

Ministry of Education and Science of Ukraine
V. N. Karazin Kharkiv National University

METHODS OF STUDY AND EVALUATION OF NATURAL MOVEMENT INDICATORS

Methodical recommendations
to prepare 3rd–4th year students for practical classes
Discipline "Social Medicine, organization of health care"

Electronic resource

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*Approved for distribution in the Internet by the decision of the Scientific and Methodical Council
of V. N. Karazin Kharkiv National University
(Protocol № 8 of May 16, 2023)*

M 61 **Methods** of study and evaluation of natural movement indicators : methodical recommendations to prepare 3rd–4th year students for practical classes Discipline "Social Medicine, organization of health care" [Electronic resource] / compilers Oksana V. Bobrova, Nataliia H. Tsukor. – Kharkiv : V. N. Karazin KhNU, 2023. – (PDF 29 p.)

The methodical recommendations set out the main aspects of the natural movement of the population. For 3rd–4th year students to prepare for practical classes in the discipline "Social Medicine, organization of health care".

UDK 614.1(072)

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1. INTRODUCTION

Demographics in Ukraine and one of the world's most pressing topics latest international and Ukrainian medical discussions underway at all levels. One of the most important demographic indicators are indicators vital that most fully and comprehensively reflect the demographic of society. Economic and social turmoil that our country has experienced in 90 years is reflected in major demographic and affect the performance of natural movement. Unstable socio-economic situation in our time also leads to changes in demographics.

The US Census Bureau's world population clock estimated that the global population as of September 2022 was 7,922,312,800 people and was expected to reach 8 billion by mid-November of 2022. This total far exceeds the 2015 world population of 7.2 billion. The world's population continues to increase by roughly 140 people per minute, with births outweighing deaths in most countries.

Overall, however, the rate of population growth has been slowing for several decades. This slowdown is expected to continue until the rate of population growth reaches zero (an equal number of births and deaths) around 2080-2100, at a population of approximately 10.4 billion people. After this time, the population growth rate is expected to turn negative, resulting in global population decline.

Although population projections such as the US Census Bureau's World Population Clock utilize the most accurate and up-to-date data available, they are nonetheless still estimates. Unforeseen events such as the COVID-19 pandemic or Russia's 2022 invasion of Ukraine can have a powerful, but impossible-to-anticipate impact on population trends.

Even in the absence of such disruptions, the process of tracking the exact number of births and deaths in every country and territory in the world in real time—and maintaining a precise tally of the number of people alive on the Earth at any given moment—is logistically infeasible. Instead, modern population scientists use sophisticated mathematical models to create detailed estimates and projections, which the world's countries can use to plan for future generations.

2. RECOMMENDATIONS FOR STUDYING THE TOPIC

Lesson goal:

- To identify the procedure for registration of deaths and births in Ukraine
- Master methods of determination of total and specific birth rates
- To capture method for determining the general and specific indicators of mortality
- Learn to evaluate the results of calculations of fertility and mortality
- Learn to use the results of calculations of births and deaths in practice
- Learn to identify the natural growth of the population and to evaluate the results obtained

As a result of self-training, the student must know:

- A list of documents that can be used to study performance of Vital
- Procedure for registration of deaths and births in Ukraine
- Methods for determination of total and specific birth rates
- Definition of "natural population growth", "natural movement of the population" and be able to use them.

As a result of studying the subject, the student should be able to:

- Expect general and specific fertility rates
- Calculate the total and specific mortality
- Complete the medical records used for birth control
- Complete the medical records used for control mortality
- count rate of natural population movement
- Analyze and effective use of the knowledge and skills.

3. BASIC THEORETICAL MATERIAL FOR PREPARATION TO THE LESSON

3.1. DEMOGRAPHIC PROCESSES. NATURAL MOVEMENT OF THE POPULATION

Health of the population is characterized by the following statistics:

- the demographic;
- physical development;
- incidences;
- disability.

Demographic indicators form a basis for statistical studying of the population which is conducted in two directions:

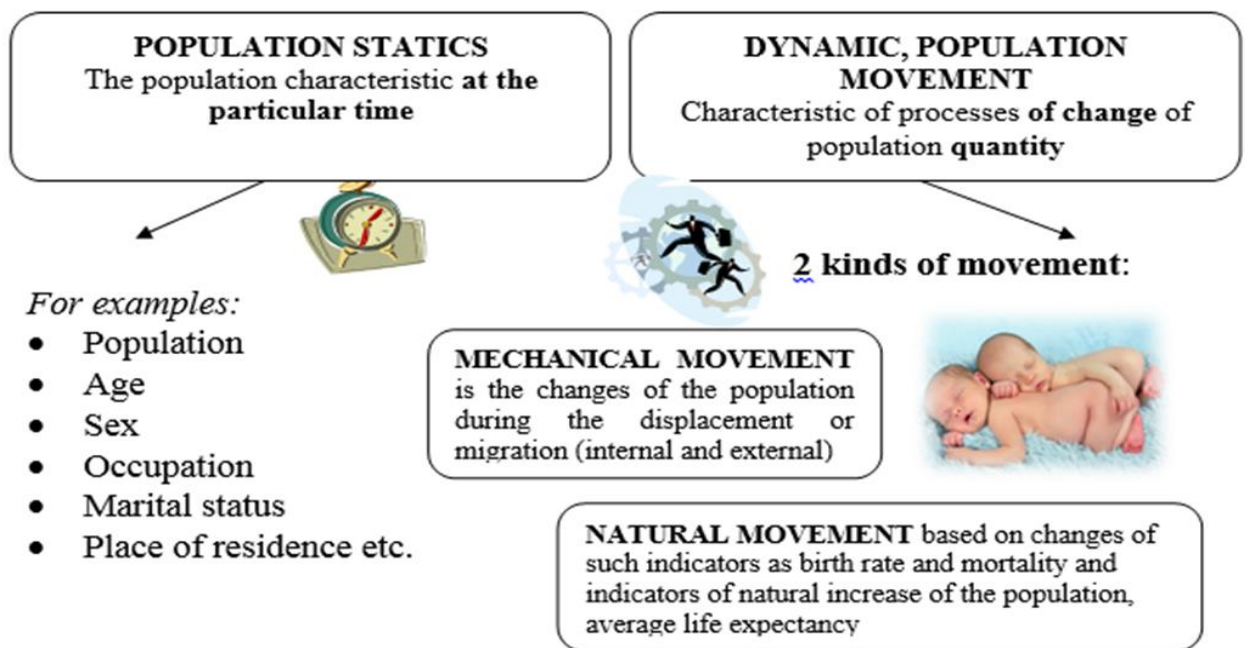
- 1) the population characteristic on a certain timepoint;
- 2) the characteristic of processes of change of population (dynamics or population movement) which is subdivided into mechanical movement and natural.

Demography – the science studying regularities of the phenomena and processes in structure, placement and dynamics of the population taking into account political, social, economic, biological and other factors.

Into problems of a demography enters: studying of territorial placement of the population, the analysis of tendencies and the processes happening among the population in connection with their social and economic living conditions, existing traditions, ecological, medical, legal and other factors.

Demographic indicators are used for a quantitative assessment of health of the population which is conducted in two directions: studying of statistics of the population and dynamics of the population.

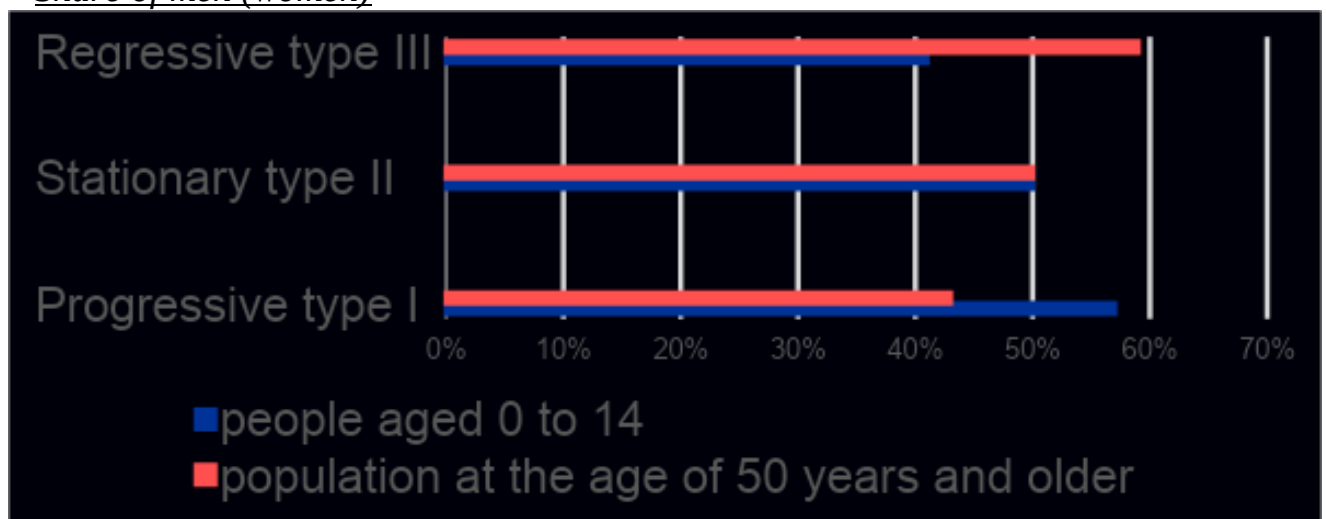
The statistics of the population is characterized by numerical structure of the population on a certain (critical) timepoint. It is studied on the following main sign: distribution on a sex, age, social and professional accessory, an education level, relationship status, a nationality, etc.



On age structure allocate progressive, regressive and stationary types of the population.

Progressive type I	Stationary type II	Regressive type III
the proportion of people aged 0 to 14 years <u>exceeds</u> than proportion of the population at the age of 50 years and older	the proportion of people aged 0 to 14 years is approximately <u>equal</u> to the proportion of the population at the age of 50 years and older	the proportion of people at the age from 0 to 14 years is <u>less</u> than proportion of the population at the age of 50 years and older

Share of men (women)



Share of men (women)

_____ × 100 = _____%

Population

Share of children aged 0–14 years

Number of children aged 0–14 years

_____ × 100 = _____%

Population

Share of population aged more than 50 years

Number of population aged more than 50 years

_____ × 100 = _____%

Population

It should be noted that by criteria of the international organizations, the population of the country is considered old if the share of aged people of 65 years and is more senior exceeds 74% of all population.

Dynamics of the population studies movement of the population and its quantity.

Allocate mechanical and natural movement of the population.

Mechanical movement of the population is caused by the migratory processes happening in the country which are understood as the movement of people connected, as a rule, with change of a residence.

Migration subdivide on irrevocable, temporary, seasonal. Along with it allocate external (departure out of borders of the country) migration and internal (movement within the country). External migration is subdivided into emigrations – departure of citizens to other country on a constant residence or long term and immigration – entrance of citizens from other country.

Natural movement of the population or reproduction is studied on the basis of such indicators, as birth rate, fertility, live birth, the general mortality, a natural increase of the population, average duration of the forthcoming life. The statistics of natural movement of the population is based on the current information: about the

birth, death, marriages, stains. To citizens is given: health certificate on the birth, perinatal death of the child, health certificate on death.

Organization of RAGS register so-called natural movement of the population (the birth, death), and police – mechanical movement (moving, arrivals, departures on other territories, to other countries). Social movement of the population (in the course of censuses on target polls) is at the same time studied also – changes in social structure of the population (an education level, professional, marriage and other statuses) are fixed.

Birth rate is a process of renewal of generations at the heart of which the biological factors influencing ability of an organism to reproduction of posterity (conception, fertilization) lie. At the same time level of birth rate is defined also by social and economic processes: age of marriage, factors of a way of life, traditions, religious doctrines and other factors.

3.2. METHODS FOR DETERMINING AND EVALUATING GENERAL AND SPECIFIC FERTILITY RATES

Birth rate indicators are:

Total (crude) birth rate	is quantity of live births per year to average annual population (‰)
Special (fertility rate)	is number of live births per year to number of women of childbearing (fertile) age (15-49 years) (‰)
Total reproduction rate	is average quantity of children born by the woman during fertile period

The policy directed on change of tendencies in birth rate, carries the name of the demographic.

Indicators of birth rate reflect medico-social well-being and are criteria of viability and population reproduction.

One of the important indicators characterizing birth rate, the general coefficient of birth rate which pays off as follows is:

Total birth rate indicator

Number of livebirths during the year

_____ × 1000 = _____ ‰

Average population

Special birth rate indicator

(fertility)

Number of livebirths during the year

_____ × 1000 = _____ ‰

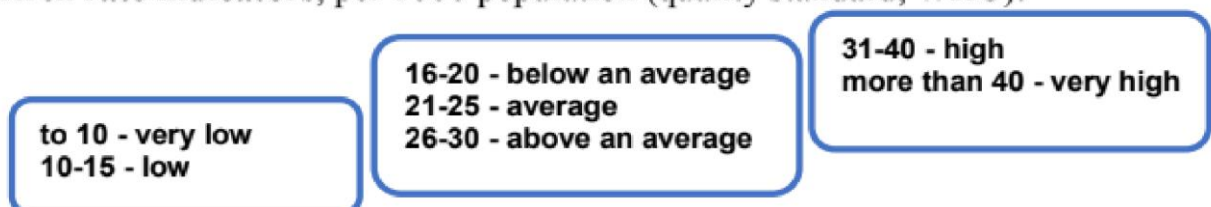
Average number of women

of fertile age (i.e. 15–49 years)

It is considered to be that low birth rate is characterized by an indicator lower than 15%, average – from 15 to 25% and high – more than 25%.

In the characteristic of processes of birth rate essential value has a total indicator (coefficient) of birth rate which shows, how many on the average children would be given birth by one woman throughout life on condition of preservation in each age group of existing level of birth rate.

Birth rate indicators, per 1000 population (quality standard, WHO):



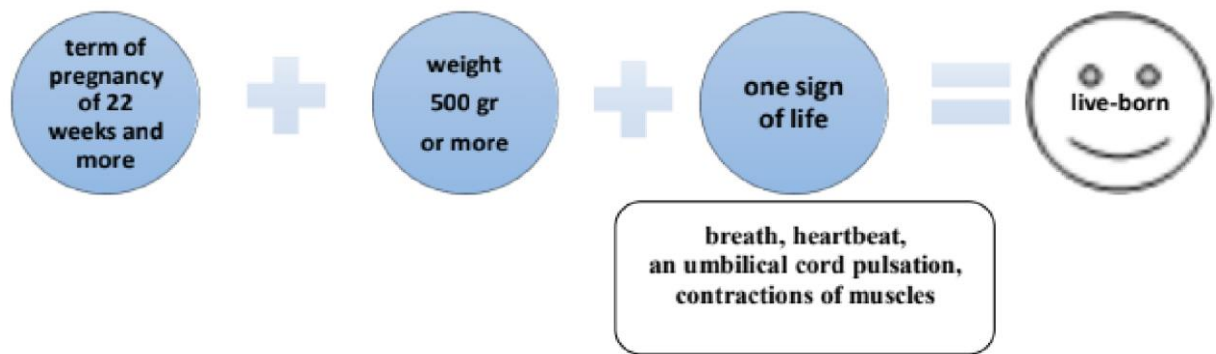
3.3. DOCUMENTS USED TO STUDY THE NATURAL MOVEMENT OF THE POPULATION. POSSIBILITIES OF THEIR APPLICATION

The statistical information on population is being gathered every 10 years based on population census as well as by means of following source documents of the Ministry of Justice, Ministry of Health, Ministry of Internal Affairs and State Migration Service:

- Birth record (source document of Ministry of Justice);
- Death record (certificate of death is attached to this document (source document of Ministry of Health, Form №106) information about still-born child and infants dead during first 0-6 days of life (source document of Ministry of Health, Form №106/2) is included in certificate on perinatal death);
- Marriage record (source document of Ministry of Justice);
- Divorce record (source document of Ministry of Justice);
- "A" Tear off stub attached to statistical record list on arrivals (source document of Ministry of Internal Affairs);
- "B" Tear off stub attached to statistical record list on departures (source document of Ministry of Internal Affairs);
- Official statistical report form "1-immigration" about foreigners getting residence permit in AR, and persons without citizenship" (information of the State Migration Service).

3.4. THE ESSENCE OF THE CONCEPTS OF "LIVE BIRTH", "STILLBIRTH", "DEATH OF THE FETUS". REGISTRATION PROCEDURE FOR BIRTHS IN UKRAINE

Most countries, including in Ukraine, use criteria of live birth and stillbirth, defined by World Health Organization. The newborn born alive is determined by following criteria:



Main reasons for decrease in birth rate.

The main reasons for decrease in birth rate are changes of "genital psychology" at inhabitants of our country in changing social living conditions. The first that led to change of psychology is a decrease in infantile mortality at the beginning of the XX century. This factor gradually changed psychology of mothers – their confidence that the been born child will survive. Other social factors, such as disappearance in the legislation of situation on distribution of land "heart-to-heart" influenced also, among country people. Legislative fixing of obligatory provision of pensions of all inhabitants became other factor (including not working) – parents had a confidence that they will be able to live on an old age of years without guardianship of children. Involvement in the late fifties - the beginning of the 60th years of the XX century of almost all women in a social production (till this period of 17 - 20% of women didn't work) became a factor influencing birth rate.

This fact led to change of terms of the birth of the first children and, respectively, a total of children who are earlier given birth during the genital period of women (15-49 years). I played a negative role and so-called "a syndrome of a parrot" - copying by peasants of behavior of city dwellers, the intellectuals in which families was on 1-2 children. At present to the specified factors the factor of a aging of the population – increase in a share of persons of advanced age in population structure with simultaneous reduction of a share of persons of the genital contingent and, respectively, was added number of the children's population. The state in principle is capable to influence birth rate effectively. How?

Growth of indicators of birth rate can be provided only in conditions when large families will live in the material and economic plan better or, in any case, isn't worse in any way than childless or few children families.

A **stillbirth** is when a fetus dies after the mother's 20th week of pregnancy. The fetus may have died in the uterus weeks or hours before labor. Rarely, the fetus may die during labor. Although prenatal care has drastically improved over the years, the reality is stillbirths still happen and often go unexplained.

A stillbirth is classified as either an early stillbirth, a late stillbirth, or a term stillbirth. Those types are determined by the number of weeks of pregnancy:

- **Early stillbirth:** The fetus dies between 20 and 27 weeks.
- **Late stillbirth:** The fetus dies between 28 and 36 weeks.
- **Term stillbirth:** The fetus dies the 37th week or after.

There are nearly 2 million stillbirths every year – one every 16 seconds. Over 40% of all stillbirths occur during labour – a loss that could be avoided with improved quality and respectful care during childbirth including routine monitoring and timely access to emergency obstetric care when required.

Experiencing a stillbirth during pregnancy or childbirth is a tragedy insufficiently addressed in global agendas, policies and funded programmes. There are psychological costs, especially to women and their families, such as maternal depression, financial consequences and economic repercussions, as well as stigma and taboo.

In 2014, the World Health Assembly endorsed the Every Newborn Action Plan (ENAP), which includes a global target of 12 or fewer stillbirths per 1000 total births in every country by 2030. By 2019, 128 mainly high-income and upper middle-income countries had met this target, but many countries have not. Around 84% of all stillbirths occur in low- and lower middle-income countries, however high rates of stillbirths can also be observed in high-income countries within vulnerable groups and ethnic minorities.

Fetal death refers to the spontaneous intrauterine death of a fetus at any time during pregnancy. According to the US National Center for Health Statistics, is the delivery

of a fetus showing no signs of life as indicated by the absence of breathing, heartbeats, pulsation of the umbilical cord, or definite movements of voluntary muscles.

Procedure for registration of births in Ukraine.

The statement for registration of a birth of the child should be submitted to bodies of civil registration (RACS is registration of acts of civil status) not later than 1 month from the date of a birth of the child, and at a birth of the dead child – not later 3 days in the birthplace of the child or a residence of parents. The registration procedure can be carried out directly in the maternity home.

The health protection institution gives out «Medical birth certificate» (the form No 103/o) for maintenance of registration of a birth of the child.

The fact of a birth of the child outside the maternity hospital is proved the medical certificate of the child staying under observation of medical institution (the form No 103-1) and two witnesses.

«Medical birth certificate» is filled on each child separately at the multiple births.

«Medical birth certificate» and «Medical certificate of perinatal death» are filled in the case of death of the child during 6 days after birth.

Only «Medical certificate of perinatal death» are filled in the case of stillbirth.

3.5. TOTAL MORTALITY. METHODS OF STUDYING MORTALITY, DEFINITION OF GENERAL AND SPECIAL INDICATORS, THEIR VALUE AND ESTIMATION

Mortality rate, or **death rate**, is a measure of the number of deaths (in general, or due to a specific cause) in a particular population, scaled to the size of that population, per unit of time. Mortality rate is typically expressed in units of deaths per 1,000 individuals per year; thus, a mortality rate of 9.5 (out of 1,000) in a population of 1,000 would mean 9.5 deaths per year in that entire population, or 0.95% out of the total. It is distinct from "morbidity", which is either

the prevalence or incidence of a disease, and also from the incidence rate (the number of newly appearing cases of the disease per unit of time).

The leading mortality causes of men and women are the following:

- the first place takes the circulatory system disease for both men and women;
- the second place for men is occupied by accidents, poisonings and traumas, and the third place malignant neoplasms;
- the second place for women had taken malignant neoplasms, and at the third place are the accidents, poisoning and injuries.

Mortality indicators (Death rate indicators):

- The **overall (total) mortality** characterizes frequency of cases of death for year on 1000 population, living on concrete territory.

Total mortality indicator

Number of deaths during the year

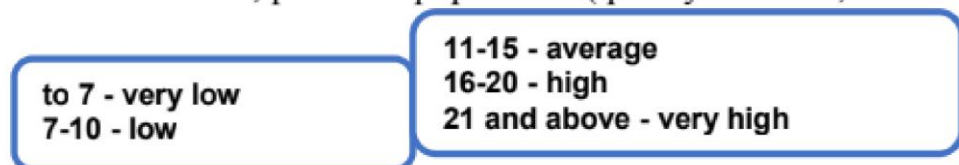
_____ × 1000 = _____ ‰

Average population

- **Special indicators** of death rate:

- Death rate on a sex (at men and women)
- On age (in separate age groups)
- For the reasons - death rate structure (caused by separate classes, groups of diseases).

Mortality rate coefficient, per 1000 population (quality standard, the WHO):



3.6. PROCEDURE FOR REGISTRATION OF DEATHS IN UKRAINE

Registration of death is performed within 3 days of day of death, and if it is impossible to obtain a document of a medical institution or a forensic medical report, the term is extended to five days.

In order to provide registration of death, in civil status registration authorities a health care institution provides the respective document — doctor's certificate of death (form 106-o).

In rural settlements, where there is only one doctor in a health care institution, in case of this doctor's absence (due to illness, vacation, etc.), feldsher's certificate of death is provided (form 106-1/o).

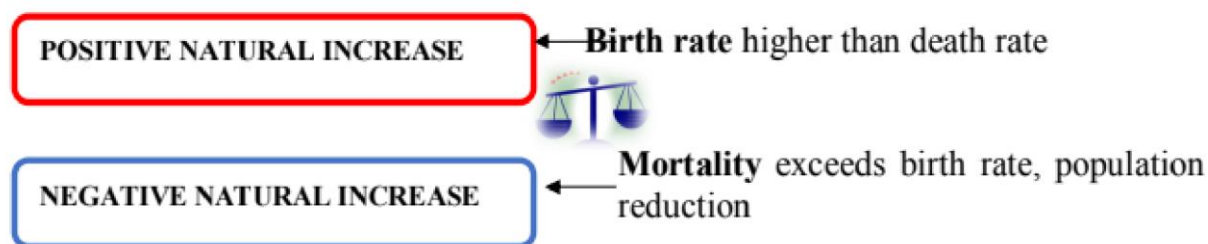
In case of death in transit (on a train, ship, plane, etc.), government registration of death can be performed by the nearest government civil status registration authority.

3.7. NATURAL POPULATION GROWTH

Natural increase is the difference between the numbers of births and deaths in a population; the rate of natural increase is the difference between the birthrate and the death rate. Given the fertility and mortality characteristics of the human species (excluding incidents of catastrophic mortality), the range of possible rates of natural increase is rather narrow. For a nation, it has rarely exceeded 4 percent per year; the highest known rate for a national population—arising from the conjunction of a very high birthrate and a quite low death rate—is that experienced in Kenya during the 1980s, in which the natural increase of the population approximated 4.1 percent per annum. Rates of natural increase in other developing countries generally are lower; these countries averaged about 2.5 percent per annum during the same period. Meanwhile the rates of natural increase in industrialized countries are very low: the highest is approximately 1 percent, most are in the neighbourhood of several tenths of 1 percent, and some are slightly negative (that is, their populations are slowly decreasing).

Natural population growth

birth rate indicator minus mortality indicator _____ = _____ ‰



3.8. DEMOGRAPHIC INDICATORS IN UKRAINE

The demographics of Ukraine includes statistics on population growth, population density, ethnicity, education level, health, economic status, religious affiliations, and other aspects of the population of Ukraine.

The modern demographic crisis in Ukraine is not a purely Ukrainian phenomenon; its causes are due to common civilizational trends of lifestyle changes and reproduction of the population inherent in the developed countries that have implemented the main phases of the demographic revolution in the 20th century. But a purely Ukrainian feature is that the demographic changes in our country have been under a significant negative impact of the economic crisis of the early 1990s, which greatly accelerated the growth of the negative demographic dynamics. After reaching a maximum number in 1993 (52.2 million) for all years the population decreased by 6.3 million people in 1993-2010. The most destructive modern demographic processes in Ukraine are the falling birth rates and the rising death rates. The birth rate compensates the mortality by 67%, i.e. the reproduction of the population is compensated only by two thirds. In Ukraine like in the economically developed countries the decline of birth is accompanied by an increase in the average life expectancy, which holds back the depopulation.

Urbanization:

1. As of 2015, urban/rural population ratio in Ukraine is 69.1/30.9%, respectively, meaning an ongoing urbanization.
2. Population density — 74.5 pop./km².
3. Eastern regions of Ukraine are more urbanized.

Sex ratio:

Generally, female population is prevalent in Ukraine (54%), but there is a pronounced trend of adjustment of this imbalance.

Age ratio:

1. Age structure of the population of Ukraine is characterized by decrease in share of children and increase in share of elderly people.
2. According to forecasts of the Ministry of Economy of Ukraine, by 2025 the share of elderly people will increase to 30%.

Type of age structure of the population:

As of 2015, there is a regressive age structure of the population in Ukraine.

Birth rate indicators:

1. In 1913 — 42.9 ‰
2. In 2010 — 10.8 ‰
3. Until 2002 — decrease of birth rate
4. Since 2002 — positive dynamics
5. In 2000–2010 — indicator's increase from 7.8 to 10.8 ‰ (by 31.0 %)
6. Rural population — 11.9 ‰, urban population — 10.4 ‰ (2010)
7. From 9.1 ‰ in Lugansk and Chernigov oblasts to 14.8 ‰ in Rivne oblast and 14.7 ‰ in Zakarpattia oblast

Mortality indicators:

1. In 1955–1965, total mortality of the population was 7.5–7.6 ‰
2. In 1965–2010 mortality has increased twofold (to 15.2 ‰), mainly at the expense of working-age population, notably male.

Natural population growth:

1. Positive — until 1991
2. Negative (depopulation) — since 1993

4. TEST QUESTIONS FOR SELF-CONTROL

1. Demographic indicators are all below, except:
 - A) Birth rate
 - B) Mortality
 - C) Infant mortality
 - D) Disability
 - E) The Natural increase
2. Natural movement of the population is characterized by following indicators:
 - A) Mortality, birth rate
 - B) Infant mortality, birth rate
 - C) Migration
 - D) Mechanical movement
 - E) All of the above
3. What data are required for studying of indicator of birth rate?
 - A) Number of born children
 - B) Number of live births
 - C) Average annual population
 - D) All of the above
 - E) Number of live births and average annual population
4. What data are needed for studying of the overall mortality?
 - A) Number deaths per year
 - B) Number of deaths of infants per year
 - C) Number deaths per year and average annual population
 - D) Average annual population
 - E) Number deaths per year and number of deaths of infants per year
5. Type of a natural increase of the population is typical for Ukraine:
 - A) Regressive
 - B) Negative
 - C) Stationary
 - D) Positive

E) Progressive

6. All these tendencies are characteristic for demographic situation in Ukraine, except:

A) The negative natural increase

B) Reduction of the rural population

C) Population aging

D) Progressive population type

E) Reduction the number of population

7. Progressive type of population age structure is characterized by following features:

A) The number of children exceeds the number of persons older than 50 years

B) The number of children less than number of persons older than 50 years

C) The number of children equals than number of persons older of 50 years

D) The number of middle aged people the most

E) The number of middle age people equals to number of children

8. The following data are required for calculation of fertility indicator:

A) Number women of childbearing (fertile) age

B) Number of live births

C) Number of stillborn

D) Number women of childbearing (fertile) age and Number of live births

E) Number women of childbearing (fertile) age and Number of stillborn

9. Citizen N. was born in the maternity hospital a healthy full-term baby. On the seventh day after birth the mother and child were discharged. At discharge mother warned of the need to register her child in the Registry office. How long after childbirth it has been done according to the current legislation of Ukraine?

A) Not later than three months

B) Not later than three days

C) Not later than one year

D) Not later than ten days

E) Not later than one month

10. One of the major demographic indexes of public health is infant mortality, which characterizes the level of medical securing of pregnant women. What accounting document is filling by doctor in case of newborn death at the age from 22 weeks till first six days (168 hours) of life?

A) Medical death certificate (form №106)

B) Newborn development card (form №097)

C) Medical certificate of perinatal death (form № 106-2)

D) Medical assistant's certificate of death (form №106-1)

E) Prenatal record of maternity hospital, maternity department of hospital (form №113)

Keys: 1 - D, 2 - A, 3 - E, 4 - C, 5 - B, 6 - D, 7 - A, 8 - D, 9 - E, 10 - C.

5. SITUATIONAL TASKS

Task. Based on the data below, calculate indicators of natural change in population and other demographic indicators:

- Total birth rate indicator
- Special birth rate indicator (fertility)
- Total mortality indicator
- Natural population growth
- Share of men (women)
- Share of children aged 0–14 years.
- Share of population aged more than 50 years.
- Type of age structure of the population
- Demographic burden indicator

In 2022, average population of the city N is 728 000.

This number includes 425 300 men, 346 700 women aged 15–49 years, 143 400 children aged 14 years or less, 154 600 people aged more than 50 years, 405 000 people of unemployable age (children, retired). In the year under review, there have been 6700 livebirths and 13 200 deaths.

Ministry of Health of Ukraine Medical facility name and address Identification code 		MEDICAL RECORDS Form of primary documentation № 103/r APPROVED by the Order HM of Ukraine 0 8 0 8 2 0 0 6 № 5 4 5
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MEDICAL BIRTH CERTIFICATE № _____ (issued for the registration in the Registry of civil status)
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“ _____ ”			
I. I am doctor, (feldsher, midwife), _____, (surname, first name, middle name)			
I confirm, that the citizen _____, (surname, first name, middle name)			
who lives at address: _____ State _____ Region _____			
District _____,		populated locality _____	
street _____ _____,		house _____,	flat № _____ in _____ _____ _____
			place _____ medical institution name, at home, other
Child was born in _____ year, month _____, day _____, hour _____			
Child: male, female (underline) with weight _____ gr. Special information:.....			
Signature of the physician (midwife, paramedic) _____			
I agree with above _____ (surname, first name, middle name of mother)			

Appendix 2

Ministry of Health of Ukraine Medical facility name, address Identification code I I I I I I I I I I		MEDICAL RECORDS Form of primary documentation №106-2/a Approved by the Ministry of Health of Ukraine 0 3. 0 7. 9 5 y. № 1 2 4
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Perinatal death certificate № _____
 (last, previous № _____)
 Date of delivery «____» _____ 20 ____ y.

1 – still born 2 – dead on the 1st week of life

1. Baby's family name, name and father's name _____

☐ male – 1, female – 2 (underline)

☐ Date of birth (stillbirth): year _____ month _____ date _____ hour _____

☐ Date of death: year _____ month _____ date _____ hour _____

☐ Date of death (stillbirth): _____

a) Country _____ republic, region _____
 district _____ town – 1, village – 2 _____

6) Death (stillbirth) was: in hospital – 1, at home – 2,
 in other place – 3 (underline) _____

6. Mother's family name, name and father's name

7. Mother's year of birth _____ 8. Nationality _____

9. Marital status: married -1, single – 2 (underline)
 For the married: date of marriage _____
 Husband's full name _____
 (The sheet is filled on the basis of passport note, according to mother's words (underline))

10. Place of mother's living (still born) _____
 Country _____ republic, region _____ district _____
 _____ town – 1, village – 2 _____, street _____, house _____

of mother's
 work

12. Quantity of previous pregnancy _____, from their with alive fetus _____ still born _____ abortions _____,

13. Term of this pregnancy _____ weeks
 with: doctor – 1, obstetric nurse – 2, assistant doctor – 3, others – 4 (underline)
 previous pregnancy alive fetus – 1, still born – 2, abortion – 3 (underline)

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Електронне навчальне видання комбінованого використання
Можна використовувати в локальному та мережному режимі

Боброва Оксана Вячеславівна
Цукор Наталія Григорівна

**МЕТОДИКА ВИВЧЕННЯ ТА ОЦІНКА
ПОКАЗНИКІВ ПРИРОДНОГО РУХУ**

Методичні рекомендації
до практичних занять для здобувачів вищої медичної освіти 3–4 року навчання
з дисципліни «Соціальна медицина, організація охорони здоров'я»

(Англ. мовою)

В авторській редакції

Підписано до розміщення 16.05.2023. Гарнітура Times New Roman.
Ум. друк. арк. 1.62. Обсяг 1,272 Мб. Зам. № 88/23.

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61022, м. Харків, майдан Свободи, 4.
Свідоцтво суб'єкта видавничої справи ДК № 3367 від 13.01.2009
Видавництво ХНУ імені В. Н. Каразіна