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SENSORY-BIOLOGICAL-CHEMICAL PROTECTION OF STATES PERSONS IN MONTENEGRO

SUMMARY

In this paper we presented the results of a study on sensory-bio-chemical checks in facilities on the territory of Montenegro visited, regardless of the reason, by national states persons and foreign states persons during their visits to Montenegro. The checks concern the total number of checks, results of compliance, structure of the premises and relations within the checks. The checks were carried out by specialized police officers, officers of inspectorates and national laboratories. We analysed 965 checks over 11 years, with 551 checks showing compliance with the requirements or 57.1% and 414 checks showing non-compliance with the requirements or 42.9%. Detection of non-compliant swabs and samples using scientific and technological analyses prevented poisoning of states persons. Most of the checks were carried out in hotel-tourism facilities, then in residential-type facilities and the lowest number of checks was carried out in other facilities. The total number of checks rose by 6.11% on average per annum, on the basis of which a forecast of checks by 2022 was given. Based on results of the study, proposals are given in the conclusion, aimed at further improvement of work of the police and other authorities. There is also a need for modernization of capacities in terms of human resources and technical equipment and for continuous monitoring of hazards in the field of sensory-biological-chemical protection with a view to preventing possible threats for state persons.

Key words: Protection; states person; safety; checks; food; Montenegro.

INTRODUCTION

Historically, there are numerous examples were famous people were poisoned. For centuries, in order to protect them, dogs that sniffed or were the

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first to taste the food were kept on courts of rulers. Of course, there were also specific people, so-called food tasters, who were to ingest food first and thus "detect" poisons (Thompson et al, 2014).

Even in modern times, the hazard of various substances and means in food and harmful consequences for human safety exists. Acknowledging the importance of food safety, US President George W. Bush issued on 30 January 2004 a presidential directive (HSPD-9) establishing a national policy to defend the agriculture and food system against terrorist attacks. It notes that the food system is vulnerable to disease, pest, or poisonous agents and due to its complex structure provides potential targets for attack (Rasco & Bledsoe, 2019).

Contrary to deliberate attempts to put protected persons in danger - the food hazards occur also in absence of bad intentions, so certain protective measures have to be taken (Manning and Soon, 2016; Lopez-Hernandez et al., 2014). This is particularly noticeable if we take into account that hazards concerning water, air, soil and food occur on daily basis (Koumolou et al, 2013; Todd et al., 2010; Spalevic, 2011; Chalise et al., 2019).

In Europe, one of the most significant achievements when it comes to food safety policy is issue concerning food labelling (Boqvist et al., 2018). Consumer have the right to be informed, including the data what the food they buy on the market *contains* (Puster, 2018) where it originates in, how to *store it safely* and prepare it and *use by/best by date* (Proso & Sokanovic, 2009; Keener et al, 2014). Therefore, food is a product intended for human consumption, drinks and water used in food (Bel et al., 2019; Drew and Clydesdale, 2014).

Apart from humans, animals and plants are also exposed to various diseases and harmful effects. We are surrounded by modern chemical and biological hazards and diseases that in everyday life we recognize as lumpy skin disease, avian influenza, swine flu, and bluetongue disease, various types of salmonellae, trichinella, tapeworms, and anthrax. If we add also radioactive substances, plant and animal toxins and inorganic toxins (arsenic-rat poison, potassium cyanide) and physical hazards in food (glass, metal particles) then legal, institutional, organizational, scientific-educational, pedagogical, human resources, operational-tactical and other measures need to be undertaken in order to protect people, facilities and objects (Ntemiri et al., 2019, Carpenter, 2018; Corradini et al., 2018; Froude et al., 2011). All the measures stated above are implemented through cooperation and exchange of information among police, laboratories, inspectorates and other authorities. However, despite all the measures undertaken, when it comes to protection of security of states persons, sensory-bio-chemical protection is provided by specialized inspectors of special organizational unit of the police[2], either independently or in cooperation with competent inspectorates

[2]The Sector for the Protection of Persons and Facilities has one post systematized - independent police inspector bio-chemical protection engineer. http://www.mup.gov.me/biblioteka/pravilnici?alphabet=lat%3fquery%3dsistemat&sortDirection=desc&pagerIndex=2 accessed on 27 March 2019.

(e.g. sanitary, veterinary) and with representatives of the national reference laboratory.

Before each activity, in order to protect protected persons covering the highest offices in the state - in accordance with the legislation in force and standards of profession, the police officers, in cooperation with competent officers of inspectorates and laboratories, have to provide SBHP. Activities of protected persons concern visits to hotel-tourism and hospitality facilities, business, commercial and religious buildings, state administration buildings, activities in residences, etc. Therefore, these activities vary from operational, through local political activities to receptions for foreign officials.

With regard to various hazards and manner of checks, the activity concerning the protection of persons we shall name - sensory-bio-chemical protection (SBCP). SBCP is a preventative activity encompassing the control of facilities visited by states persons regardless of the reason, in terms of control of health safety of food and water, food hygiene, medicinal products, safety of air and general use items, health and sanitary status of staff and fuels.

In practical terms, the SBCP is carried out by sensory-bio-chemical checks (SBCC). Therefore, we can say that SBCC is a preventative direct practical activity for implementation of sensory-bio-chemical protection. It is carried out by sensory and various biochemical scientific and technological analyses with a view to identification and elimination of hazards - risks (by taking samples and swabs) which may pose health risk for protected persons.

SBCC includes health examination of people, food checks, and checks of general use items, anti-radiation examination and analysis of fuels in order to establish their compliance with requirements. SBCC is carried out as follows: *sensory (organoleptic), laboratory examination of samples and swabs taken, detection on-the-spot, by examination of the premises and means of transport and documentary checks* (Spalevic, 2016; Spalevic, 2010). Where checks or techniques used reveal inadequate safety levels, the use of facilities or food serving is prohibited.

MATERIAL AND METHODS

The subject of the study is SBC checks in Montenegro in the period 2007-2017. The scope of the set is final and covers 965 SBC checks carried out on the territory of Montenegro (Figure 1) in the period 2007-2017.

The objective of the study is to analyze the level of health hazard or risk of states persons when ingesting food in certain facilities. All the analyses were performed at the laboratories of the Institute of Public Health of Montenegro in Podgorica and Ministry of the Interior of the Government of Montenegro.

Pursuant to the Article 12 of the Law on Food Safety (Official Gazette 14/07), the Ministry of Health of the Government of Montenegro adopted the Rulebook on Microbiological Criteria for Food, which prescribes microbiological criteria on permitted types and quantities of microorganisms, bacterial toxins and histamines dangerous to health, as well as microbiological criteria for process

hygiene, methods of determination and assessment, i.e. rules that must be followed in accordance with the implementation of general and special hygiene requirements.

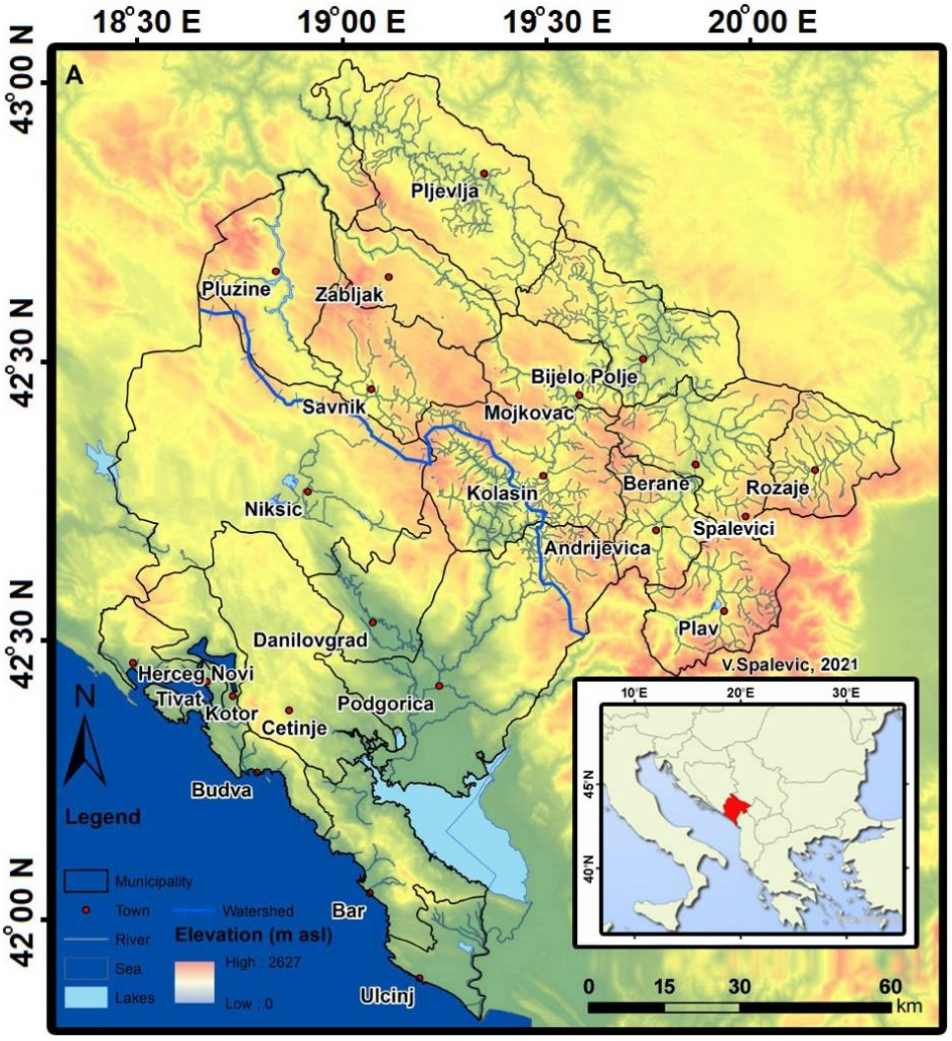


Figure 1. Study area where the Sensory-Biological-Chemical protection of States Persons was implemented

The competent authority responsible for carrying out official controls checks compliance with applicable regulations, but also requires further sampling and testing to prove the presence or determination of other micro-organisms, their toxins or metabolites in the context of risk analysis, in terms of work verification or when there is reasonable doubt in the safety or suitability for use of some type of food. According to the Law on Food Safety (Official Gazette 14/07), Article

39 defines that the issue of food safety is monitored at all stages of production, processing and distribution, and that they are under the constant control, so it must be ensured that food meets food regulations that are important for their business and health safety. During the subject controls, the control of general hygiene requirements was performed, fulfilling special hygiene requirements in all phases of food trade and in terms of physical, chemical and microbiological criteria, compliance of temperature regimes with requirements in individual phases, maintenance of refrigeration chain, sampling and testing, compliance with products. The system has also established an ongoing control procedure based on the Hazard Analysis and Critical Control Points (HACCP) system, which allows the identification of microbiological, chemical and physical factors that may be harmful to human health. Control analyzes were performed in compliance with the Microbiological hygienic Standards for objects, surfaces and hands that come into contact with food.

Standards have been determined in accordance with ISO 18593: Microbiology of food and animal feeding stuffs — Horizontal methods for sampling techniques from surfaces using contact plates and swabs. The frequency and number of samples were determined taking into account the purpose and scope of control work.

Requirements for food safety assessment are based on the Table: Certain microbiological requirements that are consistent with the values that make food unsafe in accordance with Article 24 of the Food Safety Act, with indications of quantities that may endanger human health (in this case protection of the State Persons). If, during the control, a microorganism or its toxins or metabolites were found in the food that are not listed in the table, and could be dangerous to human health the samples would be further assessed for microbiological control. In case that the defect is found in the sample, the food must be withdrawn or recalled.

A ***statistical method*** separating statistical description and statistical analysis was used in this paper. The methods are grouped into: statistical analysis of occurrence (in the period 2007-2017) and occurrence dynamics analysis (analysis of occurrence trends 2007-2017 with tendency forecast by 2022).

The statistical data collected were classified into the time series, presented in tabular and graphic form and subject to statistical analysis for the purpose of highlighting the structure, significant characteristics and composition of the statistical population. In dynamic analysis of time series of the following are used: Graphical method, index number method, development rate and trend analysis method. The study methods selected provided information and results that are presented in the discussion of this paper.

RESULTS AND DISCUSSION

Statistical analysis of occurrence

The information on the structure of the occurrence contains data on the composition and the extent of the occurrence (i.e. on the frequency of the

occurrence in the statistical set) and data on internal relations between elements of the occurrence (configuration of the occurrence).

The composition and the extent of SBCC occurrence concern the territory of Montenegro in the period 2007-2017, where in 551 facilities compliance with the requirements were identified, accounting for 57.1% of the total number of checks, while non-compliance with the requirements was identified in 414 establishments, accounting for 42.9% of the total number of checks.

Table 1. Results of checks in establishments, by compliance status [1]

Samples	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	∑	**%**
SBCP, correct	35	38	59	45	100	70	44	26	28	46	60	551	57.1
SBCP, not correct	23	39	42	54	39	36	64	21	25	26	45	414	42.9
Total of SBCP	58	77	101	99	139	106	108	47	53	72	105	965	100

[1] *Annual report of the Group for Antiterrorism Checks of the Sector for the Protection of Persons and Facilities of the Police Administration of Montenegro, 2007-2017.*

The maximum number of total SBCC in facilities as well as the maximum number of SBCC establishing compliance with the requirements was achieved in 2011, the year where 139 checks were made in total, establishing compliance in 100 facilities. The minimum number of facilities checked was carried out in 2014, with 47 checks establishing compliance in 26 facilities and non-compliance in 21 checks.

All SBCC were carried out in facilities structurally divided into: closed-type facilities, hotel-tourism and hospitality facilities and other facilities, such as commercial and religious buildings, company premises, etc.

Table 2. Sensory-bio-chemical checks in facilities in the period 2007-2017.

No	**Structure**	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
1	Closed type	17	17	23	19	30	15	16	5	9	10	31
2	Hotel facilities	41	60	70	73	103	85	81	26	41	49	68
3	Other facilities	0	0	8	7	6	6	11	16	3	13	6
	Total	58	77	101	99	139	106	108	47	53	72	105

By structure of the facilities checked, the maximum number of closed-type facilities checked (residential buildings, etc.) was carried out in 2017, 31 checks, and the minimum number of facilities checked was in 2014, with 5 checks.

The maximum number of hotel-tourism and hospitality facilities checked was in 2011, with 103 checks, while the minimum number of facilities checked was in 2014, with 26 checks.

The maximum number of checks of other facilities was carried out in 2014, with 16 checks and the minimum number of checks was carried out in 2007 and 2008, when there were none.

Having regard of the fact that mean values represent a significant group of statistical indicators in research and analysis, i.e. that they are a quantitative represent of all individual modality values, we calculated them. Apart from being fundamental in statistical analysis, middle values are used also in dynamical analysis.

The selection of the middle value we will apply in a research depends also on the level of data relatedness and homogeneity in a series on occurrence that is observed. The table below shows the results of monitoring of data homogeneity in the series on all check categories. We calculated first the simple arithmetic mean using the following formula:

$$\overline{X} = \frac{\sum_{i=1}^{N} x_i}{n} \tag{1}$$

then standard deviation

$$\sigma = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(y - y_i)^2} \tag{2}$$

And variation coefficient in the end

$$V_{[\%]} = \frac{\sigma}{\overline{X}} \cdot 100 \tag{3}$$

Table 3. SBC checks homogeneity analysis by annual values.

Type of inspection	Mean value	Standard deviation	Coefficient of variation
Total number of SBC checks	87.73	27.11	30.91%
Number of SBC checks, correct	50.09	20.42	40.77%
Number of SBC checks, incorrect	37.64	12.89	34.26%

Since variation coefficient is above 30% in all averages stated, we can conclude that average values do not represent the occurrence properly. Variability of 30-50% is considered moderate. The lower the coefficient of variation, the lower the level of dispersion around the arithmetic mean, and vice versa.

Further homogeneity analysis of checks in certain structures of facilities, presented in Table 4, shows that average annual number of checks do not represent the occurrence properly, as their variation coefficient is above 30%.

Table 4. Homogeneity of checks in certain structures of facilities (annual values)

Structure of facilities	Mean value	Standard deviation	Coefficient of variation
Structure of Closed type	17.45	7.77	44.54%
Hotel tourist facilities	63.36	21.58	34.06%
Other facilities	6.91	4.78	69.13%

The analysis of homogeneity of total number of checks by years, presented in Table 5, show relatively strong non-homogeneity in 2014 (variation coefficient above 50%), as well as pronounced non-homogeneity in other years (variation coefficient above 70% in all), which shows a pronounced difference in number of checks depending on the type of the facility.

Table 5. Homogeneity of total checks per years.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Mean value	19.3	25.7	33.7	33.0	46.3	35.3	36	15.7	17.7	24.0	35.0
Standard deviation	16.8	25.2	26.4	28.7	41.2	35.3	31.9	8.58	16.7	17.7	25.5
Coeff. of variation	57%	98%	78%	87%	89%	100%	89%	55%	94%	74%	73%

When we compare the average number of checks of facilities by years with checks by years we can see that the deviation from the average is high, so other middle values need to be calculated, which is median in this case. In simple series for an uneven number of data, median is found using the formula

Therefore, in a sequence from the highest to the lowest number of SBC checks establishing **compliance**, 50% of checks made is above 45 per annum, and 50% of checks made is below 45 checks per annum.

In a sequence from the highest to the lowest number of SBC checks establishing non-compliance, 50% of checks made is above 39 per annum, and 50% of checks made is below 39 checks per annum.

When it comes to the **total number** of SBC checks, in a sequence from the highest to the lowest, 50% of the checks made was above **99** checks per annum, and 50% of the total checks are below 99 checks per annum.

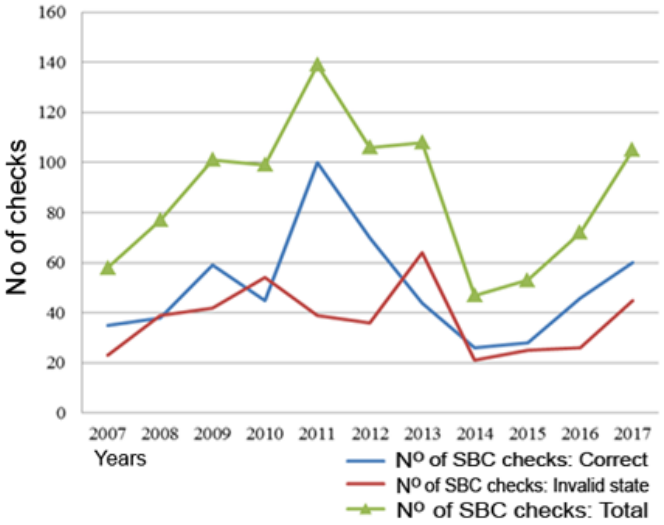
Following the analysis of the structure of the occurrence, we will analyze is configuration as well. We can conclude from Table 6 that the share of SBC checks is the highest in hotel-tourism facilities, followed by closed-type facilities, while the lowest number of SBC checks was carried out in other facilities.

Table 6. An overview of frequency of SBC checks of establishments in Montenegro in the period 2007-2017.

Structure of facilities	2007 [%]	2008 [%]	2009 [%]	2010 [%]	2011 [%]	2012 [%]	2013 [%]	2014 [%]	2015 [%]	2016 [%]	2017 [%]
Structure of Closed type	29.31	22.08	22.77	19.19	21.58	14.15	14.81	10.64	16.98	13.89	29.52
Hotel tourist facilities	70.69	77.92	69.31	73.74	74.10	80.19	75.00	55.32	77.36	68.06	64.76
Other facilities	0.00	0.00	7.92	7.07	4.32	5.66	10.19	34.04	5.66	18.06	5.71
Total [%]	100	100	100	100	100	100	100	100	100	100	100

Occurrence dynamics

Dynamical analysis follows the occurrence over a period of time and shows the developmental tendency of an occurrence. SBC checks chronology is presented in Graph 1 where we can see that the total number of SBC checks is growing in the period 2007-2011, decreasing by 2014 and then increasing again by 2017.



Graph 1. The trend of the total number of SBC checks in Montenegro in the period 2007-2017.

The occurrence dynamics will be analyzed using absolute growth indicators and occurrence development, such as: growth of the occurrence, increase of the occurrence and mean increase of the occurrence.

The growth of the occurrence is calculated using the formula $P_i = N_i - N_b$, where based on Table 7 we can conclude that in 2014 and 2015 the number of SBC checks decreased compared to the reference year 2007, while in other years their number rose. The highest rise in total number of SBC checks was recorded in 2011.

Table 7. Absolute growth indicators (reference year 2007).

SBC checks	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Correct findings	-	3	24	10	65	35	9	-9	-7	11	25
Irregular state	-	16	19	31	16	13	41	-2	2	3	22
Total	-	19	43	41	81	48	50	-11	-5	14	47

Increase of the occurrence is calculated by

$$A_i = N_i - N_{i-1} \quad (5)$$

where based on data from the Table 8 we can see that the highest increase in the total number of SBC checks was in 2011, while the major decline in total number of SBC checks was recorded in 2014.

Table 8. Absolute development indicator.

SBC checks	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Correct findings	-	3	21	-14	55	-30	-26	-18	2	18	14
Irregular state	-	16	3	12	-15	-3	28	-43	4	1	19
Total	-	19	24	-2	40	-33	2	-61	6	19	33

Table 9. shows that the mean increase in the total number of SBCC in facilities was 4.7 checks for the period 2007-2017, showing the development trend of the occurrence.

Table 9. Mean increase of SBC checks.

SBC checks	**Mean increase**
Correct findings	2.5
Irregular state	2.2
Total	4.7

The occurrence dynamics will be analyzed also using the relative growth indicators and occurrence development including: growth index, growth tempo, growth rate, mean growth tempo and average growth rate of the occurrence.

Growth index (R_i) of the occurrence, as an indicator of changes in the occurrence observed expressed as percentage is calculated using the formula:

$$R_i = \frac{N_i}{N_b} \cdot 100 \tag{6}$$

In order to compare the changes in number of SBC checks by years compared to 2007. Table 10 below shows that the total number of SBC checks in 2017 was by 81.03% higher compared to the baseline year 2007, while, for example, in 2014 it was by 18.97% lower than in baseline year 2007.

Table 10. The growth index (reference year 2007) of SBC checks in Montenegro in the period 2007-2017.

SBC checks	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Correct	-	108.57	168.57	128.57	285.71	200.00	125.71	74.29	80.00	131.43	171.43
Irregular	-	169.57	182.61	234.78	169.57	156.52	278.26	91.30	108.70	113.04	195.65
Total	-	132.76	174.14	170.69	239.66	182.76	186.21	81.03	91.38	124.14	181.03

Growth tempo ***(E_i)*** as an indicator of change in development of the occurrence in the period 2007-2017 is presented in Table 11 and is calculated using the following formula

$$E_i = \frac{N_i}{N_{i-1}} \cdot 100 \tag{7}$$

Table 11. Growth tempo of SBC checks in Montenegro in the period 2007-2017.

SBC checks	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Correct	-	108.57	155.26	76.27	222.22	70.00	62.86	59.09	107.69	164.29	130.43
Irregular	-	169.57	107.69	128.57	72.22	92.31	177.78	32.81	119.05	104.00	173.08
Total	-	132.76	131.17	98.02	140.40	76.26	101.89	43.52	112.77	135.85	145.83

Growth rate (S_i) of the occurrence as an indicator of a relative (percentage) extent of the occurrence measured against the extent of the occurrence in the previous year is calculated using the following formula:

$$S_i = \frac{A_i}{N_{i-1}} \cdot 100 = \frac{N_i - N_{i-1}}{N_{i-1}} \cdot 100 = E_i - 100 \tag{8}$$

Table 12 shows that the highest growth rate was recorded in 2017, i.e. that the total number of SBC checks in 2017 was by 45.83% higher than in 2016, while the total number of SBC checks in 2014 was by 56.48% lower than in 2013.

Table 12. Growth rate of SBC checks in Montenegro, period 2007-2017 [%]

SBC checks	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Correct	-	8.57	55.26	-27.73	122.22	-30.00	-37.14	-40.9	7.69	64.29	30.43
Irregular	-	69.57	7.69	28.57	-27.78	-7.69	77.78	-67.2	19.05	4.00	73.08
Total	-	32.76	31.17	-1.98	40.40	-23.74	1.89	-56.5	12.77	35.85	45.83

Mean growth tempo (E_s) of the occurrence is an indicator of growth and development of the occurrence expressing the general direction of the occurrence trends in the period 2007-2017 and is calculated by the following formula:

$$E_s = \sqrt[k-1]{E_1 \cdot E_2 \cdots E_i \cdots E_{k-1}} = \sqrt[k-1]{\prod_{1}^{k-1} E_i} \quad (9)$$

or

$$E_i = \sqrt[k-1]{\frac{N_k}{N_1}} \quad (10)$$

Average growth rate (S_p) of the occurrence in Table 13 provides information on average changes in the occurrence, expressed as percentage, in each year of the period 2007-2017. It is calculated by subtracting 100 from the mean value of development index of the occurrence, expressed in percentage.

Table 13. Mean growth tempo and average growth rate of SBC checks in the period 2007-2017.

SBC checks	**Mean growth tempo**	**Average growth in %**
Correct findings	105.54	5.54
Irregular state	106.94	6.94
Total	106.11	6.11

The data on the occurrence dynamics presented, we can conclude that in the given period, 2007-2017, the total number of SBC checks in Montenegro rose by 6.11% on average. It is important to underline that it is an average annual change, not the overall change at the annual level.

Based on the average mean growth tempo for the total number of SBC checks, amounting to 6.11%, we can forecast the value of number of SBC checks over the next five years. From the formula used to calculate the mean growth tempo

$$E_i = \sqrt[k-1]{\frac{N_k}{N_1}}, \; N_k = N_1 \cdot E_s^{(k-1)} \tag{11}$$

so the next forecast value is

$$N_{k+1} = N_1 \cdot E_s^k \tag{12}$$

Forecast values are shown in the table below.

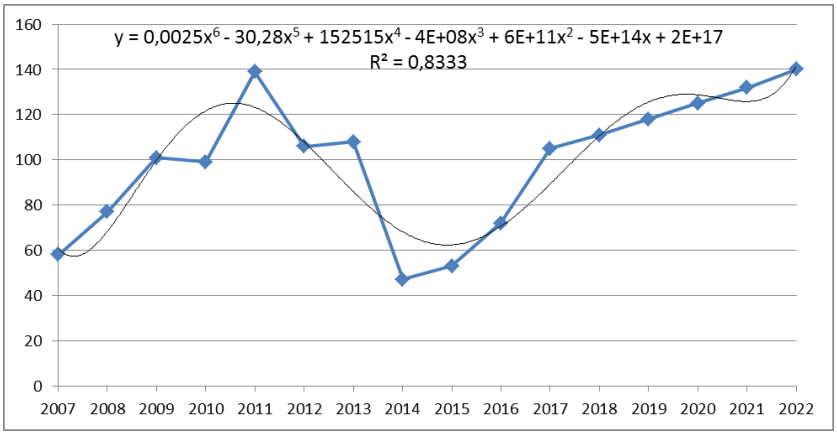
Table 14. Trends of SBC checks in Montenegro by 2022.

Year	2018	2019	2020	2021	2022
Forecast value of SBC checks	111	118	125	132	140

This forecast makes sense only if it is assumed that the factors of relevance for this occurrence would not change substantially in future. Only in that case the occurrence would maintain the same trend.

Extrapolation by trend line extension was made in Graph 2 on reliability of the trend model gives determination coefficient of 0.83. Based on the value of the determination coefficient (R^2), we will know whether the trend line was chosen properly, i.e. whether it adequately represents the occurrence tendency in the period under observation. Determination coefficient is calculated using the following formula:

$$R^2 = 1 - \frac{\sum_{i=1}^{n}(y_i - y_i^t)^2}{\sum_{i=1}^{n}(y_i^2 - \bar{y}_i)} \tag{13}$$



Graph 2. The flow of the occurrence with the trend line and forecast of SBC checks in Montenegro in the period 2007-2022.

The value of the determination coefficient of 0.83 or, expressed in percentage 83.33%, obtained by polynomial function means that 83.33% of periodical or regular changes in number of the total number of SBC checks was explained by the given polynomial function.

CONCLUSIONS

Analysis of the structure of the occurrence and the frequency of SBC checks in Montenegro in the period 2007-2017 should be of use to an efficient management, particularly with regard to prevention.

The homogeneity of total number of checks by years shows relatively strong non-homogeneity in 2014 (variation coefficient above 50%), as well as pronounced non-homogeneity in other years (variation coefficient above 70% in all). Non-homogeneity of checks is a result of various activities of protected persons at the annual level. We will corroborate that with noting that the total number of SBCC in facilities in 2011 was 139, while in 2014 it was 47.

Of the total number of SBC checks, the highest share was carried out in hotel-tourism facilities, followed by closed-type facilities, while the lowest number of SBC checks was carried out in other facilities.

The highest growth in total number of SBC checks compared to the reference year 2007 was recorded in 2011, while the greatest decline in the total number of SBC checks was recorded in 2014. As regard the increase of occurrence of the total number of SBCC, the highest number was recorded in 2011, while the major decline in the total number of SBCC was recorded in 2014. Mean increase in the total number of SBCC in facilities was 4.7 checks for the period 2007-2017, showing the development trend of the occurrence.

Compared to the baseline year 2007, the number of SBCC in 2017 was by 81.03% higher, while for example, in 2014 it was lower by 18.97%. (Growth index - Table 10).

The highest growth rate was recorded in 2017, when the total number of checks was by 45.83% higher compared to 2016. The total number of SBC checks in 2014 was by 56.48% lower than in 2013.

The data on the occurrence dynamics presented, we can conclude that in the given period, 2007-2017, the total number of SBC checks in Montenegro rose by 6.11% on average. It is important to underline that it is an average annual change, not the overall change at the annual level.

Based on the average mean growth tempo for the total number of SBC checks, amounting to 6.11%, we can forecast the value of number of SBC checks over the next five years. Taking into account the data presented, increase in number of police officers in charge of SBCP should be considered in order to improve the quality of SBCP, and hence the protection of persons.

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