER SUPPLY METHODS – RURAL AREA

Dr Katarina Spasović, Institute of Public Health of Serbia "Dr Milan Jovanović Batut"

Local method for water supply – rural area

- Rural water supply systems
- Local sources of water supply (public taps, wells, capped springs)

Expert methodological instruction, Programme for the protection of population from infectious diseases, hygiene area

Rural drinking water is monitored through the Programme for the protection of population from infectious diseases.

The Programme is part of the Regulation on Health Protection of the Population from Infectious Diseases ("Official Gazette of the RS", No. 29/2002) and is conducted as one of the Programmes of general interest to the Ministry of Health.

The Institute of Public Health of Serbia "Dr Milan Jovanovič Batut" annually publishes the Annual Report.

The Report "Evaluation of the Programme for the protection of population from infectious diseases in the Republic of Serbia 2002-2010".

Rural water supply systems, Central Serbia

Central Serbia has about 1900 registered rural water supply systems. Data are not entirely accurate, but the estimates are that the largest number of water supply systems was registered in files.

Water purification is performed only in 1.2% facilities.

Disinfection is performed regularly in 12.5% of cases of water supply systems, occasionally in 20%, and not performed at all in 60–70% of facilities.

Systematic testing of water safety is performed regularly in 424 water supply systems, occasionally in 369, and not performed at all in 944 facilities (data for 2009), Table 1.

According to the reports of local institutes for public health, rural water supply systems are often improperly constructed, without sanitary protection zones, without technical acceptance and necessary approvals, chlorinators often exist but are out of function.

The ownership issue is not regulated, and there is a lack of responsibility for maintenance and monitoring of facilities, as well as for inspection of the safety of drinking water.

Absence of a legal entity in managing these water supply systems prevents operation of the sanitary inspection.

Maintenance is not supported by the necessary attention, double connections in some households and various illegal connections increase the risk of water contamination.

As a consequence of long dry periods, many sources are dried up, which makes the overall water supply system situation more difficult, particularly in the summer.

Table 1. Central drinking water suppply method in rural settlements in Central Serbia 2002-2010

Year		2002.	2003.	2004.	2005.	2006.	2007.	2008.	2009.	2010.
No. of settlements		3941	4188	4114	4237	4236	3983	3890	3891	3751
No. of WSS		1635	1947	1909	1910	1919	1908	1916	1993	1751
No. WSS registered in files		1552	1679	1693	1844	1988	1917	1914	1979	1797
WSS status:										
Purification:	Yes	23	21	9	10	10	73	65	24	62
Disinfection	Regularly	155	185	178	193	223	240	239	249	250
	Occasionally	395	686	494	376	545	428	464	506	254
	No	609	912	718	908	1234	1063	913	933	1105
Water hygiene inspection	Regularly	205	245	203	281	304	409	414	424	416
	Occasionally	410	890	551	426	691	438	352	369	307
	No	407	775	666	782	1006	885	901	944	1079

Source: "Evaluation of the Programme for the protection of population from infectious diseases in the Republic of Serbia 2002-2010". Institute for Public Health of Serbia

Sanitary-hygienic characteristics of rural water supply systems did not improve during the evaluation period.

Results of taken health safety samples (on average 6000): there is a high percentage of unsatisfactory samples in bacteriological (19–37%) and physical–chemical (15–25%) terms.

These results are mean values for Central Serbia.

Some districts recorded even worse results: bacteriological 51-63%, physical and chemical irregularities 25-50%. These results are far from WHO recommendations.

The most common causes of bacteriological irregularities are: aerobic mesophilic bacteria, greater number of coliforms and fecal coliforms.

The most common causes of physical and chemical irregularities are: turbidity, increased consumption of $KMnO_4$, increased concentrations of iron, ammonia, nitrate, aluminium, pH.

Rural water supply systems, Vojvodina

Vojvodina recorded positive changes: files include a greater number of water supply systems, the number of water supply systems with regular disinfection has increased, as well as the number of water supply systems with regular water safety inspection.

Urban water supply systems extended to peripheral rural areas or rural water merged with urban, which inceases water supply safety.

Water supply systems are owned by local government (local communities) and they are ususally not governed by professionals.

Some other defficiencies: treatment is minimal, in many cases water is not chlorinated or this is performed occasionally, Table 2.

Table 2. Central drinking water suppply method in rural settlements in Vojvodina 2002-2010

Year		2002.	2003.	2004.	2005.	2006.	2007.	2008.	2009.	2010.
No. of settlements		256	294	298	252	318	323	318	323	323
No. of WSS		224	263	243	166	280	292	307	311	317
No. WSS registered in files		211	230	232	166	286	299	313	317	323
WSS status:										
Purification:	Yes	2	2	2	2	22	22	2	2	2
Disinfection	Regularly	39	24	75	22	158	163	145	140	144
	Occasionally	24	28	28	28	102	109	149	160	162
	No	/	7	2	6	19	19	10	10	10
Water hygiene inspection	Regularly	42	38	88	34	214	225	225	193	212
	Occasionally	/	/	/	/	/	42	42	42	76
	No	/	/	/	/	/	0	0	0	1

Source: “Evaluation of the Programme for the protection of population from infectious diseases in the Republic of Serbia 2002-2010”. Institute for Public Health of Serbia

Water in rural WWS is regularly tested in about 65% of facilities, and in all others occasionally.

In addition to the primary water quality used for water supply, the stated rural water supply system characteristics result in constantly low phsical and chemical harmonisation (15.9%–39.7%) of drinking water, whereas microbiological harminisation is similar to the one in Central Serbia in rural water supply systems.

The concerning fact is that drinking water from specific rural water supply systems in Vojvodina contains increased concentrations of arsenic and is prohibited for use for drinking and food preparation.

Irregularity of water samples is registered in all districts and reaches 99.8% of physical and chemical, and 34% of bacteriologically defective samples.

Causes of physical and chemical irregularities are: colour, turbidity, increased content of organic matter, increased concentrations of ammonia, iron, manganese, arsenic, nitrite, magnesium, potassium and chlorine smell.

Most common causes of bacteriological irregularities are: increased number of aerobic mesophilic, coliforms and faecal coliforms, as well as nematodes and algae presence.

Monitoring in this area was predominantly conducted by hygienic and epidemiological (HE) services within healh care institutions.

Until closure of HE services (2006), water supply systems were filed and monitored, most often in accordance with professional and methodological intructions.

Termination of HE services in health care instritutions resulted in reduction of activities and the question is how they will be perfomed in the future.

In addition to reduced monitoring, the reporting quality also deteriorated.

Public water facilities, Central Serbia

The Programme for the protection of population from contageous diseases is also used for monitoring the hygiene of drinking water from public water facilities (public taps, wells, capped springs).

Information on the number of population in Central Serbia supplied in this manner with drinking water is not available.

Public water facilities in certain periods (summer months, emergency situations) represent a major epidemiological risk when the population, which is normally supplied with drinking water from central facilities, uses water from the mentioned as well as alternative water supply sources.

Facilitis are oftern improperly constructed, unprotected from contamination from immediate surroundings, many do not have chlorinators, or they are not properly maintained, chlorination is irregular as well as filter change, there is frequent degradation of water quality due to septic tanks and unsanitary landfills.

Some incosistency in reporting has been noticed (number of files is larger than the number of facilities).

After termination of HE services, we do not dispose with data and the monitoring scope has been reduced.

Sanitary and hygiene condition of two thirds of pubic water facilities is unsatisfactory, Table 3.

Table 3 Local water supply – public water facilities in Central Serbia

Year		2002.	2003.	2004.	2005.	2006.	2007.	2008.	2009.	2010.
No. of settlements		3623	3790	3829	3900	3839	3559	3531	3532	3446
No. of water facilities		4031	4053	4106	4113	4030	3894	4122	4100	4073
No. of water faciliteis registered in files		4598	4765	4775	4790	4872	4607	4458	4098	4422
Water facility status:	Hygiienic	1034	1119	1107	1099	1048	1065	950	974	1036
	Non-hygienic	2315	2608	2648	2645	2804	2644	3037	2905	3099
Water hygiene inspection	Regular	255	699	694	648	640	635	1263	1276	1280
	Occasional	761	1826	1443	1023	1823	1594	1410	1383	1413
	No	1266	1273	1338	1305	1691	1501	1431	1441	1604

Source: "Evaluation of the Programme for the protection of population from infectious diseases in the Republic of Serbia 2002-2010". Institute for Public Health of Serbia

- The number of samples varies during the observed period, and is significantly lower than in 2010 (4783), in comparison to 2002 (7728).
- There is an example of a district in which, prior to termination of HE services, the number of facilities ocasionally controlled was 232, and after their termination, it was reduced to four inspected facilities.
- Water safety inspection was conducted regularly in about 30% of facilities. In half of the facilities inspection is not conducted. In specific districts, samples are taken only at the request of the sanitary inspection.
- The percentage of irregular samples in districts is large and ranges between 17%–76% (bacteriological irregularity) and 20%–40% (physical and chemical irregularity) with a tendency of deterioration in some districts.

Public water facilities, Vojvodina

In terms of local water supply method (public taps, wells and capped springs) in Vojvodina, the data for the observed period (2002–2010) marked improved reporting, an increased number of registered facilities and facilities in which water safety is inspected regularly or occasionally. There are no data about the percentage of population which in this way supply with drinking water.

On the other hand, the number of facilities which were, after the local inspecion, rated as hygienic is only 50% of the total number.

There is a large number of facilities where water safety is inspected only occasionally, or is not inspected at all.

Table 4 Local water supply – public water facilities in Vojvodina

Year		2002.	2003.	2004.	2005.	2006.	2007.	2008.	2009.	2010.
No. of settlements		239	318	318	310	248	249	246	340	345
No. of water facilities		650	333	483	204	519	496	492	579	507
No. of water faciliteis registered in files		335	375	377	356	541	428	420	511	397
% of population that use water from these facilities		/	/	/	/	/	/	/	/	
Water facility status:	Hygiienic	172	98	98	18	309	296	285	287	345
	Non-hygienic	144	30	29	5	210	200	207	289	182
Water hygiene inspection	Regular	7	26	24	23	213	211	416	317	160
	Occasional	19	6	/	1	282	285	93	33	121
	No	24	/	/	/	/	/	/	/	/

Source: "Evaluation of the Programme for the protection of population from infectious diseases in the Republic of Serbia 2002-2010". Institute for Public Health of Serbia

The status of water facilities, lack of purification and disinfection, affect results of the safety of drinking water.

The number of taken samples varies, in the last four years there were about 2200 samples.

There is a high level of drinking water irregularity in terms of safety during the whole period of observation: 23-44% bacteriological and 60-95% physical and chemical irregularities.

Waterborne outbreaks and diseases

Occurence of diseases as a result of the use of microbioloically unsafe drinking water is monitored within the Sub-Programme V – Prevention and Control of Infectious Diseases, including support to the National Immunisation Programme.

The above stated is part of the Programme of general interest to the Ministry of Health, through the activity of collecting reports on infectious diseases and reports on and termination of outbreaks, including West Nile Fever.

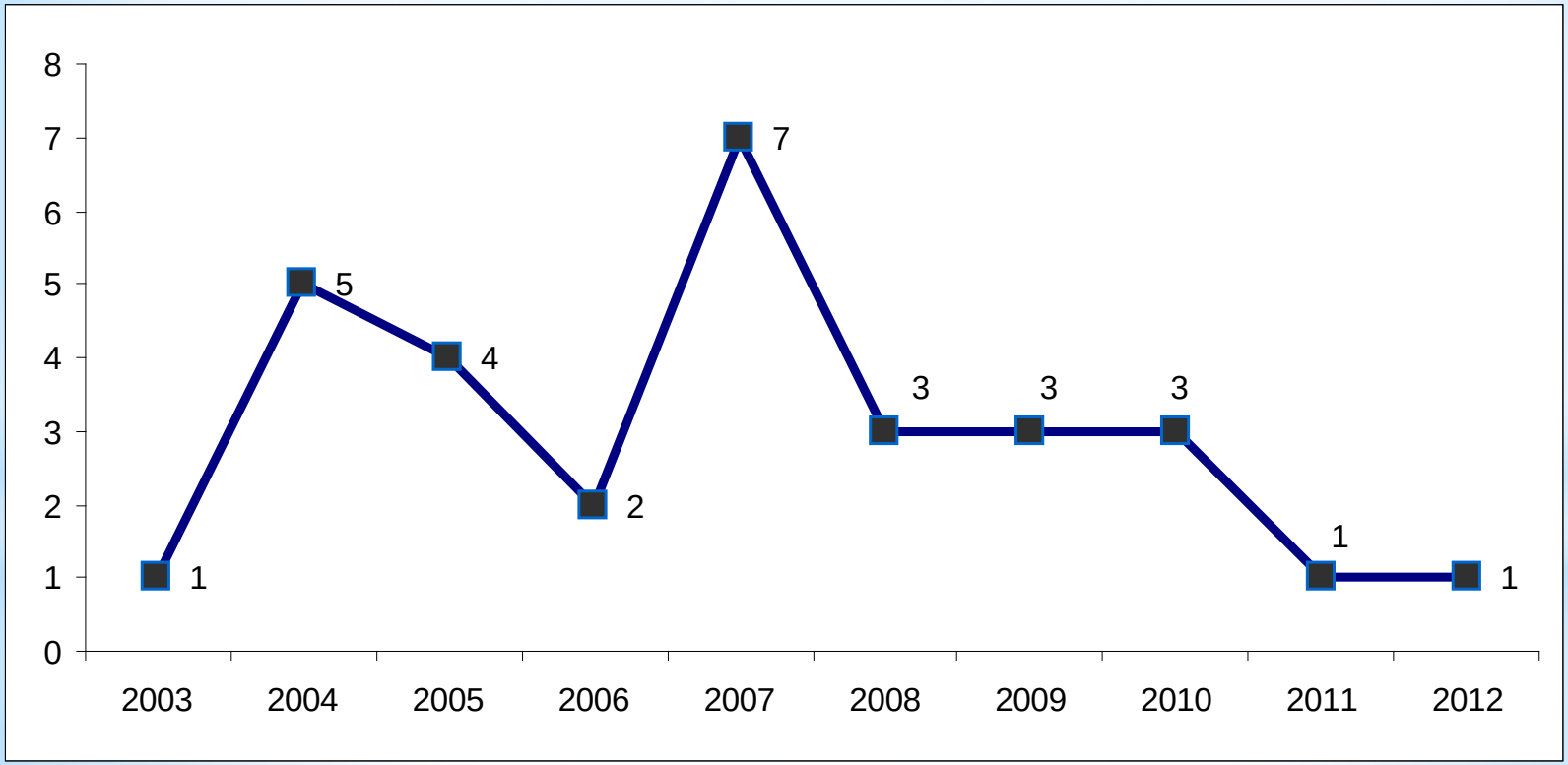
This sub-programme also includes activities related to making proposals for outbreak counter measures and implementing health education.

Outputs is the number of registered waterborne outbreaks and the number of affected individuals resulting from waterborne outbreaks.

In the observed ten-year period, in the Republic of Serbia was registered 30 waterborne outbreaks with 1398 affected individuals.

These outbreaks are characterised by a small number of affected persons as they resulted as a consequence of the use of microbiologically unsafe drinking water, most often from smaller local water supply systems and individual water facilities, which are used for the supply of a small number of citizens with drinking water (Charts 1 and 2).

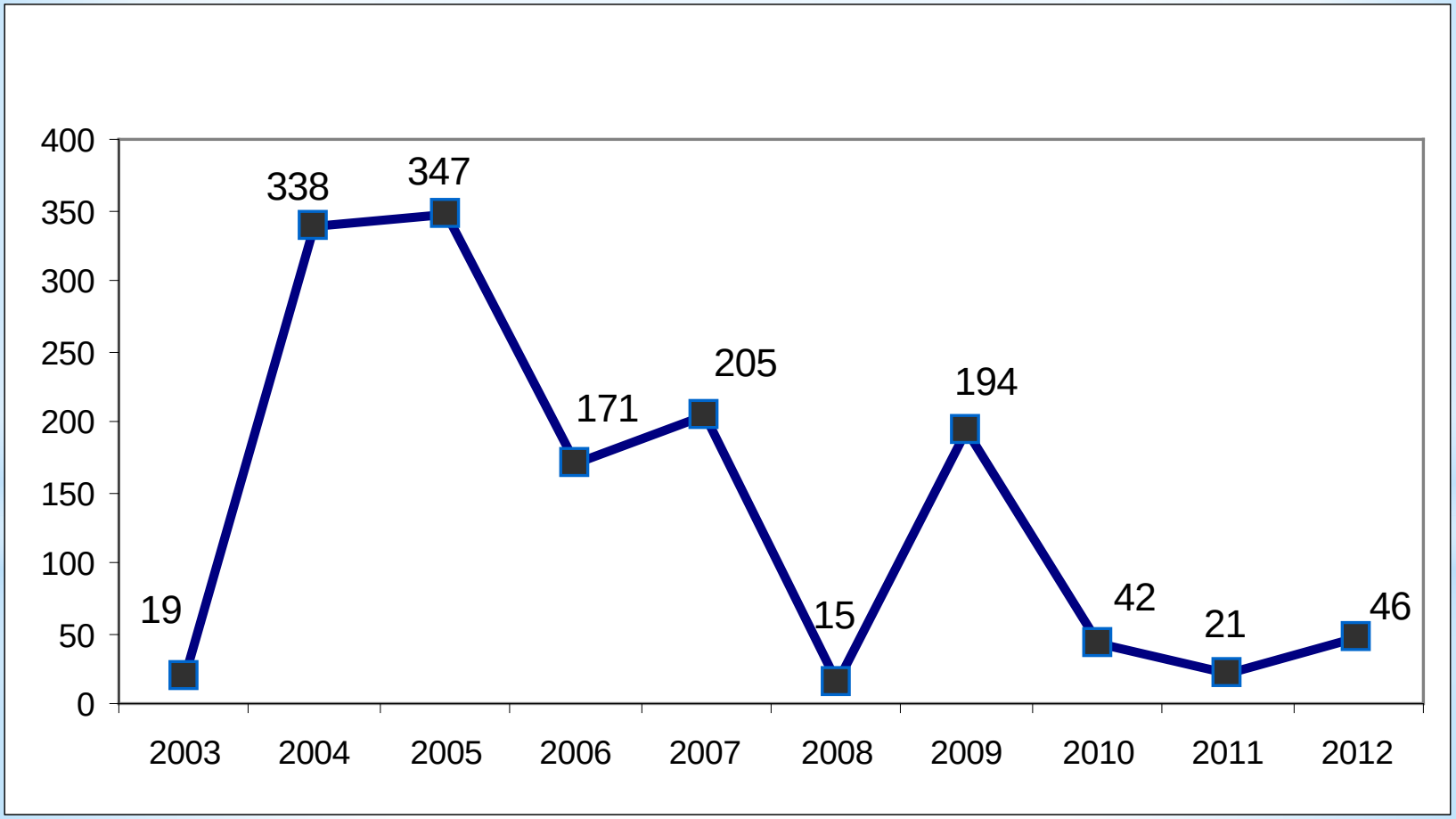
Chart 1 Number of affected individuals in waterborne outbreaks, Serbia 2003–2012



Report on the safety of drinking water from central water supply systems in the Republic of Serbia, (2003-2012). Institute for Public Health of Serbia.

Report on communicable diseases in the territory of the Republic of Serbia, (2003-2012). Institute for Public Health of Serbia.

Chart 2 Number of affected individuals in waterborne outbreaks, Serbia, 2003–2012



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Conclusion

- Rural water suppl systems and local water supply sources represent an epidemiological risk
- It is necessary to continue and improve monitoring and activities in this field (rehabilitation, construction of facilities, determining ownership)

THANK YOU