



For indicators of ecological state in urban territories

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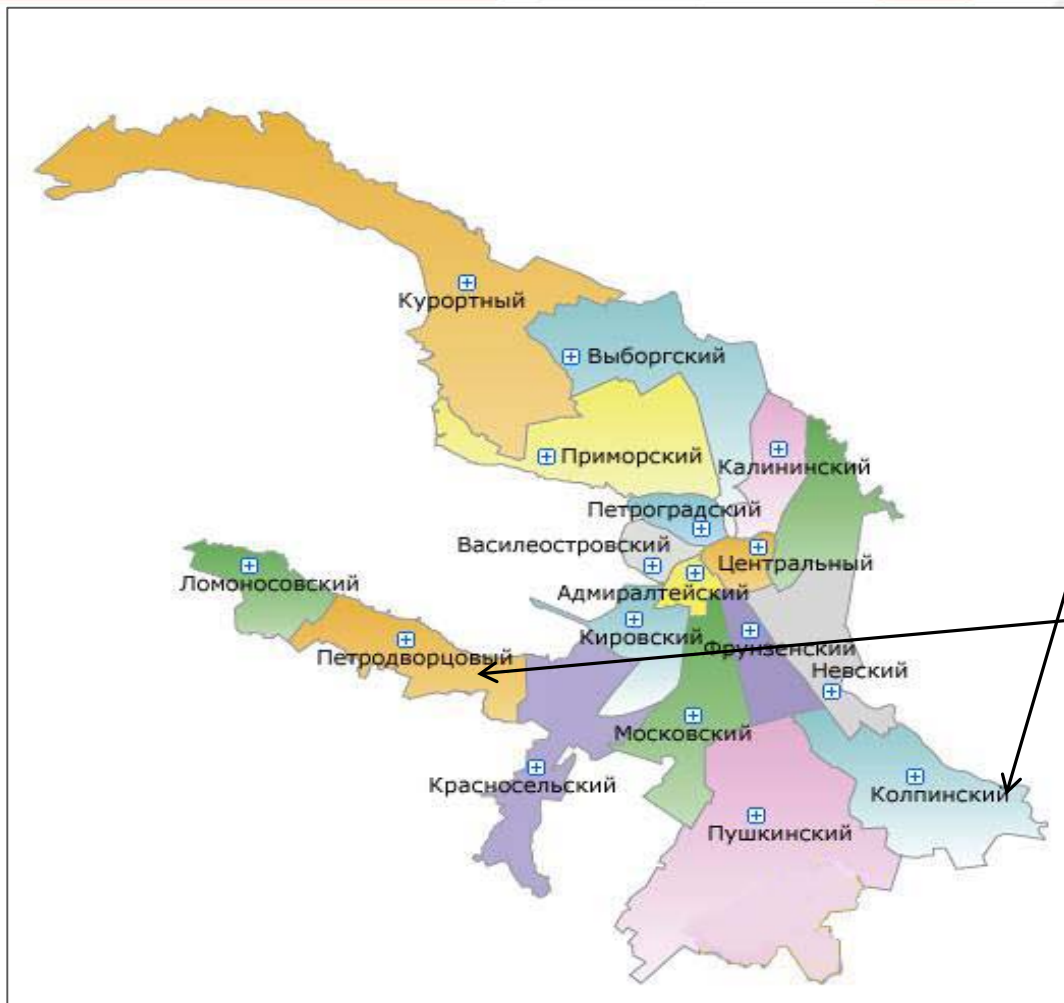


Public health is formed by:

- 1) natural conditions;*
- 2) social and economic factors;*
- 3) technological factors .*

Factors influencing health (World Health Organization for Russia, 1994)

- 1. People's way of life - 50-55%*
- 2. State of the environment - 20-25%*
- 3. Genetic factors - 15-20%*
- 4. Medical care - 10-15%*



Kolpinsky district

Petrodvortsovy district

Fig. 1. Administrative-territorial division of St. Petersburg, 2016.



Kolpinsky district
Area: 105,8 km²
Population: 186 973
17 Plants (15%)
1 Park (3%)





Petrodvortsovyy district

Area: 109 км²

Population: 135 565

9 parks (30%)





The main aims are:

- *to study the health of children as members of risk groups in these areas,*
- *to find out how chemical pollution effects on elemental composition of children's bioassays (hair).*

Methods:

- *statistical (the study of children's morbidity according to statistical reports),*
- *atomic emission and atomic absorption methods (analysis of children's bioassays).*

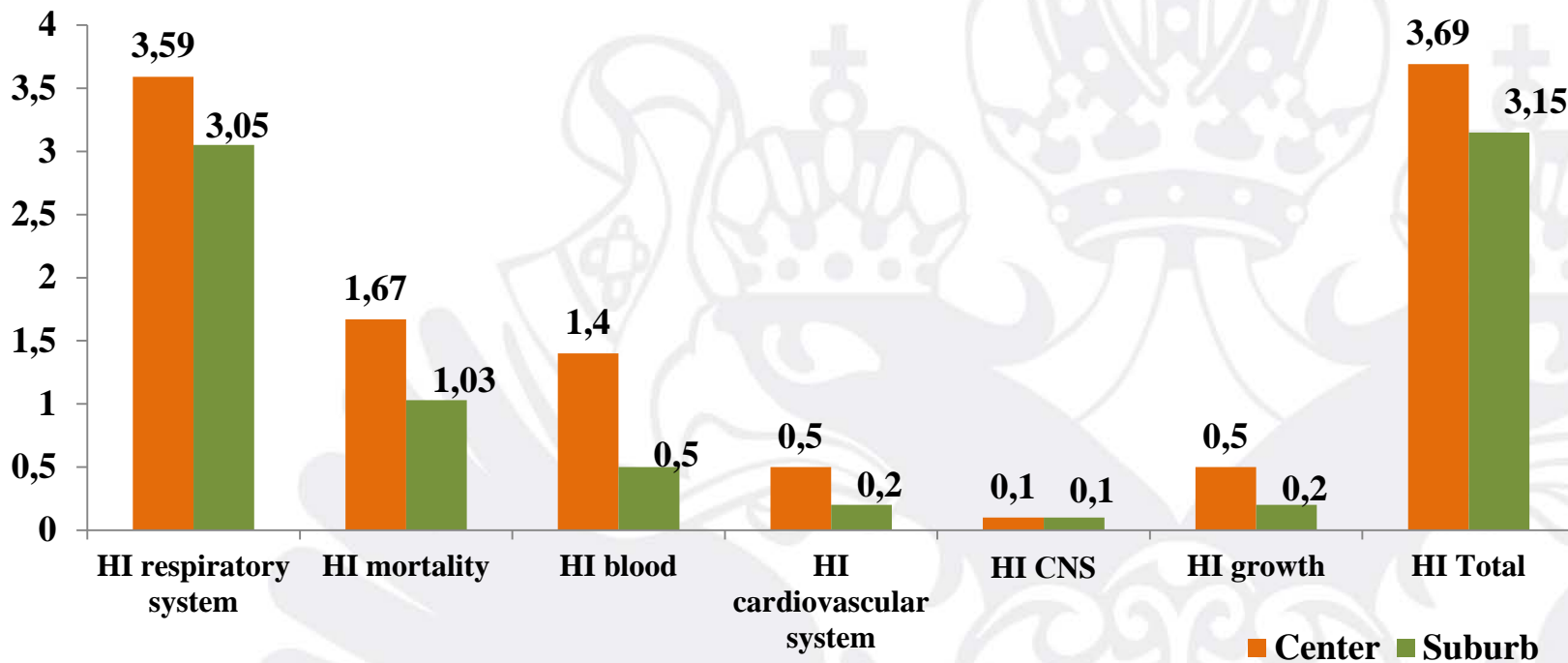


Fig. 2 Assessment of non-carcinogenic risk in St. Petersburg, 2013



Table 1

*The structure of the incidence in 2014 of the children's population of the
Kolpinsky and Petrodvortsovy districts*

Nosological group, diseases of:	<i>Petrodvortsovy district</i>		<i>Kolpinsky district</i>	
	Number of cases per 1000	Specific weight, %	Number of cases per 1000	Specific weight, %
Respiratory system	1443,4	70,1	1392,8	64,2
Digestive system	108,4	5,3	145,1	6,7
Nervous system	70,7	3,4	164,5	7,6
Skin and subcutaneous tissue	113,1	5,5	127,7	5,9
Genitourinary system	44,7	2,2	63,4	2,9
Musculoskeletal system	97,9	4,8	81,4	3,8
Endocrine system, metabolic disorders	43,1	2,1	32	1,5
Blood and blood-forming organs	10,8	0,5	13,5	0,6
Neoplasms	10,8	0,5	18,3	0,8
Circulatory system	5,4	0,3	8	0,4
Infectious and parasitic	109,9	5,3	121,3	5,6
Total	2058,1	100	2168	100



Table 2

The structure of the main nosological groups of the children's population (0-14 years) of Kolpinsky and Petrodvortsovy districts of St. Petersburg in 2014

Nosological group, diseases of:	<i>Petrodvortsovy district</i>	<i>Kolpinsky district</i>
	Number of cases per 1000	Number of cases per 1000
Respiratory system:	1443	1393
Acute respiratory infections of the upper respiratory tract	1348	1290
Acute respiratory infections of the lower respiratory tract	33,9	39,1
Asthma, asthmatic status	17,7	17,3
Nervous system:	70,7	164,5
Disorders of the autonomic nervous system	15,6	25,3
Digestive system:	108,4	145,1
Gastritis and duodenitis	16,7	26,7
Hernia	7,4	36,5
Diseases of the gallbladder, biliary tract	22,2	10



Detection and correction of disorders of the mineral metabolism of the human body (registered by the Federal Service for Supervision in Health and Social Development, No. FS-2007/128).





Table 3

Elemental composition of children's bioassays in Metallostroy and Lomonosov, mg / kg. (The research was carried out using the Resource Center of the Research Park of St. Petersburg State University «Chemistry educational center»).

Element	Metallostroy (n=74)			Lomonosov (n=59)		
	min	max	Average	min	max	Average
Calcium	«-»	3345	1031	364	6795	1981
Cadmium	«-»	«-»	«-»	«-»	8,7	1,6
Cobalt	0,1	5,4	1,7	«-»	8,4	0,8
Chromium	«-»	«-»	«-»	«-»	0,24	«-»
Copper	2,6	665	174	3,8	117,3	14,4
Iron	77,5	445	180	«-»	4397	139
Potassium	19,5	1480	120	«-»	952	98
Magnesium	123	715	290	49,7	774,7	229
Manganese	«-»	26,8	2,8	«-»	10,8	1,6
Sodium	117	520	239	«-»	665	90,8
Nickel	«-»	4,45	0,3	«-»	106	7,8
Lead	«-»	19,9	0,6	«-»	6,8	1,2
Zinc	63,8	3000	388	21,9	1144	116,3



Results of analyzes of drinking water samples in Kolpino and Petrodvortsovy districts, 2015.

	Metallostroy	Lomonosov	Water quality limits	Unit
pH	6,1	7,33	6-9	pH
Chlorides	1,39	4,84	350	mg/l
Sodium	3,25	5,66	200	-«-
Potassium	0,4	3,9	-	-«-
Ammonium	2,39	0,46	2	-«-
Nitrates	0,36	8,4	45	-«-
Total hardness	1,75	4	7	mole/l eq.
Calcium	5	55,11	400	мг/л
Magnesium	18	15,2	50	-«-
Hydrocarbonates	61	244	-	-«-
Sulphates	-	19	500	-«-
Iron	0,002142	-	0,3	-«-
Lead	0,003486	-	0,03	-«-
Copper	0,0002926	-	1	-«-
Manganese	0,002128	-	0,05	-«-
Cobalt	0,0001148	-	0,1	-«-



Conclusion:

- 1. The relationship between the health of children and the state of the environment is revealed. The level of children's health is lower in the Kolpinsky District.**
- 2. The differences in the chemical composition of children's hair samples from Kolpinsky and Petrodvortsovy Districts is shown.**
- 3. The calcium content in the hair is related to its content in drinking water.**
- 4. To determine the causes of the identified features we plan the assessment of content of the chemical elements in the others fields (soils).**



Thank you for attention!