

## FEATURES OF THE INFLUENCE OF PESTICIDES DIFFERENT BY THE SPECIFICITY OF AGRICULTURAL PRODUCTION ON HEALTH INDICATORS OF CHILDREN

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**Abstract.** *We examined the data of appeals to outpatient clinics in order to detect the incidence of pneumonia in children in areas with different intensities of pesticide usage. It was found that in the areas of intensive usage of pesticides (cotton growing area) in children aged 0-4 years, acute pneumonia is recorded 3-5 times more often than in the zone of limited usage of pesticides (livestock area). The static differences are significant. The prevalence of acute pneumonia among girls is 7–20% higher than among boys. The highest level of respiratory diseases is found at the age of 1 to 4 years. With the increase in the territorial burden of pesticides, the level of perinatal pathology and the number of premature infants increase. The data confirm that acute pneumonia and other respiratory diseases are more common in the cotton growing area than in the livestock one. However, the study of the regional characteristics of the incidence of children has established that in the general structure of the respiratory diseases, pneumonia occupies the first place.*

**Keywords:** *pesticides, pneumonia, respiratory diseases, pulmonology.*

Until recently being considered a purely agricultural problem, the problem of pesticides has acquired a worldwide importance, having a profound effect on the health and the development of the biosphere as a whole [1,4,6].

In the modern conditions of rapid changes in the environment, the problem of environmental pulmonology, i.e. the study of the formation and the prevalence of environmentally related respiratory diseases [5,8,9,10,11,12]. In addition, in recent years, much attention has been paid to studying the role of nonspecific protective factors in the development of non-specific inflammatory lung diseases (NID), in particular pneumonia.

This problem causes increased attention due to the fact that, on the one hand, respiratory diseases have received a significant prevalence [5,8,9,10,11], and on the other hand, there is an increase in the incidence and the frequency of protracted forms of the disease [10, 11].

It was also found that the impact of the pesticides on the body (in acute or chronic poisoning) can be one of the main etiological factors in the development of pathology, which provokes and aggravates the course of many non-specific diseases, including respiratory diseases [8,10,11], the diseases of cardio vascular organs [2,7], digestive organs [9,12], nervous system [1,11] and gynecological pathology [1,3,7] in people living in the areas with the heavy use of chlorine and organophosphorus (X-OS and FOS ) pesticides.

In the Republic of Uzbekistan, in accordance with the generally recognized program - "Program for the development of scientific research and accelerating the implementation of medical science in the agricultural sector" S. K) Task 0.6.

A study of the effects of pesticides and plant growth regulators on public health (1985) in two districts (Buvaidinsky and Nuratinsky), the relationship between the intensity of pesticide usage and the morbidity of children were studied.

The program is based on the principles of an epidemiological survey with elements of a retrospective analysis of the main factorial relationships and dependencies. In order to identify the effect of pesticides on the overall morbidity of children, the method of directional selection of the objects of observation was used [11].

To solve these problems, the basis was the methodology of a comprehensive study of the overall morbidity rate developed at the Scientific Research Institute of Social Hygiene, Economics and Health Management named after Semashko (RAMS).

Selective contingents of the rural population were formed by the method of "nesting selection" (methodological statistical justification of the territories according to the recommendations of Leonov SA ("Selection of the territories for prospective research and studies of the state of public health in connection with the census "1989, M., 1987), that means that the most typical settlements for the given territory were selected.

The unit of observation was each person living within the radius of the rural medical site of the Buvaidinsky district of the Ferghana region, where 4995 people live: adults - 2745 (men - 1345, women - 1400), children under 14 years of age - 2250, boys - 1140, girls - 1110).

As the indicator of the main feature in the implementation of this method, the average annual territorial pesticidal load (kg/ha of arable land) with the degree of toxicity, cumulation, and resistance of the drugs used, was taken into account.

Therefore, for the drugs used in the region, the assortment index and the territorial pesticidal load indicators (Tables 1, 1), which were used to select the objects of observation and to identify the correlation dependences between the morbidity rates in children and the intensity of the use of agrochemicals in the regions of the Republic of Uzbekistan, were calculated.

Numerous domestic and foreign pesticides are widely used in Uzbekistan. According to the official data, only in the territory of the Republic of Uzbekistan over the past decade, about 6 thousand tons of chlorine-containing pesticides (CCP) are banned to use abroad [11].

As testified by J.111 Shodimetov [14], 80-85 thousand tons are annually used by the households of the republic. On average, 20–25 kg of pesticides falls on 1 hectare (2-3 kg/ha on average in the CIS countries).

*Table 1*

***Territorial pesticidal loads and the degree of soil pollution in two studied areas of the Republic of Uzbekistan (1986-1990)***

Administrative regions	Territorial pesticidal load, kg/had.v.* yearly (thousands)					Assortment index	Agricultural production	Pesticides	The degree of average annual soil pollution by pesticides and other fertilizers
	1986	1987	1988	1989	1990				
Buvaidinskiy region, Fergana region: experimental zone	87,6	92,4	102,3	113,2	97,4	21,378	Cotton growing	472,5	28,1
Nuratinskiy region, Samarkand region: control zone	67,3	68,4	70,2	71,8	74,4	16,874	Livestock and grains growing	352,1	9,7

Footnote: \* - kg/had.v. - pesticide consumption by the amount of active substance.

*Table 2*

***Turnover incidence in Buvaidinskiy district of Ferghana region and Nuratinskiy district of Samarkand region***

Classes of diseases and some nosological forms	Buvaydinskiy district			Nuratinskiy district		
	Total population	Boys	Girls	Total population	Boys	Girls
Infectious and parasitic diseases	111,4	60,8	159,2	152,5	172,2	131,9
Including enteritis	68,8	27,0	108,2	85,6	93,9	76,9
Diseases of the endocrine system, eating disorders.	85,2	20,2	146,4	83,8	97,4	69,6

Including - rickets	45,9	13,5	76,4	8,9	12,2	5,5
malnutrition	39,3	6,7	70,0	18,7	17,4	20,1
Diseases of the blood and blood-forming	39,3	33,7	44,7	25,0	33,0	16,5
Diseases of nerve system and sensory	108,1	135,1	82,8	35,7	40,0	31,1
includingconjunctivitis	32,7	47,2	19,1	13,4	13,9	12,9
- otitismedia	72,1	87,8	63,6	21,4	26,1	16,5
Respiratorydiseases	819,6	770,2	866,2	464,8	492,2	435,9
Including acute respiratory viral	554,0	513,5	592,3	306,8	328,7	283,9
- bronchitis	186,8	182,4	191,0	107,1	106,1	108,1
- pneumonia	68,8	60,8	76,4	14,3	22,6	5,5
Digestive system diseases	65,6	60,7	70,0	16,1	17,4	14,7
Diseases of the skin and subcutaneous	49,1	67,5	31,8	49,1	50,4	47,6
Others	13,6	7,2	19,2	45,5	50,4	40,2
Total	1291,8	1 155,4	1420,3	872,5	953,0	787,5

**Table 3**

***Average annual consumption rates of mineral fertilizers in the examined cotton and livestock areas of the Republic of Uzbekistan***

Administrativeregions	Territorial load, kg/ha (d.v		Totalvolumein 5 years
	Nitrogen	Phosphoric	
Buvaydinskiy district, Fergana region: experimental zone	34768	21340	67436
Nuratinskiy district, Samarkand region: control zone	6220	147	6367

The generally accepted “List of chemical and biological means of controlling pests, plant diseases and weeds, and plant growth regulators” the drugsto be used in the Republic of Uzbekistan are often included without taking into account its such geological and climatic specific features as

“irrigation, water supply to the population, mainly from surface water sources, high ambient temperature, lack of high-quality equipment, etc.).

The widespread usage of pesticides has led to an emergency sanitary and environmental situation in the republic. They are found in all open waters. In certain regions of Uzbekistan, up to 20% of food products of animal and vegetable origin are contaminated by them. Annually 20-50 acute and 30-60 chronic pesticide poisonings are registered in the republic. In 1990, 673 patients with chronic pesticide intoxication were registered (from Decree No. 6 of the Chief State Sanitary Doctor of the UzSSR Iskandarov T.I. “On the Prohibition and Limitation of the Use of Highly Toxic and Highly Hazardous Pesticides in Agriculture of the UzSSR” from May 21, 1990, Tashkent).

An analysis of the materials by the intensity of usage of individual groups of pesticides (by chemical composition) shows that the most persistent in the environment is CWS that makes up to 19.1% of the total amount of substances used, FOS - 26.3%, mercury-containing - 4.8%, while others account for a predominant amount of 49.8%.

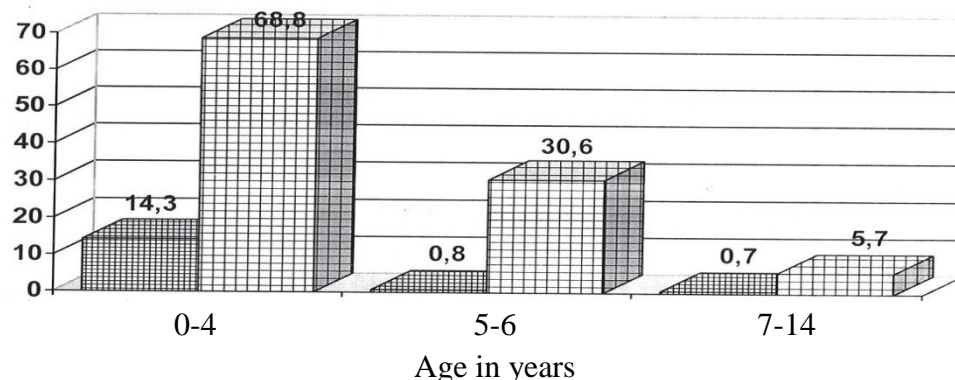
A retrospective analysis of the intensity of the usage of individual drugs required to determine the priority substances which were the object of the bulk of the analytical work, and which allows us to determine the content of pesticides in environmental objects, showed that the dominant position is occupied by the 2.4 - D amine salt (7, 16 kg / ha), chlorophos •L (4.7 kg / ha), copper sulfate (4.7 kg / ha), cineb (2.26 kg / ha), ambush (31.1 kg / ha), magnesium chlorate (16.1 kg / ha), colloidal sulfur (2.05 kg / ha), HCCH (4.79 kg / ha). The load of the remaining substances, that make up an absolutely predominant amount (164 and 68 kg / ha), ranges from 0.01-2.0 kg / ha.

We have studied the characteristics of the morbidity of children of the two regions of Uzbekistan, that are different in the usage of territorial loads by pesticides. The data on the appeal of the population to outpatient clinics were processed in order to identify the incidence of pneumonia in children in areas with different intensities of pesticide usage. The comparison was carried out with close age-sex composition, ethnicity, taking into account the natural and climatic conditions of the studied areas.

The morbidity rate of children under 4 years of age according to appeal data is almost 1.5 times higher in the Buvaidinsky district, compared with the control - Nuratinsky (Table 2).

An excess of the incidence rate was observed in the following classes and nosological forms: rickets, hypotrophy, diseases of the blood and blood-forming organs, diseases of the nervous system and sensory organs, including conjunctivitis and otitis media, respiratory diseases, including 3-5 times more pneumonia, acute respiratory viral infections, bronchitis, digestive diseases. At the same time, in the livestock district, infectious and parasitic diseases, including intestinal infections, were reported more often than in the cotton growing region. 2). Differences in incidence rates are statistically significant ( $P < 0.05$ ), with the exception of “endocrine system diseases, digestive disorders, metabolic disorders and the disorders of immune system”.

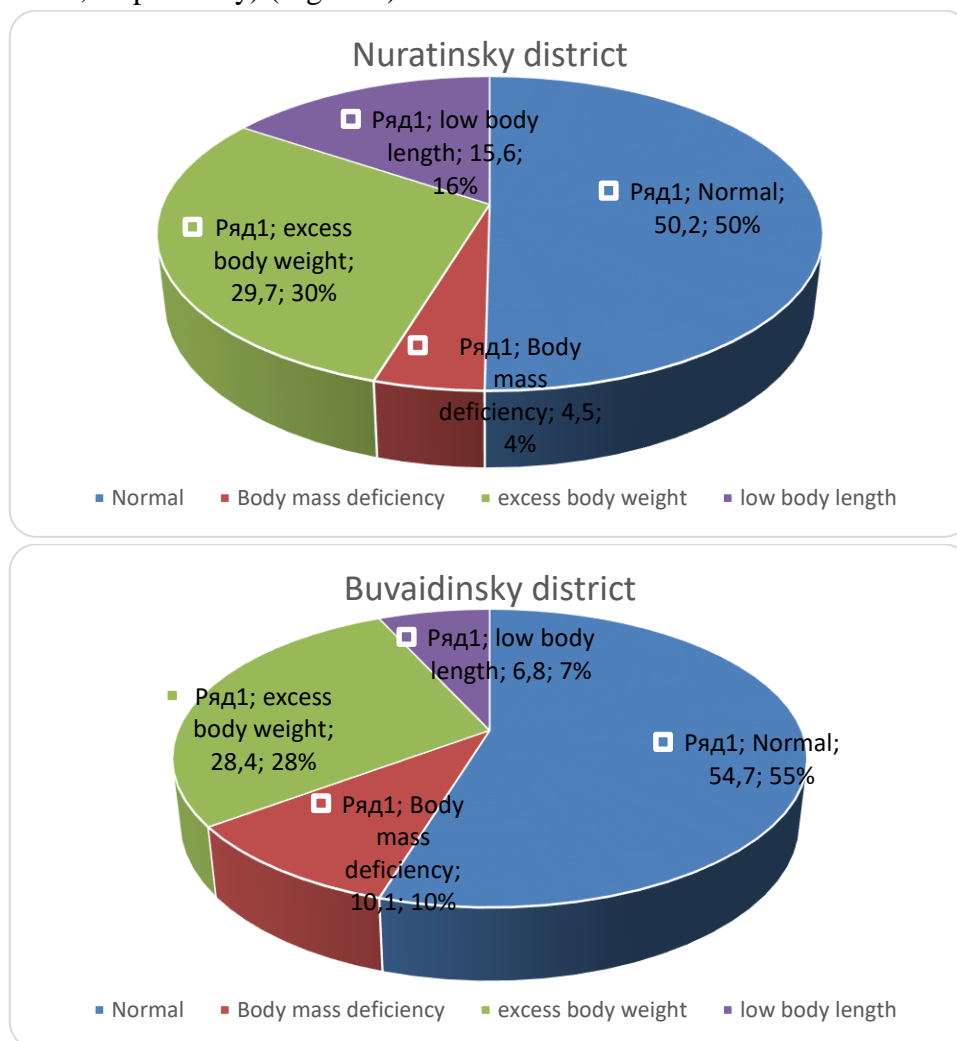
In the structure of the general morbidity of children in both cotton growing and livestock breeding areas, respiratory diseases, which are formed due to acute respiratory diseases, acute bronchitis, bronchopneumonia, are in the first place. The structure of the general morbidity in both regions is quite comparable, with the exception of a larger share of respiratory diseases, in particular acute pneumonia in the cotton growing region (Figura 1).



**Figure 1. The incidence of pneumonia per 1000 rural children of the corresponding age**

The real factor shaping children's health is nutrition features in the areas differing in the specifics of economic activity and, it can be assumed, that there is a greater consumption of animal proteins in the livestock area, and their insufficient number in the cotton growing area.

In the livestock breeding area, a significantly larger number of children with normal physical development was identified -50.2%, while in the cotton growing area there was only 28.4% of such children. At the same time, in the second group, a significantly larger proportion were children with disabilities in physical development, in particular, with a reduced body length (54.7 and 29.7%, respectively) (Figure 2).



**Figure 2. The level of physical development of children aged 4 years in the compared areas (%).**



In the context of a further increase in the volume and intensity of pesticides in agriculture, it is becoming increasingly important to uncover patterns and predict the real danger of environmental impacts on the health status of the children's population, including modern socio-economic problems.

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