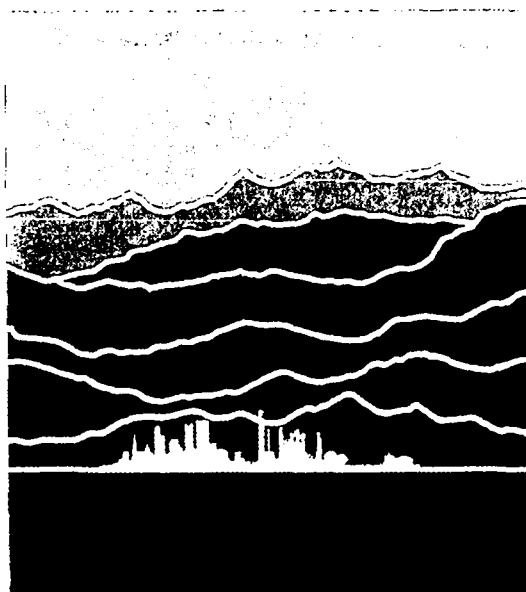




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THE EFFECTS OF ENVIRONMENTAL FACTORS ON THE HEALTH STATUS OF THE POPULATION IN THE EASTERN SLOVAKIA LOWLAND



WORLD HEALTH ORGANIZATION
REGIONAL OFFICE FOR EUROPE

EUROPEAN CENTRE FOR ENVIRONMENT AND HEALTH
BILTHOVEN DIVISION

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Environmental pollution in some regions of Central- and Eastern Europe has reached the point where the data are sufficient to indicate that the health of their inhabitants has deteriorated. In line with the recommendations stemming from the WHO European Charter for Environment and Health, the WHO Regional Office for Europe, through the European Centre for Environment and Health, fosters the dialogue between the respective national authorities responsible for environmental management and public health administration at the national, regional and local level.

Through a Trust Fund arrangement with the Government of The Netherlands, technical assistance activities are carried out by the European Centre for Environment and Health in the form of National Integrated Programmes on Environment and Health with Poland, the Czech Republic, the Slovak Republic and Hungary.

The National Integrated Programmes are addressed to:

- * establish more reliable linkages between environmental factors and the health of affected population groups;
- * improve the quality of monitoring data on food and soil contamination through interlaboratory tests and unified analytical methods; and
- * train chronic disease epidemiologists to deal with the major environmental health problems arising from exposure to environmental contamination.

For further information on the National Integrated Programmes on Environment and Health, please contact:

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Specialized Institute of Hygiene and Epidemiology in Košice

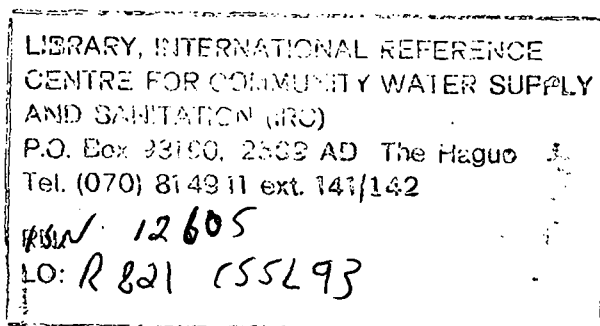
The Effect of Environmental Factors on the Health Status of
Population in the Eastern Slovakia Lowland

Information about the current knowledge

Submitted: MUDr. Olga IVANOVÁ
head of the SIHE Košice

Reason : on the basis of the SIPEH WHO programme

Date : September 1992



The effect of environmental factors on the health status of population in the Eastern Slovakia Lowland

Information about fulfilment according to the universal frame
September 1992

I. General Data

1. Goals:

- to identify the chosen risk factors in working conditions of the plants Chemko Strážske and Bukóza Vranov as well as those in living conditions of the Eastern Slovakia Lowland population.
- to estimate their part in the people health status,
- to determine character, measure and range of environmental pollution in the Eastern Slovakia Lowland (ESL), to propose directed precautions for protection of people health and to determine their priority,
- to improve the methodology of epidemiologic examinations, ecological sanitary monitoring, analytical techniques and information system.

1.1. Characteristics of the territory

The Eastern Slovakia Lowland represents an important part of East Slovakia regarding the hygienic point. Administratively, ESL belongs into the districts Michalovce (Mi), Trebišov (Tv), Vranov nad Topľou (Vv) and Humenné (Hn). The area of the districts is 5,387 km², out of which the ESL represents about 1,600 km², i.e. 30 % predominantly in southern part. 416,000 inhabitants live in these districts. The range mountains Nízke Beskydy and Vihorlat in the north and Slanske vrchy (hills) in the west demarcate the lowland. The lowland continues towards the east and south across the frontiers CSFR to Transcarpathian Ukraine and Hungary.

Originally swampy and flooded territory with high number of streams (Topľa, Ondava, Laborec, Uh, Latorica, Bodrog, Tisa) was the region with endemic incidence of malaria by the end of 50's.

The large hydromelioration treatments (realized till now) and transformation to intensive utilization of agricultural soil created here the second most important agricultural region in Slovakia. Important centres of recreation near water also arose (Zemp-

línska Šírava, Vinianske lake as well as the near basin Veľká Domaša).

Within the 50's and 60's the plants of chemical and wood industry (Chemko Strážske, Bukóza Vranov, Chemlon Humenné) began to be built in the central part along the rivers without appropriate hygienic and ecological precautions for environmental protection. Besides air pollution (dust, SO₂, NO_x, mercaptanes, formaldehyde, PAU, benzene) also a wide contamination of water, soil as well as food-chain with pollutants especially of organic origin - polychlorinated biphenyls (PCB), formaldehyde, nitrogenous compounds and others occurred.

Early in the 70's a large energetic source for solid fuel and mazut - The Power plant - Vojany with chimneys 200 and 300 m high was built here, too.

Contamination of water and soil with agrochemicals and from animal production appears to be of great importance.

For the pollutant spreading it is important that predominant direction of wind is from the north, above sea level rapidly drops from the north towards the south (Streda nad Bodrogom - the lowest region in CSFR), and rivers flow from the north and east towards the south.

On the basis of the present data about risk factors in living and working conditions of ESL, we chose the region where the health of inhabitants may be unfavourably influenced by the specific risk from industrial and agricultural production, i.e. exposed region, and that where these risk factors are not expected, i.e. comparative region. See the map.

Exposed region represents a larger part of the districts Trebišov and Michalovce and the southern parts of the districts Vranov nad Topľou and Humenné. In the region there are 9 towns, 128 villages with about 252,400 inhabitants.

Comparative region is situated in the north-east part of the district Michalovce - the area surrounding the town Sobrance. In this region there are 1 town, 54 villages with about 29,200 inhabitants.

1.2. Above 416,000 inhabitants live in 4 districts reaching into the ESL territory. In exposed region there are about 250,000 inhabitants, what represents about 61 % out of the total number of inhabitants of the given districts.

1.3. The complex clinical-epidemiological study of the people health status in this region has not been done yet. Partial monitoring performed by the former district and regional authorities, LPS (medical second opinion board) and HS as well as comparison of the data published by the medical statistics show especially:

- higher incidence of congenital developmental diseases (e.g. Potter's syndrome),
- nitrate methemoglobinemia in infants,
- increase in the incidence of tumorous diseases,
- higher incidence of respiratory disease (a chosen set of children from the town Strážske situated close to the Chemical works - Chemko Strážske.

The PCB findings in human milk and biological materials indicate the relationship of people exposure to PCB in their environment.

1.4. In the second stage of the project it should be focused on:

a) introducing a monitoring system of air pollution (non-specific and specific contaminants),

- directed monitoring of contamination of water, soil and foodstuffs with foreign substances (PCB, metals, metalloids, nitrogenous compounds) as well as the presence of substances with bio-positive action on the health in these environmental factors (e.g. selenium, etc.)

b) - directed monitoring of the life way of inhabitants (nutrition, alcohol, smoking)

c) - Continuation in monitoring the PCB and heavy metals in human milk, biological and necroptic materials,

- continuation in monitoring the health status of inhabitants with more detailed view to the diseases given in item 1.3.

2. 0. Methods

2.1. In the first phase of our study, the socio-demographic data, data on environmental pollution and the health status of inhabitants have been used.

The socio-demographic data were obtained from individual departments of the Slovak Statistic Office and Institute of Medical Information and Statistics.

The data on the number of inhabitants are for the present pro-

claimed preliminary results for 1991.

The data on the environmental factors were gained predominantly from our measurements performed by the Hygienic service. Supplementing data were given by SHMÚ and Water and Sewerage Works.

The data on the health status of inhabitants were gained as follows:

- a) mortality-rate - from the Slovak registry of the Slovak Statistic Office,
- b) mortality-rate concerning prenatal and postnatal period - from the registry of neonatal departments of hospitals,
- c) data on the disease rate - from the appropriate departments of hospitals.

In tumorous diseases it is a case of preliminary data that are verified in the National Oncologic Institute in Bratislava.

2.2. Specialists from the Institutes of Hygiene and Epidemiology in cooperation with physicians of LPS and specialized departments of SIHE in Košice participated in elaboration of the study. Coordinator of the study is SIHE Košice.

2.3. Data were processed in the 1st and 2nd quarter of 1992.

II. The study scope

3.0. Socio-demographic data and infrastructure of health care

3.1. In exposed region there are 128 municipalities. Out of the total number of inhabitants in this region 252,383 - 40 % live in the country and 60 % in towns. Out of 9 towns 2 have above 30,000 inhabitants, one town above 20,000 and 6 within the range of 4,000 to 10,000.

In comparative region (Sobrance, Michalovce districts) situated in the north-east area of the lowland there are one town with 5,754 inhabitants and 54 villages with 23,478, thus, 80 % inhabitants live in villages.

3.2. Division of inhabitants in the region monitored according to their age and sex is given in tables 3.2.1. and 3.2.2.

3.3. Tables 3.3.1. and 3.3.2. show division of economically active inhabitants according to sectors. From the given review it follows

that in exposed and comparative regions 28 % and 23 % inhabitants are employed in industry, respectively. More inhabitants in comparative region work in agriculture (26 %) than in exposed one (15 %), what is a significant difference.

3.5. Data on the average wages per a month are given in table 3.5. There were available only regional data. The average wage per a month is given on a ^{re} calculation per physical persons and per persons of recalculated state of economically active ones.

3.6. Consumption of alcohol and cigarettes - table 3.6. - data obtained from the Slovak Statistic Office in Košice on the basis of reports from commercial network. They were available only on a recalculation per inhabitants of the East Slovakia region.

Regarding a rather widespread production of wines and distilled liquor in ESL the given data could not be valid.

3.7. Tables 3.7.1., 3.7.2. and 3.7.3. inform about the infrastructure of health care.

4. Analysis of the environmental data

4.1. Air pollution - tab. 4.1.

The largest industrial sources of air pollution are concentrated in the northern part of the region - Bukóza Vranov, Chemko Strážske. Power Plant (PP)-Vojany is situated more southward. A review of emissions from the main sources of air pollution is given in table.

Characteristic of air pollution sources

Sources according to the character of emitted pollutants may be divided into:

a) sources polluting with products of coal burning at production of heat and electric power. The most important are:

- Power plant Vojany - the largest sources of pollution,
- Heating plants: Chemko Strážske, Bukóza Vranov, Chemlon Humenné, Vihorlat Snima, Food works Trebišov.

This group pollutes air with oxides of sulfur, nitrogen, carbon monoxide, ash with toxic metal content (As, Cd) and soot.

b) sources polluting industrial production .

The most important are:

Chemko Strážske - Chemical works - emitting especially cyclohexane, cyclohexanone, benzene, formaldehyde, hydrocarbons, methanol, dust of combined fertilizer NPK, soda dust.

Bukóza Vranov - Wood works - emitting especially hydrogen sulfide, methylmercaptan, dimethylsulfide, dimethyldisulfide, fural, sodium sulfate, calcium sulfate.

Chemlon Humenné - dinityl

Cement works Bystré - cement dust

c) agricultural sources of pollution:

- local air polluting sources especially of smell origin are represented by large-scale fattening pig houses. The main pollutants are: ammonia, mercaptans, hydrogen sulfide.

Commentary to tabular part of the part 4.1.1.

The dust drop is measured by the Institutes of Hygiene and Epidemiology Trebišov and Humenné in the areas of PP VOjany and the town Humenné, respectively.

The most polluted localities appear to be the villages Beša, Drahňov, V.Kapušany, Vojany, where portion of overlimited values represents 20-40 %. It is a case of vicinity of power plant that is influenced by the secondary dustiness from the dry parts of ash matter storage under windy conditions. In the selected checkpoints the metal content (Pb, Cd, V) in dust drop was monitored. Their limiting values has not been exceeded (according to the limits valid in Germany).

In the checkpoints in Humenné exceeding of NPK occurred only in 2 % results.

Concentrations of SO_2 and NO_x were monitored in the northern part of the ESL territory - close to the plants Chemko Strážské, Chemlon Humenné and Bukóza Vranov. Overlimits of allowed values have been recorded in SO_2 in Vranov nad Topľou and in NO_x at the village Dlhé Klčovo.

It is necessary to mention that results in most cases have not been gained by the continual measurement; only at certain time intervals. An exception appears to be results of HMÚ from the area Strážske. The data about performed measurements are given in tabular review.

Measurements of specific pollution were carried out only in the area close to the plant Bukóza Vranov nad Topľou. Sulfur-containing compounds (hydrogen sulfide, methylmercaptan, dimethylsulfide) were measured. It was a discontinual, short-term determination of concentrations during January - October 1991.

Measurement were carried out by the Research Institute for Petrochemistry in Prievidza. Overlimits of allowed values for dimethylsulfide has been found in all localities, whereas with exception of one locality (Nižný Hrušov) the sample numbers above NPK represented 33-100 %.

It is necessary to state that results of measurements of air pollution (amount of contaminants, time realization of measurements) appear to be insufficient for objective estimation of effects on environment in such significant sources as the PP Vojany, Chemko Strážske and Bukóza Vranov nad Topľou. Especially, in a case of the latter two, interactions of various organic substances emitted in air from production processes and subsequent rise of more toxic contaminants could not be excluded.

4.2. Drinking water supply and its quality

4.2.1. Table

4.2.2. Drinking water quality in relation to the Czechoslovak State Norm 75-7111 - Drinking water (1987-1991)

In East Slovakia Lowland there is a shortage of drinking water of satisfactory quality. Underground waters could not be used without any treatment for excessive content of Fe, Mn and nitrogenous compounds. Infiltrated water, especially in the vicinity zone of the rivers Laborec and Ondava, was contaminated with industrial waste waters: Chemko Humenné - caprolactan, Chemko Strážske - PCB, formaldehyde, cyclosubstances, nitrogenous compounds, Bukóza Vranov nad Topľou - sulfite extracts.

After construction of sewage treatment plant and precautions in production technology, pollution decreased, but some risks last.

In individual wells at villages the main problem appears to be in nitrates with the risk of the infantile methemoglobinemia rise ($500 \text{ mg NO}_3 \cdot \text{l}^{-1}$).

68.1 % inhabitants (out of which 91.3 % in towns and 33.8 % at villages) are laid on the public water-main in exposed region. In comparative region (Sobrance, Michalovce district) 45.5 % inha-

bitants are laid on the public water-main , out of which 100 % in towns (Sobrance) and 32.2 % at villages.

Main water-mains . in exposed region

- a) group water-main Starina - Košice. The source of drinking water is the water storage reservoir Starina (600 l.s^{-1}), which supplies especially the town Humenné and adjacent villages as well as the town Vranov nad Topľou (in the case of putting the water main for this town out of operation due to pollution of the Ondava river). There is soft water.
- b) water-main for the town Vranov nad Topľou - the water source is the Ondava river, however often contaminated from the agriculture as well as from housing quarters. It is a case of soft water with frequent microbiological defectiveness due to insufficient disinfection of treated water.
- c) water-main for the town Strážské - from the Laborec river - soft treated water.
- d) water-main Michalovce - Zemplínska Šírava - water sources are wells in the riverside zone of the Laborec river with a potential risk of industrial pollution with overlimited values of Fe and Mn in the water supply network.
- e) Boľansko-Pobodrožský group water-main . It supplies 3 towns (Kráľovský Chlmec, Veľké kapušany, Čierna nad Tisou) and 27 villages. Water sources are the wells situated in the riverside zone of the Latorica nad Bodrog rivers. Underground water sources are in the town Slovenské Nové Mesto. Water is mixed, treated, and overlimited values of Fe, Mn, nitrates and oil substances are determined (1987-90). In 1991 improvement of water treatment occurred.
- f) group water-main Božčice - Sečovce - Trebišov supplies 5 municipalities, out of them 2 towns - Trebišov, Sečovce: The water quality is not satisfactory for Fe, Mn and nitrate contents.

All the given water supplies supply inhabitants with treated water!

In exposed region there are another five municipal water-mains (Brekov, Drahňov, Oborín-Kucany, Sírnik, Stankovce). Except for the water-main Stankovce, the other ones supply water with overlimited values of Fe, Mn and NO_3 .

In exposed region all 9 towns (Humenné, Michalovce, Strážské, Trebišov, Kráľovský Chlmec, Veľké kapušany, Čierna nad Tisou, Sečovce, Vranov na Topľou) are laid on the municipal water main. Out of 128 villages only 46 ones are laid on the municipal water-main and 82 villages are supplied from individual sources, predominantly with hygienically defective water, i.e. microbiologically and chemically (NO_3 , Fe, Mn).

In comparative region the water supply differs from that in exposed region - towns (1) are supplied only with underground water without treatment, however in total, only 45.5 % inhabitants are laid on the municipal water-main.

- out of 54 villages 26 ones are laid on the water main. Supplying of 28 villages with drinking water is from individual sources.

4.3. A hygienic standard in permanently inhabited flats - table 4.3.

5.0. Data on the health status of inhabitants

5.1. Standardized gross mortality-rate is not the same in the whole region monitored.

Statistically significant difference against the standard population of Slovak Republic has been found in exposed region of the Trebišov district as in men as in women.

Table 5.1.

Specific mortality-rate is elaborated according to diagnostic groups MKCH, however, has not been evaluated yet. Evaluation will be given in the report by 31st December 1992.

5.2. No statistically significant differences have been found in the parameters observed - infantile, early and neonatal death-rate, the number of stillborn children as well as incidence of congenital diseases found at birth in both exposed and comparative regions.

Table 5.2.

5.3. In table 5.2. the numbers of children with low birth weight are given. Statistically significant difference has been found in the East Slovakia Lowland, but to the detriment of the children from comparative region against those from exposed one.

5.5. Based upon the tabular review about infectious diseases (tab. 5.5.) it follows that in 1991 there were relatively large variations in the incidence of Dg among exposed areas of individual districts

as well as among comparative areas.

Responsible evaluation of people would be possible after completing reviews at least for last 5 years. It will be supplemented in the final report.

5.6. Incidence of occupational diseases in both exposed and comparative regions is given in tables.

Comparison of the incidence of occupational diseases in both regions showed 2.87-fold higher incidence of these diseases in comparative region. This fact is related with the different ratio of urban and rural inhabitants in these regions.

- in exposed region rural inhabitants (economically active) represent 38.4 %,

- in comparative region rural inhabitants (economically active) represent 78 %.

Moreover, in rural inhabitants 8.1-fold higher incidence of zoonoses (especially trichophytosis and tubercula mulgencia in agricultural workers) and 4.1-fold higher incidence of other occupational diseases (especially bronchial asthma in agricultural workers) have been recorded.

5.7. Incidence of selected diseases

5.7.1. A review about the incidence of malignant tumors in 1991 is given in table 5.7.1.

Data from the district Trebišov - exposed inhabitants are not given. They will be supplemented in the next report.

From the data given in the table it follows that incidence of ZN in both exposed and comparative regions appears to be higher in rural inhabitants in comparison with urban ones.

Regarding the preliminary character of given data the statistical evaluation will be possible in the next stage of our study by standardization of incidence during several years backwards.

5.7.2. Chronic bronchitis, asthma, pollinosis

The data in table 5.7.2. were elaborated on the basis of the reports of specialists of LPK (medical second opinion board).

From the table it follows that the incidence of all three diseases is significantly higher in exposed region of Michalovce district than in other districts.

In remaining districts of exposed region, except for Trebišov, the incidence appears to be higher than in comparative region.

This is a fact that a lot of cases of these diseases are recorded in physicians of the first contact and not in specialized departments. E.g. in the table in the Vranov nad Topľou district the numbers of diseases given by physicians of the first contact differ from those given by the specialized departments. Except for bronchitis the total number by 31st December 1991: 663 cases, asthma 165, pollinosis 100.

From above mentioned it follows that in the next period it would be necessary to correct these data to be the most objective.

6.0. The list of studies on the health status monitoring in relationship to environmental factors performed in the region monitored is in separate supplement.

These are works performed by workers of the Institutes of Hygiene and Epidemiology in given districts, SIHE as well as by workers of therapeutico-prophylactic departments. It is a case of works published, but also cumulative works submitted to the Government of SR, Ministry of Health SR or other authorities.

Review of the work orientation:

- 9 works solve the problem of environmental contamination and its effect on the health status of inhabitants. The problem of PCB prevails,
- 9 works are orientated to the problem of the health status of children population in exposed region,
- 8 works are in the field of occupational medicine (especially Chemlon Humenné and Chemko Strážské)
- 15 works - from clinical departments

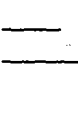
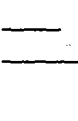
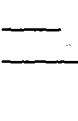
Elaborated: MUDr. M. Michalus, SIHE, Košice
coordinator of the project

- based upon the data from IHE and individual departments
od SIHE Košice

September 1992

Legends to the map and tables

Map - Project of East Slovakia Lowland
borders of the exposed and comparative regions

Legend:  exposed region
 comparative region
 main sources of pollution

Hunagary

Tab.3.1.: Number and territorial division of inhabitants in the
monitored region of East Slovakia Lowland (data from
census for 1991)

District	Exposed region			Comparative region		
	Number towns	villages	Number of inhabitants town villa ges total	Number towns	villa-towns ges	Number of inhab. villa- total ges

Total

Elaborated: SIHE Košice, ODaVTI

Tab.3.2.1.: Number of inhabitants in exposed region according to
sex and age (data from census for 1991)

Age group	District Humenné		District Michalovce		District Trebišov		Dist- rict V
	towns	villages		towns	villages	towns	villages	

Total

Elaborated: SIHE Košice, ODaVTI

Tab. 3.2.2.: Number of inhabitants in comparative region according
to sex and age (data from census for 1991)

Age group	Michalovce district		Total
	towns	villages	

Total

Elaborated: SIHE Košice, ODaVTI

Tab. 3.3.1.: Division of economically active inhabitants according to sectors for towns and villages in the ESL exposed region

	Humenné		Michalovce	
	towns	villages	towns	villages
Number:				
Sectors: men women total leaving				
Agriculture				
Forestry and water supplies management				
Industry				
Building industry				
Transport and postal and telecommunication services				
Business and other production activities				
Science, research and development				
Housing management municipal services				
Education				
Culture and health services				
Other non-production activities				
without statement				
Total				
SIHE Košice				

Continuation of table 3.3.1.

	Trebišov		Vranov	
	towns	villages	towns	villages
Heslá ako hore				

Tab.: 3.3.2.: Division of economically active inhabitants according to sectors in towns and villages of the ESL monitored region

	Exposed region			Comparative region		
	towns	villages	total	towns	villages	total
Number						
Sectors men women total ...						
Agriculture						
Forestry and water supplies management						

Tab.3.3.2. - pokračovanie

Industry
 Building industry
 Transport and postal and
 telecommunication services
 Business and other
 production activities
 Science, research and
 development
 Housing management
 municipal services
 Education
 Culture and health services
 Onther non-production activities
 Without statement
 Total
 SIHE Košice

Tab.: 3.5

The average wage per a moth in Crowns for 1991 - selected dostricts

Dist- rict	Sectors Total	agriculture - Farms	industry Total	non-production sectors
	re-calculated numbers	physical persons	

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 Department HŽP

Tab.: 3.6.: Consumption of alcohol and cigarettes in ESL for
 1981, 1989, 1990

Year	Graped wine in hl	other wines, mead, spirits, distilled liquor, per 1 inhabitant in l	Ciga- rett es in 1,000 pieces per 1 person in 1,000 pie- ces
		

SIHE Košice
 Department HŽP

Tab. 3.7.1.: Infrastructure of health care in 1991 in the districts participated in SIPEH WHO (medical positions)

District	Out-patients departments	Hospitals	medical positions - totally
	Total data	med.pos./ 1,000 inhab.	inhab.numb./ 1 med.posit.

+ Totally = out-patients care, hospital care, SVLZ (common examination and curing sections), hospitals, management, hygienic service

Commentary: significant differences in hospital care are due to zoning of health services valid till now. Due to the utilization of instrumentation, bed-capacity and qualified staff there have not been established all hospital departments in each district. These services are secured by the valid zoning. Specialized services are rendered in teaching hospitals of the region. The district Vranov nad Topľou is the latest and youngest, and there is unfinished construction of hospital.

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Department HŽP

Tab.3.7.2.: Infrastructure of health care in 1991 in the districts of ESL participated in SIPEH WHO (medical staffs)

District	Out-patient departments	Hospitals	Total
	Total data	per 1,000 inhabit.	per 1 medical position

+ Total = out-patients care, hospital care, SVZL (common examination and curing sections), hospitals, management, hygienic service.

Commentary to the differences in hospital care as in table 3.7.1.

SZP - nurses- pediatric, gynecologic, dietetic, social, rehabilitation specialists, assistants of HS, lab-technicians pharmaceutical, radiological, dental, supervisors.

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Tab.3.7.3.: Infrastructure of health care in 1991 in the districts of ESL participated in SIPEH WHO (the number of beds in hospitals

District	total data	in Hospitals	
		per 1,000 inhabit.	per 1 medical position

+ including SVLZ (common examination od curing sections)

Commentary to the differences in the numbers of beds as in table 3.7.1.

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Tab.4.1.1.1.: Results of dust drop measurements in the localities of ESL

tolerable value - $12.5 \text{ g m}^{-2}/30 \text{ days}$

Area year	Place of measurement	Arithmetical means	Range of values		% samp- les abo- ve NPK
			min	max	

PP Vojany

district Vojany

1991

Chemlon Humenné

District Humenné

1991

SIHE Košice

Department HŽP

Tab.4.1.1.2.: The metal contents in dust drop in the localities of ESL

annual average in re-calculation - $(\text{ug.m}^{-2}/1 \text{ month})$

Lead - Pb

Area Year	Site of measurement	Arithmetical mean from all measure- ments
--------------	------------------------	--

PP Vojany

District Trebišov

1991

Tab.4.1.1.2 - pokračovanie

Cadmium - Cd

Area	Site of measurement	Arithmetical mean of all measurements
------	---------------------	---------------------------------------

PP Vojany

district Trebišov

1991

Vanadium - V

Area	Site of measurement	Arithmetical mean of all measurements
------	---------------------	---------------------------------------

PP Vojany

district Trebišov

1991

SIHE Košice

Department HŽP

Tab.4.1.1.3.: Results of measurements of sulfur oxide concentrations in the ESL localities

SO₂, 24 hour means NPK = 150 ug.m⁻³
 The value recommended by WHO = 125 ug.m⁻³

Area	Site of measurement	Arithmetical means	Value range min max	% of samples above NPK
------	---------------------	--------------------	-----------------------------	---------------------------

SIHE Košice

Department HŽP

Tab.4.1.1.4.: Results of measurement of nitrogen oxides in the ESL localities

NO₂, 24 hour means NPK= 100 ug.m⁻³
 The value recommended by WHO = 150 ug.m⁻³

Area	Site of measurement	Arithmetical means	Value range min max	% of samples above NPK
------	---------------------	--------------------	-----------------------------	---------------------------

SIH Košice

Department HŽP

Tab. 4.1.1.5.: Results of measurements of specific pollutants
in the ESL localities

H₂S (hydrogensulfide)

$$K_{\max} = 8 \text{ ug.m}^{-3} \quad K_d = 8 \text{ ug.m}^{-3}$$

Area Year	Site of measurement	Arithmetical means	Value range min max	% of samples above NPK
--------------	---------------------	-----------------------	------------------------	---------------------------

CH₃SH (methylmercaptane)

Area Year	Site of measurement	Arithmetical means	Value range min max	% of sam- ples above NPK
--------------	---------------------	--------------------	------------------------	--------------------------------

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CH₃SSCH₃ (dimethyldisulfide)

Area Year	Site of measurement	Arithmetical means	Value range min max	% of samples above NPK
--------------	---------------------	-----------------------	------------------------	---------------------------

CH₃SCH₃ (dimethylsulfide)

Area Year	Site of measurement	Arithmetical means	Value range min max	% of samples above NPK
--------------	---------------------	-----------------------	------------------------	---------------------------

SIHE Košice

Department HŽP

Tab.4.1.1.6.: Data on measurements of SO₂ and NO_x in the East Slovakia
Lowland

Pollutant Year	Area (district)	Measurement performed by	Notes
			1-2 measurements in heating pe- riod measurements 1x per 2 weeks measurements within the period 15.10.1990-14.9.1991, other data are not given other data are not given
SO ₂			1-2 measurements in heating periods measurements 1x per 2 weeks data obtained from the plant measurements with cont.apparatus other data are not given
	SIHE Košice		

Tab.4.2.1.:Inhabitants laid on the municipal water main in both exposed and comparative regions

Exposed region

Number	District	Inhabitants laid on the municipal water-main		
		towns	villages	the whole region
		inhab.number	%	...

Comparative region

SIHE Košice
Department HŽP

Tab.4.3.: The hygienic standard of permanently inhabited flats (households) in both exposed and comparative regions

Exposed region

	Households	urban	Households	rural	households together
District	Floor space per inhab. m ²	Heating central	Gas connection other	Decanализation public sink	Dry toilet

Total

Comparative region

SIHE Košice
Department HŽP

Tab.5.1.: A standardized mortality-rate (in per-mille) in both exposed and comparative regions of ESL in 1991

	Exposed region			
District	Towns		Villages	
	Men	Women	Men	Women

	Comparative region			
District	Towns		Villages	
	Men	Women	Men	Women

Notice: Relative numbers are standardized to the Slovak population

Elaborated by: SIHE Košice, ODaVTI

Tab. 5.6.2.: The number of occupational diseases (CHP) in inhabitants of the ESL exposed and comparative regions during 1987-1991

Number:	Number of occupational diseases	Exposed region			Comparative region		
		Town	Village	Total	Town	Village	Total
1	absolute number CHP						
	Prevalence of CHP per 100,000 inhabitants						

Notice: The calculation of CHP prevalence was based upon the number of economically active inhabitants obtained from the census in 1991

Elaborated by: SIHE Košice, PPL

Tab. 5.6.3.: The number of occupational diseases according to diagnostic groups in inhabitants living in both exposed and comparative regions of ESL during 1987-1991

Diagnostic group	Number of CHP in exposed region			Number of CHP in comparative region	
	Absolute number	Prevalence per 100,000 inhabit.		Absolute number	Prevalence per 100,000 inhabitants
	Town	Village	Total		
Intoxications					
Dermal diseases					
Infections contagious from man to man					
Zoonoses					
Hypacusis					
Diseases from vibrations					

Tab.5.2. A survey about the numbers of live-birth, still-birth children, infantile, early and neonatal death-rate, numbers of children with low birth weigh, and incidence of congenital developmental diseases in absolute numbers and re-calculation per 1,000 live-birth in the ESL exposed and comparative regions

Area	Number of live-birth	Infantile death-rate by 1 yr	Early mortality (by 7 days)	Neonatal death-rate (by 28 days)	Number of still-birth	Number with NPH (to 2,500 g)	Incidence of congenital developmental diseases
------	----------------------	------------------------------	-----------------------------	----------------------------------	-----------------------	------------------------------	--

Elaborated by: SIHE Košice, HDD

Tab.5.5.: Incidence of chosen infectious diseases in both exposed and comparative regions of ESL in 1991

Diagnosis	Exposed region	Comparative region
-----------	----------------	--------------------

Elaborated by: SIHE Košice, ODaVTI

Tab.5.6.1.: A survey of occupational diseases according to plants in both exposed and comparative regions of ESL during 1987-1991

Region	Intoxication	Dermal diseases	Infections contagious from man to man	Zoonoses	Hypacusis	Diseases from vibrations	Silicosis	Other IPZ CHP	Total
--------	--------------	-----------------	---------------------------------------	----------	-----------	--------------------------	-----------	---------------	-------

A. Exposed region

Together: towns
villages
towns + villages

B. Comparative region

Together: towns
villages
towns + villages

Elaborated by : SIHE Košice, PPL

Pokračovanie Tab. 5.6.1.

Silicosis

Other CHP

IPZ

Total

Notice: The calculation of CHP prevalence was based upon the number of economically active inhabitants obtained from the census in 1991

CHP - occupational diseases

Elaborated by: SIHE Košice, PPL

Tab. 5.7.1.: Incidence of malignant tumors in both exposed and comparative regions of ESL in 1991

District	Exposed region			
	Towns		Villages	
	Men	Women	Me	Women

+ data on the level of ÚHE, now processed

District	Comparative region			
	Towns		Villages	
	Men	Women	Men	Women

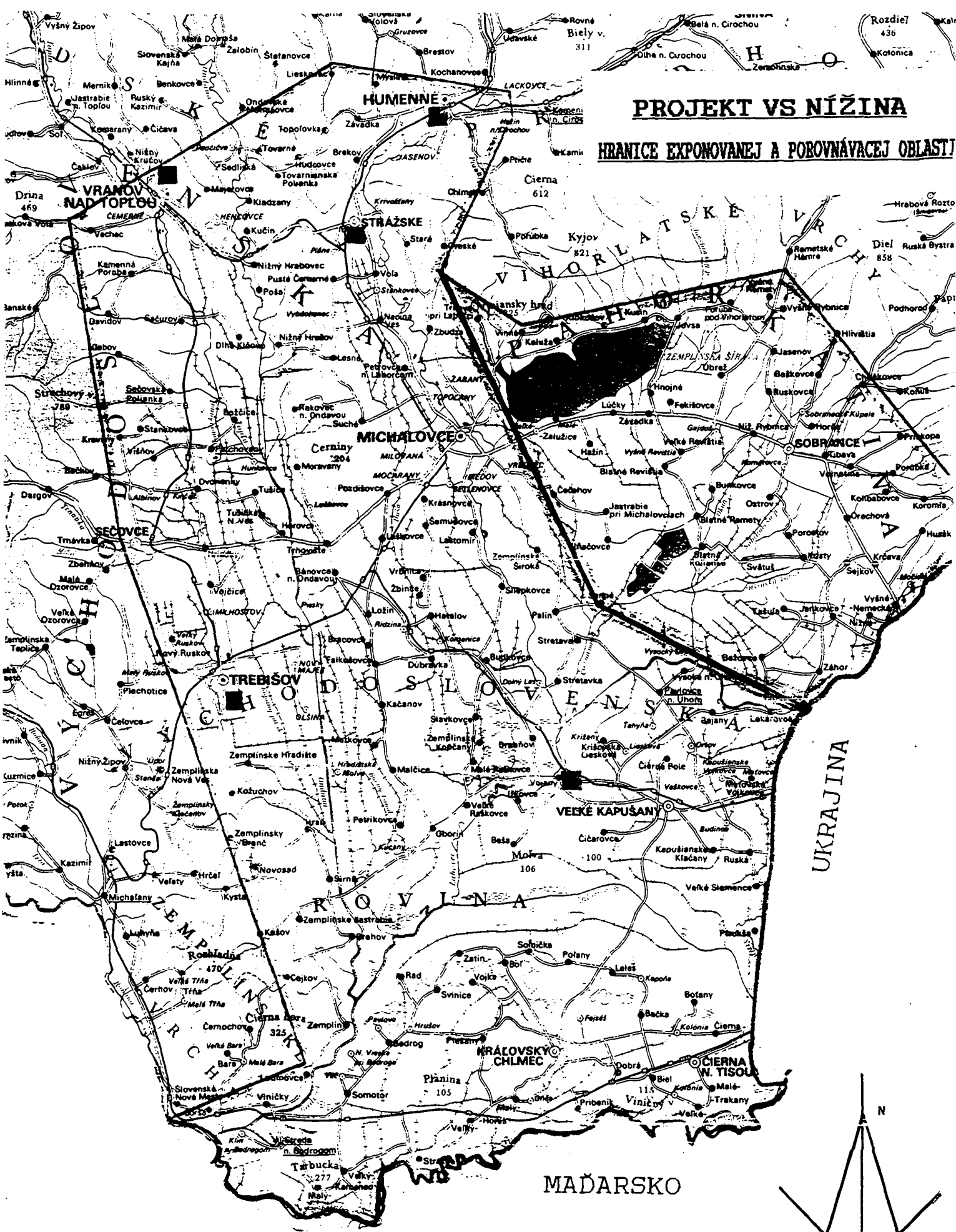
Notice: Relative numbers are related to 100,000 inhabitants of appropriate group

Elaborated by: SIHE, OdaVTI

Tab. 5.7.2.: Incidence of chronic bronchitis, asthma a pollinosis in the monitored region of ESL according to districts by 31st December 1991(absolute and relative data per 100,000 inhabitants)

District	Exposed region			Comparative region		
	Chron-bronch.	Asthma	Pollinosis	Chron-bronch.	Asthma	Pollinosis
Total						

Elaborated by: SIHE Košice, ODaVTI

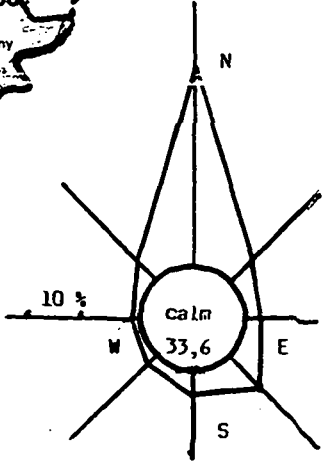


PROJEKT VS NÍŽINA

HRANICE EXPOVANEJ A POROVNÁVACEJ OBLASTI

Legenda:

- exponovaná oblasť
- porovnávacía oblasť



**Počet a teritoriálne rozdelenie obyvateľstva v sledovanej
oblasti VSN (údaje z cenzu za rok 1991)**

OKRES	EXPONOVANÁ OBLASŤ					POROVNÁVACIA OBLASŤ				
	POČET		POČET OBYVATEĽOV			POČET		POČET OBYVATEĽOV		
	MIEST	OBCÍ	MIEST	OBCÍ	SPOLU	MIEST	OBCÍ	MIEST	OBCÍ	SPOLU
HUMENNÉ	1	7	36298	4441	40739					
MICHA- LOVCE	2	46	43078	36655	79733	1	54	5754	23478	29232
TREBIŠOV	5	61	48492	44493	92985					
VRANOV	1	14	22687	16239	38926					
SPOLU	9	128	150555	101828	252383	1	54	5754	23478	29232

Spracoval: ŠÚHE Košice, ODAVTI

Počet obyvateľstva v exponovanej oblasti podľa pohlavia a veku (údaje z cenzu za rok 1991)

VEKOVÁ SKUPINA	OKRES HUMENNÉ				OKRES NICHALOVCE				OKRES TREBIŠOV				OKRES VRANDV				SPOLU
	MESTÁ		OBCE		MESTÁ		OBCE		MESTÁ		OBCE		MESTÁ		OBCE		
	M	Ž	M	Ž	M	Ž	M	Ž	M	Ž	M	Ž	M	Ž	M	Ž	
0 - 4	1807	1629	147	184	2006	1896	1289	1233	2303	2360	1485	1472	1145	1090	698	662	21406
5 - 9	1782	1740	186	164	2271	2179	1439	1344	2781	2496	1627	1659	1303	1217	759	724	23671
10 - 14	1816	1727	228	201	2122	2096	1608	1495	2568	2555	1695	1642	1183	1151	829	787	23703
15 - 19	1529	1566	221	202	1785	1802	1550	1617	2146	2109	1877	1810	952	950	744	697	21557
20 - 24	1216	1358	188	146	1364	1510	1354	1221	1602	1733	1687	1365	733	865	610	573	17525
25 - 29	1539	1584	147	121	1794	1970	1241	1061	1940	2134	1650	1341	941	976	579	510	19528
30 - 34	1628	1592	152	133	2000	2105	1234	1073	2362	2419	1690	1457	1000	1008	574	496	20922
35 - 39	1529	1609	148	165	1942	1887	1171	1203	2308	2132	1581	1396	948	925	542	540	20026
40 - 44	1272	1959	170	149	1578	1546	1163	1111	1559	1556	1211	1197	710	650	455	427	16713
45 - 49	832	917	113	114	956	1043	815	920	949	1009	1039	1297	429	470	349	401	11653
50 - 54	671	866	93	114	772	900	777	999	816	1034	1152	1389	403	470	329	414	11199
55 - 59	658	695	107	121	689	839	958	1207	841	959	1275	1561	376	464	379	413	11542
60 - 64	491	492	106	127	632	700	998	1218	721	878	1228	1536	332	386	351	385	10581
65 - 69	361	451	83	108	481	659	898	1290	588	793	1130	1511	276	512	306	437	9884
70 - 74	169	208	40	67	247	339	471	657	248	390	519	817	132	180	344	218	5046
75 -	229	376	73	123	321	647	748	1292	77	127	734	1463	195	315	273	434	7427
SPOLU	17529	18769	2202	2239	20960	22118	17714	18941	23809	24683	21580	22913	11058	11629	8121	8118	252383

Spracoval: ŠÚHE Košice, ODaVTI

Počet obyvateľstva v porovnávacej oblasti podľa pohlavia a veku
(údaje z cenzu za rok 1991)

VEKOVÁ SKUPINA	OKRES MICHALOVCE				SPOLU
	MESTÁ		OBCE		
	M	Ž	M	Ž	
0 - 4	313	310	736	662	2021
5 - 9	288	292	785	737	2102
10 - 14	289	252	894	852	2287
15 - 19	215	234	993	938	2380
20 - 24	209	247	801	722	1979
25 - 29	280	271	787	617	1955
30 - 34	243	254	797	682	1976
35 - 39	244	214	788	682	1928
40 - 44	177	167	735	726	1805
45 - 49	122	124	584	610	1440
50 - 54	94	129	518	653	1394
55 - 59	94	116	603	808	1621
60 - 64	97	112	659	821	1689
65 - 69	76	91	749	1021	1937
70 - 74	26	47	374	510	957
75 -	47	80	662	972	1761
SPOLU	2814	2940	11465	12013	29232

Spracoval: ŠÚHE Košice, ODaVTI

Tab.: 3.3.1

Členenie obyvateľstva ekonomicky aktívneho podľa odvetví za obce a mestá exponovanej oblasti VSN

	H U M E N N É								M I C H A L O V C E							
	m e s t á				o b c e				m e s t á				o b c e			
počet:	1				7				2				46			
odvetvia:	muži	ženy	spolu	z toho odchád.	muži	ženy	spolu	z toho odchád.	muži	ženy	spolu	z toho odchád.	muži	ženy	spolu	z toho odchád.
Poľnohospodárstvo	760	267	2027		225	191	416		1375	613	1988	1186	2583	1732	4315	1718
Lesné a vod. hospodárstvo	277	48	325		24	12	36		183	56	239	60	151	78	229	151
Priemysel	3531	3199	6730		668	447	1115		3876	3318	7194	1299	2409	1987	4396	4018
Stavebníctvo	1676	485	2161		246	62	308		1940	727	2667	363	1802	283	2085	1809
Doprava a spoje	642	337	979		86	42	128		498	271	769	105	464	209	673	592
Obchod a iné výr.činnosti	448	1134	1582		38	188	226		567	1318	1885	223	335	943	1278	995
Veda, výskum a vývoj	15	9	24		0	1	1		42	51	93	19	14	19	33	24
Byt. hospod. kom. služby	323	278	601		30	35	65		468	396	864	83	232	147	379	244
Školstvo, kult. a zdrav	595	2360	2955		41	190	231		824	2748	3572	475	232	1104	1336	953
Ostat. nevyr. činnosti	547	480	1027		47	62	109		702	639	1341	242	273	321	594	416
Bez udania	306	276	582		47	28	75		744	492	1236	85	591	510	1101	95
S p o l u :	9120	8873	17963		1452	1258	2710		11219	10629	21848	4140	9086	7333	16419	11015

Tab.: 3.3.1
(pokračovanie)

Členenie obyvateľstva ekonomicky aktívneho podľa odvetví za obce a mestá exponovanej oblasti VSN

	T R E B I Š O V								V R A N O V							
	m e s t á				o b c e				m e s t á				o b c e			
počet:	5				61				1				14			
odvetvia:	muži	ženy	spolu	z toho odchád.	muži	ženy	spolu	z toho odchád.	muži	ženy	spolu	z toho odchád.	muži	ženy	spolu	z toho odchád.
Poľnohospodárstvo	1904	879	2783	1065	3492	1991	5483	1670	794	351	1145	691	858	620	1478	636
Lesné a vod. hospodárstvo	243	76	319	74	187	40	227	183	146	54	200	32	108	72	180	132
Priemysel	3268	2433	5701	2157	1778	1554	3332	2910	2235	1956	4191	589	1433	1126	2559	2430
Stavebníctvo	1777	271	1448	508	1220	111	1331	1178	774	114	888	361	796	77	873	840
Doprava a spoje	2472	638	3110	1238	2951	1506	4457	3572	406	201	607	98	287	110	397	355
Obchod a iné výr.činnosti	567	1430	1997	426	311	889	1200	763	190	587	777	107	115	324	439	342
Veda, výskum a vývoj	13	9	22	19	9	11	20	20	9	5	14	8	3	4	7	7
Byt. hospod. kom. služby	661	501	1162	140	242	204	450	384	348	222	570	78	111	94	195	107
Školstvo, kult. a zdrav.	822	2987	3809	745	380	1595	1975	1244	373	1426	1799	286	119	566	685	473
Ostat. nevyr. činnosti	818	593	1411	325	358	301	659	460	311	306	617	104	125	117	242	167
Bez udania	681	656	1337	67	448	403	851	61	115	102	217	13	149	122	271	40
S p o l u :	12626	10473	23099	6764	11380	8605	19985	12445	5701	5324	11025	2367	4104	3232	7326	5529

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Odbor HŽP

Tab.: 3.3.2

Členenie obyvateľstva ekonomicky aktívneho podľa odvetví za obce a mestá sledovanej oblasti VSN

	Exponovaná oblasť						Porovnávacía oblasť							
	mestá			obce			mestá				obce			
počet:	9			128			1				54			
odvetvia:	muži	ženy	spolu	muži	ženy	spolu	muži	ženy	spolu	z toho odchád.	muži	ženy	spolu	z toho odchád.
Poľnohospodárstvo	4.833	2.110	6.943	7.158	4.534	11.692	349	128	477	292	1798	1104	2902	1364
Lesné a vod. hospodárstvo	849	234	1.083	470	202	672	100	21	121	49	288	73	361	263
Priemysel	12.910	10.906	23.816	6.288	5.114	10.287	292	343	635	172	1274	1063	2337	2121
Stavebníctvo	6.167	1.597	7.764	4.064	533	4.597	253	39	292	114	869	168	1037	959
Doprava a spoje	4.018	1.447	5.465	3.788	1.867	5.655	52	28	80	22	259	117	376	338
Obchod a iné výr.činnosti	1.772	4.469	6.241	799	4.211	3.143	84	191	275	80	222	612	834	657
Veda, výskum a vývoj	79	74	153	26	35	61	6	9	15	13	24	30	54	29
Byt. hospod. kom. služby	1.800	1.397	3.197	615	480	1.089	54	46	100	17	170	113	283	210
Školstvo, kult. a zdrav	2.614	9.521	12.135	772	3.455	4.227	106	366	472	118	194	850	1044	810
Ostat. nevyr. činnosti	2.378	2.018	4.396	803	801	1.604	80	71	151	78	207	215	422	278
Bez udania	1.846	1.526	3.372	1.235	1.063	2.298	95	126	221	14	427	288	715	113
S p o l u :	38.666	35.299	74.565	26.018	22.295	46.440	1471	1368	2839	969	5732	4633	10365	7142

Priemerná mesačná mzda v Kčs za rok 1991 - vybrané okresy

Okres	Za sektory spolu		-poľnohospod. - JRD		priemysel celkom		nevýrobné odvetvia	
	prepoč. počty	fyzické osoby	prepoč. počty	fyzické osoby	prepoč. počty	fyzické osoby	prepoč. počty	fyzické osoby
VSK	3.718	3.665	3.485 3.051	3.466 3.043	3.981	3.960	3.726	3.583
HN	3.656	3.634	3.707 2.976	3.692 2.976	3.839	3.829	3.688	3.598
MI	3.604	3.572	3.337 2.775	3.328 2.775	4.023	4.012	3.748	3.620
TV	3.560	3.515	3.464 2.860	3.437 2.846	3.700	3.676	3.830	3.689
VV	3.399	3.558	3.556 3.144	3.523 3.140	3.284	3.276	3.580	3.438

ŠÚHE Košice

Odbor HŽP

Tab. 3.6

Spotřeba alkoholu a cigaret vo VSK v letech 1981, 1989, 1990

Rok	víno révové		ost.vína, medovina		liehov., destiláty		cigarety	
	v hl	na 1 obyv. v l	v hl	na 1 obyv. v l	v hl	na 1 obyv. v l	v 1000 ks	na 1 os. v 1000 ks
1981	111.417	8	22.159	2	197.690	14	2 341.185	1,66
1989	89.740	6	27.542	2	217.454	15	2 119.242	1,41
1990	102.066	7	35.969	2	239.069	16	2 459.900	1,63

ŠÚHE Košice

Odbor HŽP

Infraštruktúra zdravotníckej starostlivosti v r.1991 v okresoch zúčastnených v SIPEH WHO (lekárske miesta)

Okres	lek.m.ambulantné			lek.m. nemocničné			lek.m. spolu *		
	absol. údaje	lek.m. /1000 obyv.	p.obyv. na 1 lek.m.	absol. údaje	lek.m. /1000 obyv.	p.obyv. na 1 lek.m.	absol. údaje	lek.m. /1000 obyv.	p.obyv. na 1 lek.m.
HN	142,00	1,26	793,22	85,39	0,76	1319,09	343,92	3,05	327,51
MI	194,33	1,74	574,94	115,84	1,04	964,51	341,87	3,06	326,82
TV	181,11	1,52	657,37	103,25	0,87	1153,08	309,02	2,60	385,27
VV	121,59	1,65	607,17	40,09	0,54	1841,51	176,50	2,39	418,28

* spolu = ambul.starostlivosť, nem.starostlivosť, SVLZ (spoločné vyšetrovacie a liečebné zložky), liečebne, riadiaci aparát, hygienická služba

Komentár: výrazné rozdiely v nemocničnej starostlivosti sú v dôsledku rajonizácie zdravotníckych služieb, platnej aj v súčasnosti. Z dôvodov využitia prístrojovej techniky, postelovej kapacity i kvalifikovaného personálu sa nezriaďovali v každom okrese všetky nemocničné oddelenia. Zabezpečenie týchto služieb zaručuje platná rajonizácia. Zvlášť špecializované služby sa poskytujú vo Fakultných nemocniciach kraja. Okres Vranov n/T je najmladší a najmenší, má neukončenú výstavbu nemocnice.

ŠÚHE Košice
Odbor HZP

Infraštruktúra zdravotníckej starostlivosti v r. 1991 v okresoch
VSK zúčastnených v SIPEH WHO (strední zdravotnícki pracovníci)

Okres	ambul.starostlivosť			nemoc.starostlivosť			s p o l u *		
	absol. údaje	na 1000 obyv.	na 1 lekár. miesto	absol. údaje	na 1000 obyv.	na 1 lekár. miesto	absol. údaje	na 1000 obyv.	na 1 lekár. miesto
HN	333,32	2,96	2,35	382,00	3,39	4,47	990,10	8,79	2,88
MI	316,19	2,83	1,63	547,46	4,90	4,73	1108,36	9,92	3,24
TV	283,40	2,38	1,56	372,10	3,13	3,60	913,68	7,63	2,96
VV	195,13	2,64	1,60	185,75	2,52	4,63	461,20	6,25	2,61

* spolu = ambulatná starostlivosť, nemocničná starostlivosť, SVLZ (spoločné vyšetrovacie a liečebné zložky), liečebne, ríadiaci aparát, hygienická služba

Komentár k rozdielom v nemocničnej starostlivosti platí z tab. 3.7.1

SZP = zdravotná, detská, ženská, dietna, sociálna sestra, rehabilitační pracovníci, asistenti HS, zdravotnícki, farmaceutickí, radiologickí, zubní laboranti, pracovníci dozoru

Tab. 3.7.3

Infraštruktúra zdravotníckej starostlivosti v r.1991 v okresoch
VSK zúčastnených v SIPEH WHO (počet postelí v nemocniciach)

Okres	v n e m o c n i c i a c h *		
	absolutné údaje	na 1000 obyvateľov	na 1 lekárske miesto
HN	748	6,64	8,76
MI	1.226	10,97	10,58
TV	1.019	8,56	9,87
VV	293	3,97	7,31

* včítane SVLZ (spoločné vyšetrovacie a liečebné zložky)
Komentár k rozdielom v počte postelí platí z tab. 3.7.1

ŠÚHE Košice
Odbor HŽP

Tab.: 4.1.1.1

Výsledky merania prašného spadu v lokalitách VS nížiny

únosná hodnota = 12,5 g.m⁻²/30 dní

Oblasť rok	Meracie miesto	Arit. priem.	Rozpätie hodnôt		% vzor. nad NPK
			min.	max.	
EVO Vojany okres Vojany 1991	Beša	14,91	3,91	48,63	40,00
	Drahňov	8,45	1,95	32,99	20,83
	Veľké Kapušany	7,90	1,78	31,26	22,72
	Čičarovce	4,69	1,88	12,33	0
	Leles	2,99	1,40	5,27	0
	Boľ	4,31	1,61	7,01	0
	Zatín	2,82	1,01	6,28	0
	EVO Vojany	12,31	2,09	44,77	36,36
Chemlon Humenné okres Humenné 1991	Humenné	11.10	5.0	30.6	2.0

ŠÚHE Košice
Odbor HŽP

Obsah kovov v prašnom spade v lokalitách VS nižiny

ročný priemer v prepočte - / $\mu\text{g}\cdot\text{m}^{-2}$ /1 mesiac/

Olovo - Pb

Oblasť rok	Meracie miesto	Aritmet.priemer zo všetkých meraní
EVO Vojany okres Trebišov 1991	Beša	807,1
	Drahňov	1.065,3
	Čičarovce	726,4
	EVO Vojany	972,8

Kadmium - Cd

Oblasť rok	Meracie miesto	Aritmet.priemer zo všetkých meraní
EVO Vojany okres Trebišov 1991	Beša	29,1
	Drahňov	32,3
	Čičarovce	22,7
	EVO Vojany	29,2

Vanád - V

Oblasť rok	Meracie miesto	Aritmet.priemer zo všetkých meraní
EVO Vojany okres Trebišov 1991	Beša	339,9
	Drahňov	254,1
	Čičarovce	319,6
	EVO Vojany	347,7
	V.Kapušany	422,2
	Leles	292,9
	Boľ	301,6
Zatín	206,0	

ŠÚHE Košice
Odbor HŽP

Výsledky merania koncentrácií oxidu siričitého v lokalitách VS nížiny

SO₂, 24 hod. priemery NFK=150 ug.m⁻³
 Hodnota doporučená WHO=125 ug.m⁻³

Oblasť rok	Meracie miesto	Arit. priem.	Rozpätie hodnôt		% vzor. nad NFK
			min.	max.	
Chemlon Humenné okres Humenné 1990	Topoľovka	26,2	11,7	48,8	0
	Závadka	27,7	22,2	33,3	0
	Brekov	36,9	36,2	37,7	0
	Karna	30,2	17,4	43,1	0
	Humenné	21,7	20,9	22,6	0
1991	Humenné	43,5	14,8	112,2	0
	Jasenov	21,7	4,3	61,0	0
Bukóza Vranov okres Vranov 1990	Dlhé Klčovo	26,9	1,0	133,0	0
	Niž.Hrabovec	26,3	10,0	118,0	0
	Vranov	35,4	1,0	996,0	0,98
	Sedliská	25,3	1,0	96,0	
okres Michalovce 1990 1991	Strážske(HMÚ)	10,0	1,0	70,0	0
	Michalovce	6,5	1,0	87,3	0

ŠÚHE Košice
 Odbor HŽP

Výsledky merania oxidov dusíka v lokalitách VS nížiny

NO₂, 24 hod. priemery NPK = 100 ug.m⁻³
 Hodnota doporučená WHO = 150 ug.m⁻³

Oblasť rok	Meracie miesto	Arit. priem.	Rozpätie min.	hodnôt max.	% vzor. nad NPK
Chemlon Humenné okres Humenné 1990	Topoľovka	22,7	14,3	29,2	0
	Závadka	16,4	13,7	19,2	0
	Brekov	18,9	9,9	28,0	0
	Karna	14,5	14,1	14,9	0
	Lieskovec	10,3	9,5	11,2	0
	Humenné	23,8	23,3	24,3	0
1991	Humenné	29,7	12,3	55,3	0
Bukóza Vranov okres Vranov 1991	Dlhé Klčovo	28,7	1,0	125,0	0,78
	Vranov	26,8	1,0	65,0	0
	Sedliská	24,7	1,0	52,0	0
	Niž.Hrabovec	24,8	1,0	68,0	0
Chemko Strážske okres Michalovce 1990 1991	Strážske/HMÚ/ Michalovce	10,0 5,43	1,0 1,0	43,0 32,0	0 0

ŠÚHE Košice
 Odbor HŽP

Výsledky merania špecifických škodlivín v lokalitách VS nížiny

H₂S (sírovodík)

K_{max} = 8 ug.m⁻³ K_d = 8 ug.m⁻³

Oblasť rok	Meracie miesto	Arit. priem.	Rozpätie hodnôt		% vzor. nad NPK
			min.	max.	
Bukóza Vranov okres Vranov 1991	Hencovce	0,493	0,21	1,02	0
	Poša	0,646	0,24	1,16	0
	Niž.Hrušov	0,525	0,31	0,89	0
	Niž.Hrabovec	0,550	0,26	0,97	0
	Dlhé Klčovo	0,827	0,51	1,38	0
	Kladzany	0,676	0,14	1,42	0
	Majerovce	0,680	0,44	1,05	0
	Sedliská	0,580	0,22	1,28	0

CH₃SH (metylmerkaptan)

K_{max} = 0,4 ug.m⁻³ K_d = 0,2 ug.m⁻³

Oblasť rok	Meracie miesto	Arit. priem.	Rozpätie hodnôt		% vzor. nad NPK
			min.	max.	
Bukóza Vranov okres Vranov 1991	Hencovce	0,043	0,04	0,05	0
	Poša	0,120	0,04	0,27	0
	Niž.Hrušov	0,062	0,04	0,08	0
	Niž.Hrabovec	0,043	0,04	0,05	0
	Dlhé Klčovo	0,042	0,04	0,05	0
	Kladzany	0,043	0,04	0,05	0
	Majerovce	0,050	0,04	0,06	0
	Sedliská	0,043	0,04	0,05	0

ŠÚHE Košice
Odbor HŽP

Tab.: 4.1.1.5
pokračovanie

CH_3SSCH_3 (dimetyldisulfid)

$K_{\text{max}} = 0,2 \text{ ug.m}^{-3}$

$K_d = 0,1 \text{ ug.m}^{-3}$

Oblasť rok	Meracie miesto	Arit. priem.	Rozpätie hodnôt		% vzor. nad NPK
			min.	max.	
Bukóza Vranov okres Vranov 1991	Hencovce	2,143	0,16	6,11	100,00
	Poša	0,106	0,03	0,17	66,6
	Niž.Hrušov	0,260	0,05	0,42	7,0
	Niž.Hrabovec	0,186	0,03	0,42	66,6
	Dlhé Klčovo	0,325	0,05	0,74	75,0
	Kladzany	0,296	0,09	0,66	66,6
	Majerovce	0,205	0,09	0,45	50,0
	Sedliská	0,070	0,04	0,11	33,3

CH_3SCH_3 (dimetylsulfid)

$K_{\text{max}} = 2 \text{ ug.m}^{-3}$

$K_d = 1 \text{ ug.m}^{-3}$

Oblasť rok	Meracie miesto	Arit. priem.	Rozpätie hodnôt		% vzor. nad NPK
			min.	max.	
Bukóza Vranov okres Vranov 1991	Hencovce	0,943	0,13	2,68	33,3
	Poša	0,273	0,09	0,56	0
	Niž.Hrušov	0,265	0,06	0,61	0
	Niž.Hrabovec	0,183	0,09	0,35	0
	Dlhé Klčovo	0,252	0,08	0,55	0
	Kladzany	0,513	0,13	1,19	33,3
	Majerovce	0,432	0,15	0,76	0
	Sedliská	0,306	0,05	0,68	0

ŠÚHE Košice
Odbor HŽP

Údaje o meraniach SO₂ a NO_x na Východoslovenskej nížine

Škodlivina rok	Oblasť (okres)	Meranie vykonal	Poznámka
NO _x , 1990 1991	Humenné	ÚHE Humenné ÚHE Humenné	1-2 merania vo vykurovacom období merania 1 x za 2 týždne
1991	Vranov	EKO Leik v.d. Košice	meranie v období 15.10.90 -14.9.91, ďalšie údaje neuve- dené
1991	Michalovce	ÚHE Michalovce	ďalšie údaje neuvedené

SO ₂ , 1990 1991	Humenné	ÚHE Humenné ÚHE Humenné	1-2 merania vo vykurovacom období merania 1 x za 2 týždne
1991		Chemlon, š.p. lok. Jasenov	údaje získané od závodu, merania kont.aparatúrou
1991	Michalovce	ÚHE Michalovce	ďalšie údaje neuvedené

ŠÚHE Košice
Odbor HŽP

Nápojenie obyvateľov v exponovanej a porovnávacej oblasti na verejný vodovod

Exponovaná oblasť

Por. čis.	Okres	Obyvatelia v oblasti napojení na verejný vodovod					
		mestá		obce		oblasť spolu	
		poč.obyv.	%	poč.obyv.	%	poč.obyv.	%
1.	Humenné	34.638	95,4	3.151	70,9	37.789	92,8
2.	Michalovce	43.074	100,0	9.805	26,7	52.879	66,3
3.	Trebišov	40.059	82,6	19.672	44,2	59.731	64,2
4.	Vranov	19.756	87,1	1.792	11,0	21.548	55,6
	Spolu:	137.527	91,3	34.420	33,8	171.947	68,1

Porovnávacia oblasť

1.	Michalovce	5.754	100,0	7.553	32,2	13.307	45,5
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Tab.: 4.3

Hygienická úroveň trvale obývaných bytov (domácností) v exponovanej a porovnávacej oblasti

Exponovaná oblasť

P. č.	Okres	Domácnosti mestské						Domácnosti vidiecke						Domácnosti spolu											
		O byt. plocha na 1 obyv. (m ²)		Vykurovanie		Plyn. prípojka	Odkanalizovanie			O byt. plocha na 1 obyv. (m ²)		Vykurovanie		Plyn. prípojka	Odkanalizovanie			O byt. plocha na 1 obyv. (m ²)		Vykurovanie		Plyn. prípojka	Odkanalizovanie		
		ÚK	Iné	Verej. kanal.	Žumpa		Suché WC	ÚK	Iné	Verej. kanal.	Žumpa	Suché WC	ÚK		Iné	Verej. kanal.	Žumpa	Suché WC	ÚK	Iné	Verej. kanal.		Žumpa	Suché WC	
1.	HN	19,1	9990	363	7274	9969	310	0	17,5	817	587	486	0	1094	366	18,6	10807	950	7760	9969	1404	366			
2.	MI	14,5	11697	1292	12490	12143	692	154	17,0	4204	5256	3331	44	6623	2792	16,9	15901	6548	15821	12187	7315	2946			
3.	TV	13,9	11387	3613	11032	12835	1614	519	17,2	11008	11860	544	569	16495	5772	15,6	22395	15473	11576	13424	18109	6291			
4.	VV	13,9	5335	867	4668	4925	1058	394	14,8	2022	1754	629	208	2379	1767	14,4	7357	2621	5297	5133	3437	2161			
Spolu :		15,3	38409	6135	35464	39892	3674	1067	16,6	18051	19457	4990	821	26591	10697	16,4	56460	25592	40454	40713	30265	11764			

Porovnávacia oblasť

Michalovce	15,3	1181	410	70	1414	121	56	17,6	2423	4339	939	211	4067	2613	17,6	3604	4749	1009	1625	4188	2669
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ŠÚHE Košice
Odbor HÍP

9,224 households
sewerage 46%
septic tank 38%
latrine 16%

Štandardizovaná úmrtnosť (v promile) v exponovanej a porovnávacjej oblasti VS nížiny v roku 1991

OKRES	EXPO NOVANÁ OBLASŤ							
	MESTÁ				VIDIEK			
	MUŽI		ŽENY		MUŽI		ŽENY	
	abs.	rel.*	abs.	rel.*	abs.	rel.*	abs.	rel.*
HN	123	11.29	84	9.16	33	11.58	30	10.24
MI	174	11.98	148	10.38	240	10.65	229	9.34
TV	233	17.50	194	19.44	411	15.89	346	11.97
VV	77	9.73	60	7.88	94	9.83	89	10.55

OKRES	POROVNÁVACIA OBLASŤ							
	MESTÁ				VIDIEK			
	MUŽI		ŽENY		MUŽI		ŽENY	
	abs.	rel.*	abs.	rel.*	abs.	rel.*	abs.	rel.*
MI	28	14.01	16	8.50	229	13.05	169	9.31

Poznámka: Relatívne počty sú štandardizované na slovenskú populáciu.

Spracoval: ŠÚHE Košice, ODaVTI

Prehľad o počtoch živonarodených, mŕtvonarodených detí, dojčenskej, včasnej a novorodeneckej úmrtnosti, počte detí s nízkou pôrodnou hmotnosťou a výskyte VVCH v absolútnych číslach a prepočte na 1000 živonarodených v exponovaných a porovnávacej oblasti Východoslov. nížiny

Oblasť	Počet živonar. detí	Dojčenská úmrtnosť (do 1 r.)		Včasná úmrtnosť (do 7 dní)		Novorod. úmrtnosť (do 28 dní)		Počet mŕtvonar. detí		Počet s NPH (do 2500g)		Incidencia VVCH	
		ABS.	%.	ABS.	%.	ABS.	%.	ABS.	%.	ABS.	%.	ABS.	%.
Vranov	707	14	19.8	3	4.2	3	4.2	5	7.1	6	8.5	5	7.1
Humenné	687	10	14.6	1	1.45	9	13.1	0	0	42	61.1	36	52.4
Trebišov	1.423	31	21.8	10	7.0	17	11.9	9	6.3	112	78.7	22	15.5
Michalovce	1.243	12	9.7	7	5.6	7	5.6	6	4.8	106	85.3	49	39.4
S P O L U	4.060	67	16.5	21	5.2	36	8.9	20	4.9	266	65.5	112	27.6
Sobrance	399	6	13.7	4	9.2	4	9.2	1	2.3	38	87.0	8	18.3

Spracoval: ŠÚHE Košice, HDD

Incidenca vybraných infekčných ochorení v exponovanej
a porovnávacjej oblasti V5 nížiny v roku 1991

DIAG- NÓZA	EXPONOVANÁ OBLASŤ				POROVN.OBL.
	HUMENNÉ	MICHALOVCE	TREBIŠOV	VRANOV	MICHALOVCE
002					
003	436.9	161.8	181.7	146.4	106.0
004	206.2	125.4	131.2	202.9	95.8
005	7.4	16.3	12.9	-	17.1
008	98.2	109.1	25.8	5.1	88.9
009	2.5	-	135.5	-	-
070	41.7	97.8	62.4	79.6	30.8
033	-	-	-	-	-
055	-	-	181.7	-	-
056	355.9	104.1	8.6	92.5	41.1
072	2.5	5.0	29.0	5.1	3.4
011	27.0	40.1	11.8	30.8	61.6

Spracoval: ŠÚHE Košice, ODaVTI

Prehľad chorôb z povolania podľa závodov v exponovanej a porovnávacej oblasti
za roky 1987 - 1991 v regióne VS nížiny

O B L A S Ť	OTRAVY	KOŽNÉ OCHORE- NIA	INFEKČIE PRENOSNÉ Z ČLOVE- KA NA ČLOVEKA	ZOONÓZY	NEDOS- LÝCHA- VOSŤ	CHOROBY Z VIB- RÁCIÍ	SILIKÓ- ZA	OSTATNÉ CHP	IPZ	SPOLU
A. EXPONOVANÁ OBLASŤ										
SPOLU: mestá	1	32	80	4	13	5	-	26	1	162
vidiek	1	3	-	23	-	-	1	4	-	32
mestá + vidiek	2	35	80	27	13	5	1	30	1	194
B. POROVNÁVACIA OBLASŤ										
SPOLU: mestá	-	-	-	2	4	2	-	1	-	9
vidiek	-	1	-	26	-	-	-	3	-	30
mestá + vidiek	-	1	-	28	4	2	-	4	-	39

Počet chorôb z povolania (CHP) u obyvateľov exponovanej a porovnávacej oblasti
za roky 1987 - 1991 v regióne VS nížiny

PORAD. ČÍSLO	POČET CHORÔB Z POVOLANIA	EXPONOVANÁ OBLASŤ			POROVNÁVACIA OBLASŤ		
		MESTO	VIDIEK	SPOLU	MESTO	VIDIEK	SPOLU
1.	Absolútny počet CHP	82	65	147	2	44	46
2.	Prevalencia CHP na 100 000 oby- vateľov	109,97	139,97	121,48	70,45	424,51	348,38

Poznámka : Pri výpočte prevalencie CHP sa vychádzalo z počtu ekonomicky činného obyvateľstva získaného z cenzu v roku 1991.

Počet chorôb z povolania podľa diagnostických skupín u obyvateľov v exponovanej a porovnávacej oblasti
za roky 1987 - 1991 v regióne VS nížiny

DIAGNOSTICKÁ SKUPINA	POČET CHP V EXPONOVANEJ OBLASTI						POČET CHP V POROVNÁVACEJ OBLASTI					
	ABSOLÚTNY POČET			PREVALENCIA NA 100 000 OBYVATEĽOV			ABSOLÚTNY POČET			PREVALENCIA NA 100 000 OBYVATEĽOV		
	MESTO	VIDIEK	SPOLU	MESTO	VIDIEK	SPOLU	MESTO	VIDIEK	SPOLU	MESTO	VIDIEK	SPOLU
Otravy	-	2	2	-	4,31	1,65	-	-	-	-	-	-
Kožné ochorenia	17	16	33	22,80	34,45	27,27	-	-	-	-	-	-
Infekcie prenosné z človeka na človeka	43	13	56	56,67	27,99	46,28	1	7	8	35,22	67,53	60,59
Zoonózy	4	23	27	5,36	49,53	22,31	-	24	24	-	231,55	181,76
Nedoslýchavosť	6	2	8	8,05	4,31	6,61	1	2	3	35,22	19,30	22,72
Choroby z vibrácií	-	-	-	-	-	-	-	3	3	-	28,94	22,72
Silikóza	-	1	1	-	2,15	0,83	-	-	-	-	-	-
Ostatné CHP	10	3	18	13,41	17,23	14,88	-	8	8	-	77,18	60,59
IPZ	2	-	2	2,68	-	1,65	-	-	-	-	-	-
S P O L U	82	65	147	109,97	139,97	121,48	2	44	46	70,45	424,51	348,38

Poznámka : Pri výpočte prevalencie CHP sa vychádzalo z počtu ekonomicky činného obyvateľstva získaného z cenzu v roku 1991.

CHP - choroby z povolania

Spracoval : ŠÚHE Košice, PPL

Incidencia zhubných nádorov v exponovanej a porovnávacej
oblasti VS nížiny v roku 1991

OKRES	EXPO NOVANÁ OBLAS Ť							
	MESTÁ				VIDIEK			
	MU Ž I		Ž E N Y		MU Ž I		Ž E N Y	
	abs.	rel.	abs.	rel.	abs.	rel.	abs.	rel.
HN	36	205.37	31	165.17	6	272.48	6	267.98
MI	63	300.57	67	302.92	89	502.42	59	311.49
TV *								
VV	29	262.25	22	189.18	27	332.35	14	172.46

* údaje na úrovni ÚHE sa t.č. spracovávajú

OKRES	POROVNÁVACIA OBLAS Ť							
	MESTÁ				VIDIEK			
	MU Ž I		Ž E N Y		MU Ž I		Ž E N Y	
	abs.	rel.	abs.	rel.	abs.	rel.	abs.	rel.
MI	8	284.29	8	272.11	62	540.77	36	299.68

Poznámka: Relatívne počty sú vzťahované na 100 000 obyvateľov príslušnej skupiny.

Spracoval: ŠÚHE Košice, ODaVTI

Výskyt chronických bronchitíd, astmy a pollinóz v sledovanej oblasti VSN podľa okresov
k 31.12.1991 (absolútny údaj a relatívny na 100 000 obyv.)

OKRES	EXPOZOVANÁ OBLASŤ						POROVNÁVACIA OBLASŤ					
	Chron.bronch.		Astma		Pollinosis		Chron.bronch.		Astma		Pollinosis	
	abs.	rel.	abs.	rel.	abs.	rel.	abs.	rel.	abs.	rel.	abs.	rel.
HN	300	738.4	123	301.9	369	905.3						
MI	2155	2702.5	1127	1413.5	630	790.1	204	697.9	94	321.6	47	160.8
TV	132	141.9	100	107.5	145	155.9						
VV	381	927.4	221	567.7	5	12.8						
Spolu	2748	1166.1	1571	622.5	1149	455.3	204	697.9	94	321.6	47	160.8

Spracoval: ŠÚHE Košice, ODAVTI

Prehľad štúdií a prác zo sledovaní zdravotného stavu obyvateľstva v znečistenej oblasti Východoslovenskej nížiny

1. Špecializovaný ústav hygieny a epidemiológie

Michalus, M.:

Polychlórované bifenyly (PCB) stručná charakteristika výroby, kontaminácie životného prostredia a vplyvu na zdravie v oblasti n.p.

Chemko Strážske.

1988

Zpráva pre MZ SR a ČR a na celoštátnej porade krajských hygienikov.

Michalus, M. + kolektív:

Projekt A/RS/2 (Švajčiarsko-Československo)

Odstránenie znečistenia v regióne Strážske - podklady na návrhy

1991

Urbion Bratislava

Michalus, M. + kolektív

Zdravotno-hygienické zhodnotenie nadmerne znečistených oblastí Východoslovenského kraja (časť Strážske-Vranov)

1989

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