

Demographic and health situation of children in conditions of economic destabilization in the Ukraine

Viktoriya Pantyley

Faculty of Earth Sciences and Spatial Management, Maria Curie Skłodowska University, Lublin, Poland

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Abstract

Introduction and objective. In new conditions of socio-economic development in the Ukraine, the health of the population of children is considered as the most reliable indicator of socio-economic development of the country. The primary goal of the study was analysis of the effect of contemporary socio-economic transformations, their scope, and strength of effect on the demographic and social situation of children in various regions of the Ukraine. The methodological objectives of the study were as follows: development of a synthetic measure of the state of health of the population of children, based on the Hellwig's method, and selection of districts in the Ukraine according to the present health-demographic situation of children.

Material and methods. The study was based on statistical data from the State Statistics Service of Ukraine, Centre of Medical Statistics in Kiev, Ukrainian Ministry of Defence, as well as Ministry of Education and Science, Youth and Sports of Ukraine. The following research methods were used: analysis of literature and Internet sources, selection and analysis of statistical materials, cartographic and statistical methods.

Results and conclusions. Basic indices of the demographic and health situation of the population of children were analyzed, as well as factors of a socio-economic nature which affect this situation. A set of variables was developed for the synthetic evaluation of the state of health of the population of children. The typology of the Ukrainian districts was performed according to the state of health of the child population, based on the Hellwig's taxonomic method. Deterioration was observed of selected quality parameters, as well as a change in the strength and directions of effect of factors of organizational-institutional, socioeconomic, historical and cultural nature on the population of children potential.

Key words

State of health of population of children, Ukraine, economic destabilization, taxonomic analysis

INTRODUCTION

Socio-economic transformations which have been observed in the Ukraine since the beginning of the 90s of the 20th century contributed to many important changes, which manifest themselves especially in the economy and in the sphere of social relations [1, 2]. The directions, scale and some kind of inconsistency in reforming various spheres of social life resulted in a considerable deterioration of the quality of life and material standard of the Ukrainian population, which is clearly observed especially in the area of public health. Economic transitions, which are of key importance for the achievement of economic balance, have not, unfortunately, brought about measurable benefits in the form of improvement of the wellbeing of the population and obtaining a higher quality of life, including one of its elements – the state of social health. At the same time, relatively large spatial differences reveal themselves between the capital region, considerably economically benefiting from these changes and, especially, peripheral agricultural areas. During the period of contemporary economic destabilization, the population of children was most susceptible to the transformations concerning the socio-economic environment, and the health

of this population is considered as the most reliable indicator of the socio-economic situation of the country, its macro- and micro-regions.

OBJECTIVE

The primary goal of the study was analysis of the effect of contemporary socio-economic transitions, their scope, and strength of effect on the demographic and social situation of children in various regions of the Ukraine. The methodological objectives of the study were as follows: development of a synthetic measure of the state of health of the population of children, based on the Hellwig's taxonomic method, selection of districts in the Ukraine according to the present health-demographic situation of children

MATERIAL AND METHODS

The study was based on published and non-published statistical data from the State Service of Statistics (formerly the State Statistics Committee of Ukraine), Centre for Medical Statistics in Kiev, Ukrainian Ministry of Defence, as well as Ministry for Education and Science, Youth and Sports of Ukraine (former the Ukrainian Ministry for Family Affairs, Youth and Sports). Analysis of basic demographic and health characteristics of the children population was performed

Address for correspondence: Viktoriya Pantyley, Faculty of Earth Sciences and Spatial Management, Maria Curie Skłodowska University, Kraśnicka 2 cd, 20-718 Lublin, Poland
e-mail: pantyley@yahoo.com

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on the level of oblasts (NUTS-2). The following research methods were used: analysis of literature and Internet sources, selection and analysis of statistical materials, cartographic and statistical methods (calculation of intensity indicators, Hellwig's taxonomic measures).

Aggregate indicators of the state of health of the population of children, both partial and synthetic, were calculated according to the pattern proposed by Z. Hellwig [3]. While calculating Hellwig's taxonomic measure, at the first stage the standardization of variables was performed reflecting the state of health of the population of children, whereas at the second stage – necessary calculations were performed of taxonomic measures of the state of health of children. The value of taxonomic measure d_i generally changes from 0 (an object considerably differs from the standard, a very unfavourable situation), to 1 – a standard object, a very favourable situation.

The values of taxonomic evaluations of the state of health of the population of children were divided into 5 categories. Each category was ascribed evaluative attributes (for example, very good state of health), which show the situation of an individual, both with respect to the synthetic and partial indicators (Tab. 1).

Table 1. Classification of districts in Ukraine from the aspect of the state of health of the population of children, based on taxonomic analysis

Categories	Values of taxonomic measures taksonomicznych miar	State of health of children's population
I	below 0.200	very bad
II	<0.200–0.400)	poor (below mediocre)
III	<0.400–0.600)	mediocre
IV	<0.600–0.800)	good (over mediocre)
V	<0.800–1.000)	very good

Source: own study.

RESULTS AND DISCUSSION

Contemporary economic destabilization in the Ukraine and its effect on health and demographic situation of the population of children

Among the most important determinants of the health and socio-demographic situation of a nation is the value of Gross National Income *per capita*. Currently, in individual countries, the GDP index according to the purchasing power parity remains on the level from 670 – 81,000 USD. The WHO, as a threshold of poverty, adopts income of 5,120 USD. In this context, it may be presumed that the Ukraine, from the time of gaining independence, is in a very uncomfortable situation. In 1990, its GDP *per capita* was close to 5,000 USD. However, in the subsequent years, it began to decrease, down to the level of below 2,200 USD in 1997, with the strongest downward tendency observed during the period 1992–1994. As late as after 1997 the situation started to gradually improve. The effects of these changes in the shaping of the living conditions of the Ukrainian inhabitants result both from very big decreases in GDP, and the long period of their occurrence. In practice, the decrease in GDP noted during the period 1990–1997 meant a clear decrease in personal income of the inhabitants by nearly 60%, and considerable

limitations in the possibilities of the State in the area of financing public expenses and, therefore, primarily for the health of the population in various age groups, education, safety, and others. In 2009, the index discussed reached the value of 6,318 USD *per capita*. For comparison, in Poland in 2009, the GDP was approximately 18,905 USD, which was a four times higher value from that adopted by the WHO as a poverty threshold which, however, is clearly lower than in other countries of the European Union (Fig.1).

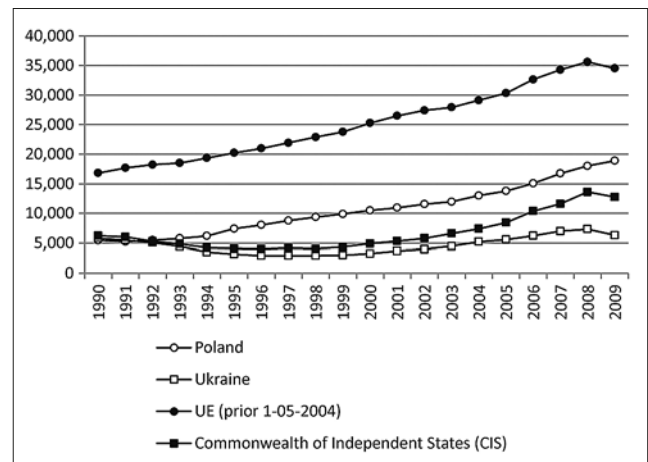


Figure 1. Dynamics of GDP per capita in USD according to purchasing power parity in selected territorial units during 1990–2009. Sources: own study on a basis [4]

In order to evaluate the spatial variations in the standard of living of the Ukrainian population, the spatial differences in the GDP values are important. From this aspect, the capital region was in the best situation, whereas a considerably worse situation was observed in the trans-border region with Poland. The difference in the GDP values *per capita* between the capital of the Ukraine – and the poorest region of the country – the Transcarpathian region – is even about 9.2 – fold.

Another important indicator of the socio-demographic situation of a nation is the scale of poverty, which was evaluated by means of a Minimum Monthly Social Security Payment. In the fourth quarter of 2011 in the Ukraine this was 953 UAN (i.e. about 3.8 USD daily). In the light of this criterion, as many as 40% of Ukrainian citizens have an income below the Minimum Monthly Social Security Payment. Households with children are in an especially unfavourable situation: the percentage of poor households with two and more children reaches even 44%, while among those with no children this percentage is 34% [5].

Among other criteria for evaluation of the material standard of the population, is the level of monthly expenditures *per capita* in a household, with consideration of their structure, especially expenditures for food. According to the UN, into poor countries are classified those where more than 50% of the population income is designated for food. In 2009 in the Ukraine, this indicator was nearly 53.4% [6]. At the beginning of the period of transformations it was much lower – less than 33%, with a later drastic increase up to the level of 65% in 2000. At present, nearly 65% of all expenditures of an average Ukrainian family are expenses for food, payment for lodging and its current maintenance. Thus, it is difficult to expect an investment in children from the majority of Ukrainian families, their education, recreation and culture.

An important criterion is also self-reported income obtained by the Ukrainian population. From the spatial aspect, the largest percentage of households, the members of which consider themselves as poor according to the criterion of material standard, are focused in the central (except for the city of Kiev) and south-eastern part of the country (Fig. 2).

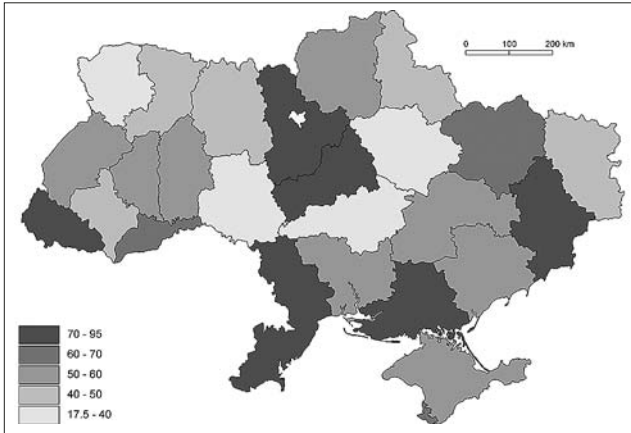


Figure 2. Percentage of households, the members of which consider themselves as poor according to the criterion of material standard, in the total number of households in 2009

Source: own study based on [7].

An efficiently-functioning system of health care is an important precondition for maintaining a good state of health of the population of children, and one of the reliable measures of the effectiveness of the functioning of health care is the contribution of expenditures for health care borne by the State at the total GDP value. At present, this indicator is estimated in the Ukraine to be on the level of 3–3.5%, which is the value close to the Commonwealth of Independent States, but considerably different from that in the countries of the EU. According to the WHO, if the percentage of expenditures for health is below 6.5% GDP, this is evidence that the system is incapable of functioning. Another indicator of the functioning of the health care system is also the indicator of the general expenditures for health expressed, e.g. in USD acc. to PPP *per capita*. At present, this indicator remains on the level of approximately 500 USD, which is the value more than twice as low than that in Poland, and nearly seven times lower than the average value for the countries of the old European Union (Fig. 3).

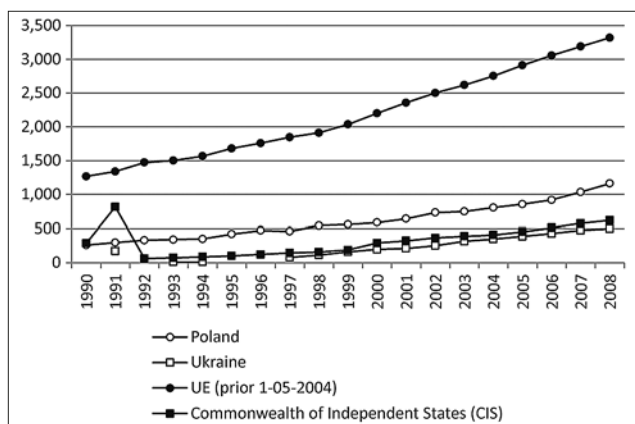


Figure 3. General expenditures for health care, USD acc. to PPP per capita during 1990–2008 in selected territorial units.

Source: own study based on [4]

At present, the State of Ukraine spends less on health care than Belarus or Russia, and is comparable to Kazakhstan and Georgia. This situation leads to a hidden increase in non-public medicine. The expenditures for health paid from their own pockets by the citizens are: official payments for selected medical services, voluntary payments and financial support from medical organizations, which is a disguised form of payment for medical services, independent purchasing of one's own of drugs with ambulatory treatment, and semi-official payments for hospitalization, medical examinations and laboratory tests, and unofficial bribes or thanks for those who provide medical services. For many Ukrainian citizens, the financing of treatment exceeds their possibilities. In 45% of the poorest citizens, the monthly expenditures for health care reached a half of their monthly budget, and in 7% – exceeded 50% [8].

The basic barriers in the availability of medical care in the Ukraine are the excessively high prices of drugs, medical articles and services [7]. Among all the households examined from this aspect by the State Committee of Statistics (in 2009), there clearly dominated those in which at least one member needed medical assistance, but who could not receive it.

An important factor shaping current health situation of the children population are the consequences of the Chernobyl nuclear power plant disaster in 1986. Nearly 25% of lands of the Ukraine were strongly contaminated with Cesium-137 (12 Oblasts, 78 regions, and more than 2000 urban centres), especially in the territory of Kiev, Zhytomyr and Tchernichovsky oblasts, and to a smaller degree the oblasts of Vinnicka, Cherkaska, Rivenska, Ternopil'ska and Ivano-Frankivsk oblasts [2]. At present, the contaminated areas are inhabited by nearly 3 million people.

Demographic and health situation of population of children in the Ukraine

While analyzing the demographic situation of the population of children, one should refer primarily to the dynamics of the numbers of this population. During 1989–2010, the number of the population aged 0–17 decreased by 40% with respect to the spatial variation in the numbers of children; at present, the region of the Ukraine which is demographically the youngest is its western part bordering Poland. The lowest percentage of the population aged 0–17 is noted in the eastern part, which is highly urbanized and ecologically degraded, and the capital of the Ukraine – the city of Kiev (Fig. 4).

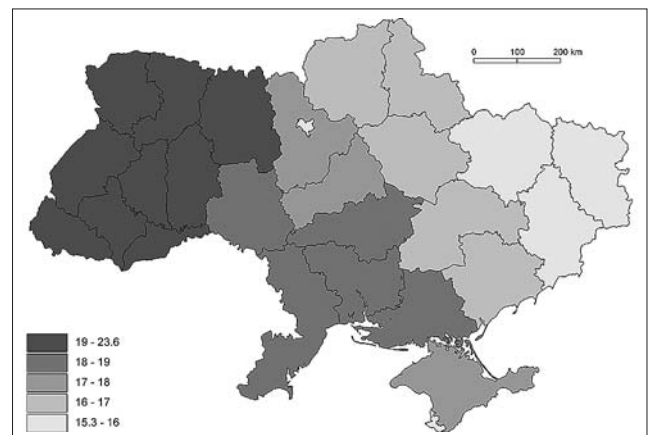


Figure 4. Percentage of children aged 0–17 in the total number of Ukrainian population in 2009.

Source: own study based on [9]

Historical factors, especially demographic loss caused by the Second World War and the Great Famine of 1932–33 in Ukraine, exerted a tremendous effect on the spatial variation in the number of the children population. As a result of the Great Famine, the demographic population loss in the Ukraine was about 9.1 million inhabitants [10]. The central and southern parts of the Ukraine suffered most due to this event – the Oblasts of Kiev, Charkov, Poltava, Cherkasy, Kirovohrad, Dnipropetrovsk, Donetsk, Luhansk, as well as some southern oblasts (Chersonsk, Mykolaiv, Zaporizhia). At that time, high death rates which were accompanied by very low birth rates contributed to the deformation concerning age and gender of the population, clearly observed especially in the above-mentioned areas. Currently, lower numbers of the population aged 65–69 and 70–74 are noted. Another characteristic of the Ukrainian population age pyramid is a high disproportion in gender, especially clearly observed in groups aged over 34, to the disadvantage of males caused by an excessive mortality of males at productivity age [2].

A systematic, and at the same time, deep decrease in birth rate which has lasted since the 1970s is a decisive factor in the very slow pace of the demographic development of the country. The total birth rate among the Ukrainian population decreased from 12.6‰ in 1990 to 11.1‰ in 2009. Today, these rates are the lowest in the total post-war history of the Ukraine. This is associated with many varied factors, such as the drastic deterioration of the standard of life of the rural population, high number of divorces, poor state of health of women at reproductive age, psychosocial tensions, increase in secondary infertility of women due to abortion, etc. The Institute of Sociology in Kiev [11] reports that 68 per 1,000 women at reproductive age suffer from infertility, which causes loss in the number of births, reaching up to 10% of the total number of births. It seems that socio-economic transformations in the Ukraine contribute to deep destructive changes in the demographic situation as a result of the creation of a new system of social values, and the assimilation of European patterns of the family model, also in the rural areas.

In 2009, parity among Ukrainian women was 1.460, while the mean age of women at first childbirth – 24.8. This is a relatively young age, compared to other European countries, e.g. Germany (29) or Denmark (30); however, with an upward tendency. Socio-economic changes deepened the process of transformation of a traditional rural family from the model 2+3, 2+2 to the model 2+1, or even 2+0, and also contributed to the number of incomplete families, single mothers raising children alone, extra-marital births (from 12.4% of the total number of births in 1989 to 21.2% in 2009) (Fig. 5).

For a long time, a high number of abortions performed officially in public health care facilities has been a complex problem. This phenomenon became most intense in 1990, and subsequently, a relatively clear decrease was observed (Tab. 2). Despite a considerable decrease in the number of abortions, compared to 2009, this problem still remains a serious threat to the shaping of the population potential in the Ukraine.

An increase observed in the number of unwanted pregnancies among young girls aged 15–17 is an especially complex problem. From the spatial aspect, the largest number of abortions per 100 live births are noted in the central part of the Ukraine, as well as in the southern and eastern districts – industrialized, highly urbanized areas with a low level of

Table 2. Dynamics of the number of abortions performed in the Ukraine during the period 1985–2009

Specification	1985	1990	1995	2000	2004	2006	2009
Number of abortions in thousands	1,179	1,019	740	434	346	230	195
Number of abortions per 1,000 women aged 15–49	88.6	82.6	58.2	34.1	17.6	18.7	16.4
Number of abortions per 100 live births and stillbirths	154.0	155.0	150.0	113.0	89.0	51.0	38.0

Source: own study based on [6]

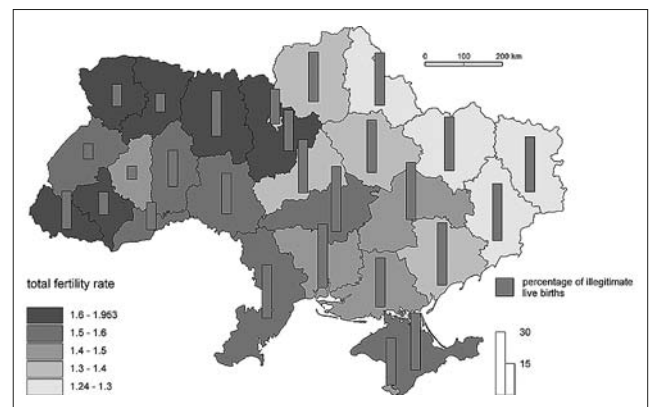


Figure 5. Parity among women and percentage of extra-marital births, compared to the total number of births in the Ukraine, 2009.

Source: own study based on [9]



Figure 6. Abortions in the Ukraine according to place of residence and women's age in 2009.

Source: own study based on [12]

health culture, and smaller effect of religious institutions on the life of the population (Fig. 6).

For a long time, infant mortality has been considered as the most clear indicator of the socio-economic and health situation of nations and regions. It depends on many varied environmental, medical, economic, and other factors. These factors exert a direct effect on the phenomenon of infant mortality within a longer period of time (reproductive health of women, mode of life, contamination of the environment, genetic conditioning, general socio-economic situation of nations). During the analyzed period, the infant death rate reached the highest value in 1996, i.e. in the year of the greatest economic breakdown. Later, the situation clearly improved. In the initial period of intensive socio-economic changes (in 1990), infant mortality was clearly higher in the western part of the Ukraine (but not in the south-eastern part of the country, as in 2010) (Fig. 7).



Figure 7. Infant deaths per 1,000 live births according to place of residence.

Source: own study based on [13]

The most frequent causes of infant deaths are pathological states developing during the perinatal period, i.e. during pregnancy and the first 6 days of life of a newborn. These are primarily disorders associated with the shortening of the duration of pregnancy and low birth weight, followed by respiratory and cardiovascular disorders, also typical of the perinatal period. These two groups of disorders are responsible for approximately 65% of infant deaths. A further 25% are congenital developmental defects, such as: cardiovascular system defects, anencephaly, spina bifida and defects concerning the nervous system. An increase in the percentage of infant deaths due to external causes observed during the period analyzed is especially alarming (Tab. 3).

Table 3. Dynamics of infant mortality in the Ukraine during the period 1990–2010

Specification	Rates per 1,000 live births		Percentage	
	1990	2010	1990	2010
Total	128.4	91.3	100.0	100.0
Some states originating in the perinatal period	48.8	48.1	38.1	52.7
Congenital developmental defects	37.4	21.7	29.0	23.8
Respiratory system diseases	14.8	2.8	11.5	3.1
External causes	6.3	5.3	4.9	5.8
Contagious and parasitic diseases	7.3	2.6	5.7	2.8

Source: own study based on [13].

The high mortality of mothers is an important problem related with infant deaths. In 2009, it was nearly three times higher than in Poland and in the EU countries; nevertheless, by a half lower compared to the Commonwealth of Independent States [4]. Among the causes of deaths of mothers dominate: pregnancy and labour complications, mortality due to abortion performed outside hospital, and pregnancy toxicosis.

Analysis of the dynamics of basic morbidity rates in the population of children aged 0–14 confirms a tremendous health crisis in this age group. During the analyzed period, a rapid increase was noted in morbidity among children due to civilisation diseases – cancer, diseases of the nervous, respiratory, and cardiovascular systems, diseases of the skin and subcutaneous tissue, as well as congenital developmental defects and traumas, injuries and poisonings, while a

Table 4. Dynamics of morbidity among the population of children in the Ukraine according to selected causes per 100,000 children aged 0–14 during the period 2000–2009

Years	2000	2005	2006	2007	2008	2009
All nosologic units	122,775	137,817	137,384	143,051	142,200	146,415
Contagious and parasitic diseases	6,231	6,256	6,036	6,137	6,277	5,861
Cancer	218	269	281	281	279	284
Diseases of blood and haematopoietic organs	1,912	2,080	2,089	2,080	2,011	1,899
Endocrine, state of nutrition and metabolic disorders	2,707	2,355	2,301	2,192	2,103	2,116
Mental illnesses and behaviour disorders	640	627	627	597	605	585
Nervous system diseases	1,477	1,896	1,962	1,948	1,970	1,970
Cardiovascular system diseases	769	796	802	784	822	872
Respiratory system diseases	77,149	89,746	89,646	94,847	94,266	98,953
Alimentary system diseases	5,096	5,444	5,377	5,419	5,355	5,438
Diseases of the skin and subcutaneous tissue	6,916	7,476	7,376	7,609	7,472	7,349
Diseases of osteoarticular system, muscles and connective tissue	2,505	2,619	2,590	2,450	2,475	2,521
Diseases of urogenital system	2,042	2,412	2,398	2,405	2,400	2,398
States originating in perinatal period	33,188	23,094	22,072	19,900	18,182	16,161
Congenital developmental defects	584	623	644	630	650	681
Consequences of external factors	4,614	4,759	4,841	4,972	5,014	5,026

Source: own study based on [9].

decrease by 6% was noted due to contagious and parasitic diseases (Tab. 4).

In order to provide a general evaluation of the state of health of the population of children, a number of variables were selected which were divided into the following subject categories (Tab. 5).

All the variables were subjected to the process of standardization, and the synthetic indicator of the state of health of the population of children was calculated based on Hellwig's taxonomic measure. In the light of adopted measures, described in the sub-section *Materials and methods*, none of the administrative units in the Ukraine analyzed entered categories IV or V, characterized by a good or very good state of health of children, and only 8 units of Ukrainian districts are characterized by a mediocre state of health of the population of children. These are the western districts – bordering Poland – with a very good ecologic situation, as well as two north-eastern districts (Poltava Oblast and Sumskaya Oblast), and two southern districts (Mykolaiv Oblast and Zaporizhia Oblast). The capital of the Ukraine – Kiev – is placed in category I, characterized by the

Table 5. Variables selected for taxonomic analysis of the state of health of the population of children in the Ukraine in 2009.

Synthetic indicators	Partial indicators	Variables
State of health of the population of children aged 0–17	Mortality among children	Infant mortality rate per 1,000 live births; Stillbirths per 1,000 live births; Mortality due to contagious and parasitic diseases per 1,000 live births; Mortality due to nervous system diseases per 1,000 live births; Mortality due to respiratory system diseases per 1,000 live births; Mortality due to states originating in the perinatal period per 1,000 live births; Mortality due to congenital developmental defects per 1,000 live births; Mortality due to external causes per 1,000 live births
	Incidence of diseases among children	Incidence of all nosologic units per 1,000 children; Incidence of active tuberculosis per 1,000 children; Incidence of malignant cancer per 1,000 children; Incidence of sexually transmitted diseases per 1,000 children aged 15–17; Incidence of AIDS per 10,000 children; Incidence of nervous system diseases per 1,000 children; Incidence of mental illnesses and behaviour disorders per 1,000 children; Incidence of endocrine, state of nutrition and metabolic disorders per 1,000 children; Incidence of respiratory system diseases per 1,000 children; 10. Incidence of congenital developmental defects per 1,000 children; 11. Incidence of traumas, poisonings and other consequences of external factors per 1,000 children; 12. Disability among children per 10,000 children.
	Prevalence of diseases among children	Prevalence of all nosologic units per 1,000 children; Prevalence of active tuberculosis per 1,000 children; Prevalence of malignant cancer per 1,000 children; Prevalence of sexually transmitted diseases per 1,000 children aged 15–17; Prevalence of AIDS per 10,000 children; Prevalence of nervous system diseases per 1,000 children; Prevalence of mental illnesses and behaviour disorders per 1,000 children; Prevalence of endocrinal, state of nutrition and metabolic disorders per 1,000 children; Prevalence of respiratory system diseases per 1,000 children; Prevalence of congenital developmental defects per 1,000 children; Prevalence of traumas, poisonings and other consequences of external factors per 1,000 children.

Source: own study

poorest state of health of children, with the highest incidence of respiratory system diseases, the highest level of traumas, injuries, poisonings, and congenital developmental defects, compared to other administrative units in the Ukraine. Considering the position occupied by Kiev with respect to the state of health of the population of children, this may be explained by a higher detection rate of diseases in children due to well-equipped and specialized health care facilities for children (Fig. 8).

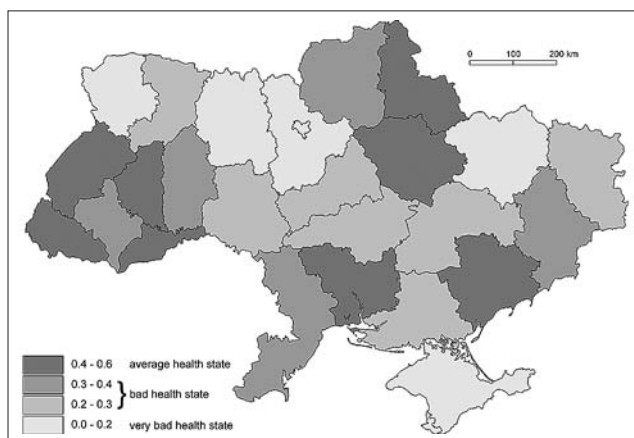


Figure 8. Synthetic indicator of the state of health of the population of children in the Ukraine, 2009.

Source: own study

disaster, is in an equally unfavourable situation, as well as some eastern and southern Oblasts, also Crimea with Sevastopol – due to the highest incidence of malignant cancer in children, sexually-transmitted diseases and AIDS, mental illnesses and behaviour disorders, as well as a high incidence of active tuberculosis and a high rate of stillbirths.

CONCLUSIONS

Analysis of the basic demographic and health characteristics of the population of children allows the presumption that there is a serious health crisis among children in the Ukraine. Considerable spatial disproportions in the state of health were observed in children from various regions of the country. The most unfavourable situation is noted in the central administrative units – most affected by the Chernobyl nuclear disaster, as well as southern areas – highly urbanized and ecologically degraded. It was found that in the Ukraine, the new conditions of socio-economic development, manifested with the breakdown in the material standard of the population, increase in unemployment, especially that which is disguised and among adolescents, decrease in social safety, growing psycho-social tension caused by the lack of faith and hope for the future – result in a considerable deterioration of the quality of health potential of the population of children.

The population of children in the central part of the Ukraine, which suffered most from the Chernobyl nuclear



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