



**NATIONAL
BACKGROUND REPORT
ON MEDICAL RESEARCH
FOR MONTENEGRO**

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■ **ABSTRACT:**

This report was done for the needs of EC FP7 project WBC-INCO.NET in partnership with the Ministry of Education and Science, Government of Montenegro. The report is a brief overview of medical scientific research activities in Montenegro. It includes: legal framework, scientific research institutions and an overview of research activities in the last ten years. The last chapter of the report brings a brief account of socioeconomic conditions in Montenegro and the main directions of future medical research.



■ 1.1. OVERVIEW OF LEGAL INFRASTRUCTURE AND STRATEGY OF DEVELOPMENT


This field of reserach is partially covered by several laws and strategies of development:

- a) The Law on scientific research activities
- b) Strategy of scientific research activities in Montenegro (2008-2016)
- c) The Law on health care
- d) Strategy of health care development in Montenegro

a) ***The Law on scientific research activities***

The Law on scientific research activities^[1] regulates “scientific-research activities, organization, conditions and method of funding of the activities, as well as other issues important for carrying out scientific-research activities.”

[1] Official Gazette of the Republic of Montenegro, no. 71, 28 November 2005.

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- Scientific research activities, according to this law, include: fundamental, applied and development research activities as well as human resources training for scientific work.

- The Government establishes the Council for the Scientific Research Activities for facilitation of the scientific research activities. The Council analyzes the state and the achievements within scientific research activities and gives expert proposals to the Government. The Council is composed of nine members, appointed by the Government. One third of the Council members are appointed from the Government, and two thirds are appointed from the eminent experts from the scientific research area.



b) Strategy of scientific and research activities in Montenegro

Proposal of the Strategy of scientific and research activities of the Republic of Montenegro (2008-2016) was adopted by the Council for the Scientific Research Activities on 30 May 2008. The proposal was made by the Commission of the Council composed of nine members.



Montenegro has certain experience of creating scientific research programmes in the context of bilateral agreements with neighbouring countries and EU countries.


Active interdisciplinary international projects are funded by the German Rectors' Conference(1), Norwegian Council for Science(1), ERA-NET project within FP6(3), bilateral cooperation(9), INTERREG(1).


In two rounds of FP7 there have been 58 project proposals in which partners from Montenegro participated. In the first round 7 projects received funding (1-research project, 3-European network of national contacts for FP7, and 4 projects of coordination and support).

Within TEMPUS III programme 15 JEP projects, 9 SCM and 31 IMG have been realized.

Student mobility has been realized through CEPUS, TEMPUS, INTERREG programmes, IAESTE, and SEE-ERA-NET.(350 students mobility for 4 years)

The Montenegrin Academy of Sciences and Arts has participated in the activities of ALLEA, EASA, EMAN, IACSEE, ICSU, CEEN and realized activities in joint projects as well as study visits to 22 national academies of sciences and arts.

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- **Prioritised fields and activities in the period 2008-2010 (short term plan) are:**
 1. Reorganization of institutional and administrative structures
 2. Development of staff resources and infrastructure
 3. Informatics and library capacity
 4. Technological development and information



■ **Prioritised fields and activities in the period 2010-2016 (long term plan)**

In the period 2010-2016 resources should be used for staff, infrastructure and technological development and innovations.

c) ***THE LAW ON HEALTH CARE***


The Law on Health Care treats scientific research activities in several articles. Article 36 states that “The scientific research and scientific activity shall be organized and conducted on the tertiary health care level”; article 47: “The Clinical center shall be the teaching facility of the school of medicine and it shall perform the teaching and scientific research activity within clinical branches of medicine, in accordance with the law”; article 48: “The Special Institute shall perform also the teaching and scientific research activity, in accordance with the law”; and article 49: The Institute for Public Health “researches and develops activities within public health area, health policy, and creates public health programs”.

d) STRATEGY OF HEALTH CARE DEVELOPMENT IN MONTENEGRO (SEPTEMBER 2003)

By adopting “Health policy in the Republic of Montenegro until 2020”, Montenegro has joined a unique international process of implementing papers of the World Health Organization 'Health for all in XXI Century' and '21 objectives for the 21st Century'. The health care policy strategy established by way of this document is founded on improving the quality of health of the population, by adapting and improving activity of the health care system in harmony with financial abilities. Health policy in Montenegro until 2020 has defined general objectives of health policy: extending life expectancy, improving quality of life relating to health, decreasing differences in health and financial risk insurance.

- The health care system is organised as a unique health care region and is based dominantly on the public sector. Public health care institutions are organized through a network of primary, secondary and tertiary health care consisting of eighteen medical centres, seven general hospitals, three special hospitals, the Clinical Centre of Montenegro, the Institute for Health and the Pharmaceutical Institute of Montenegro. The private sector, not yet integrated in the health care system, comprises a larger number of medical centres, dental centres, wholesale medicines and pharmacies.

- The Strategy analyzes state of health of the population. Positive and negative indicators show the state of health of the population: birth rate, mortality, natural increase and vital index. The state of health of the Montenegrin population, measured according to health indicators, is level with countries of Eastern and Central Europe. However, values for the most frequently used health care indicators lag behind the values of Western European countries. Quality health care and services as a parameter for efficiency of the health care system has not been researched in health care institutions. The reasons for improving the system of control may be found in a lack of professional standards, non-developed information system, as well as the lack of a complete evaluation of the health care program.

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- Health Information System (HIS) is one of the basic components of contemporary health care system in Montenegro. The trend in this area is mostly founded on two strategies:
 - making a network of all local information systems and creating an integral health information system(Project of Fund for Health care of Montenegro is ongoing)
 - development and quality improvement of information service in health care.

1.2. INSTITUTIONAL FRAMEWORK OF SCIENTIFIC RESEARCH ACTIVITIES

Medical research is carried out in:
Montenegrin Academy of Sciences and Arts, University of Montenegro, School of Medicine, Institute for Public Health, Center for Science of the Clinical Center Republic of Montenegro.

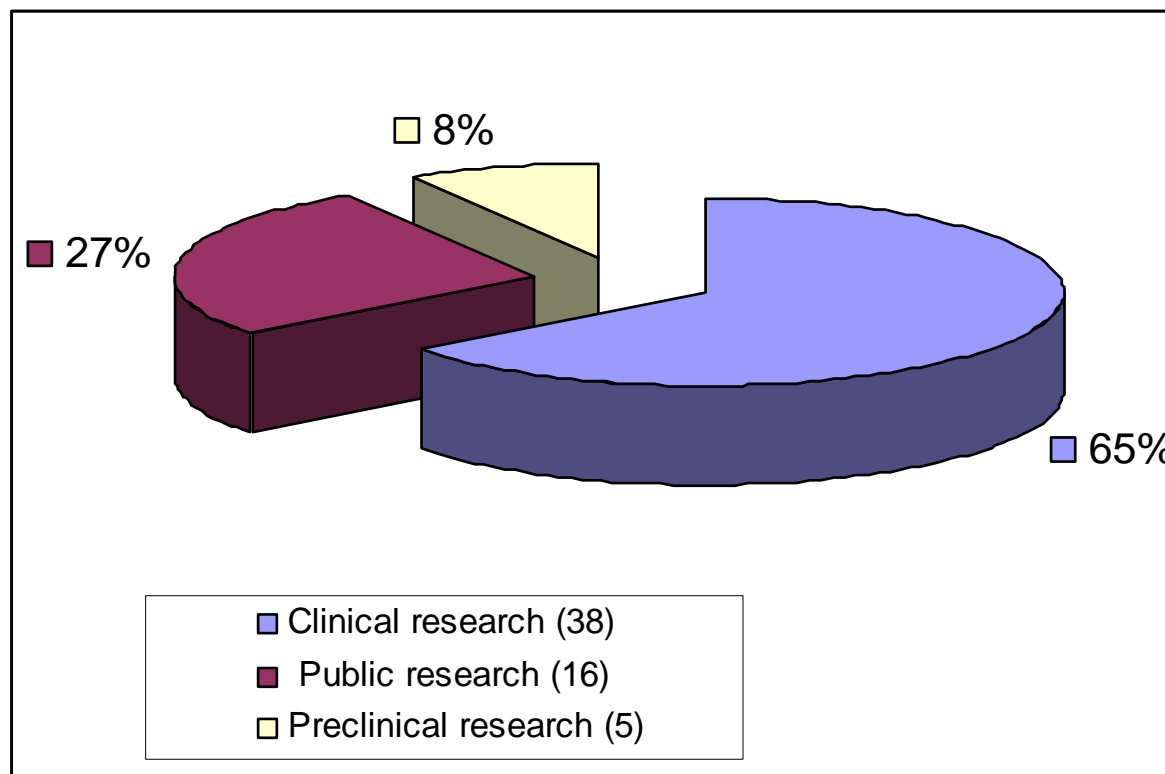
2.1. SCIENTIFIC PROJECTS

2.1.1 National medical scientific research projects in Montenegro

In the last ten years 59 research projects of public research institutions have been approved in Montenegro.

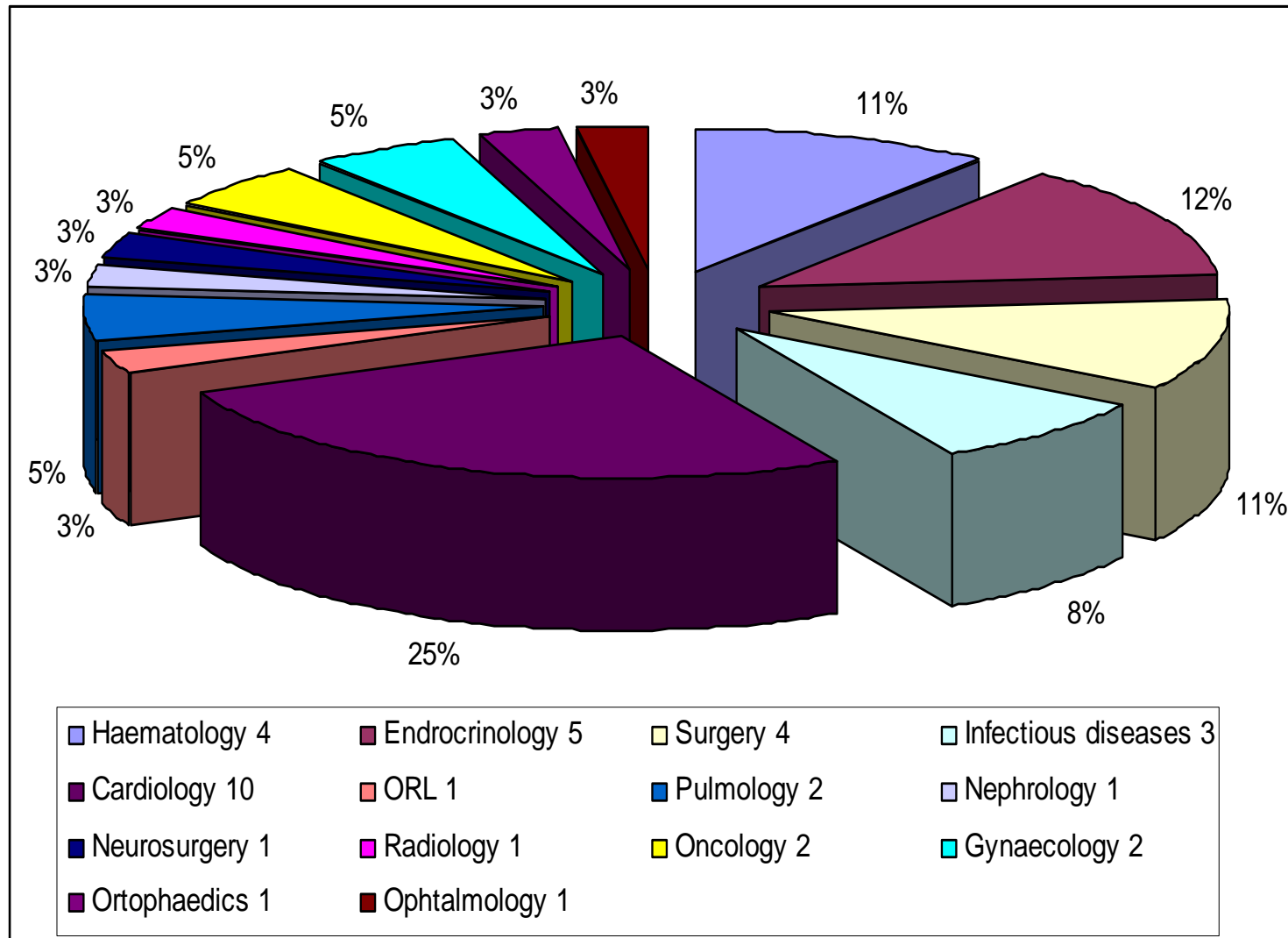
Almost two thirds of projects are clinical research (65%), public health research amounts to 27%, and preclinical research accounts for 8%, as shown on Fig. 1. The Ministry of Education and Science of Montenegro has supported their realization.

Figure 1. Types of medical scientific research projects in Montenegro



Of 38 clinical research projects 7 are experimental clinical studies of which four belong to internal medicine and three to the field of oncology.

Figure 2. Overview of research projects in clinical specialties



2.1.2 Projects approved by Ethics committee of the Clinical Centre of Montenegro

Out of the aforementioned projects (59 in total) 13 have been approved by Ethics Committee of the Clinical Center, of which 7 are fundamental, experimental studies of applied research type, and another 6 are descriptive studies, mostly of analytic type (all the projects belong to the field of clinical research). Two of them are partner projects. The largest number is in the field of oncology (6), followed by cardiology (2) and 5 belong to other fields.

2.1.3. Projects of the Montenegrin Academy of Science and Arts

Five of the aforementioned projects are supported by the Montenegrin Academy of Science and Arts, of which four belong to the field of public health and one is a clinical research in the field of neurosurgery.

2.2. OTHER SCIENTIFIC RESEARCH ACTIVITIES

2.2.1 Doctoral dissertation research in the field of medicine

Figure 3. Doctoral dissertation research and fields of study

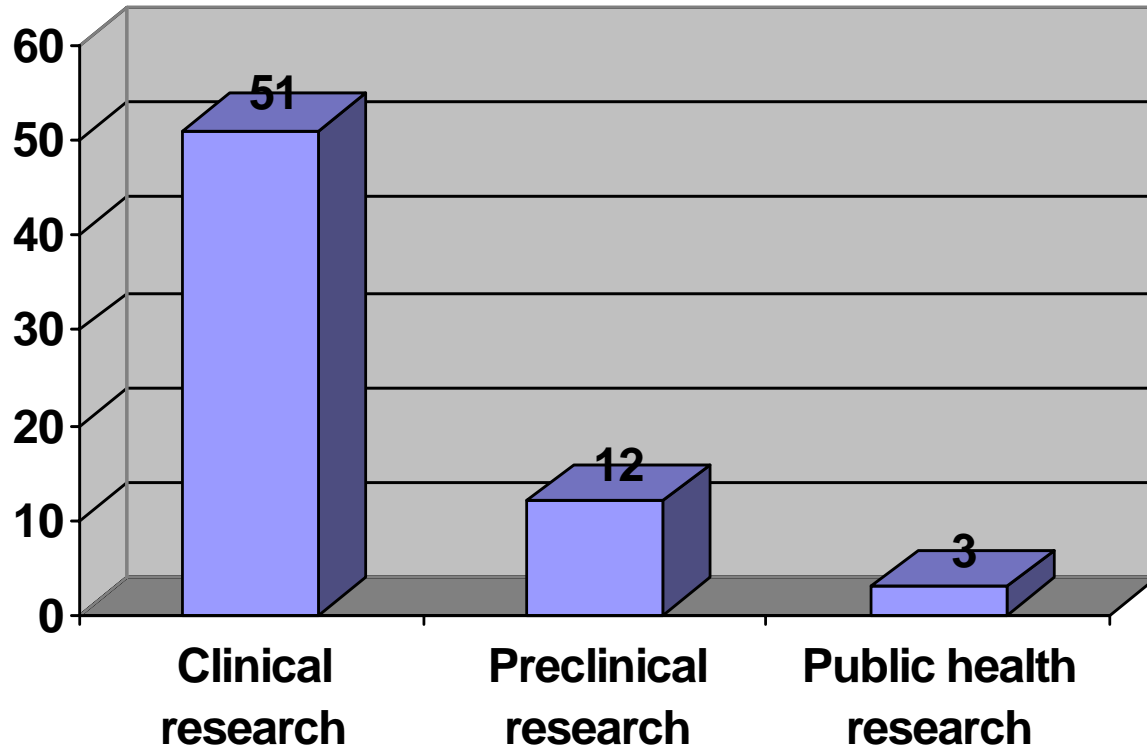
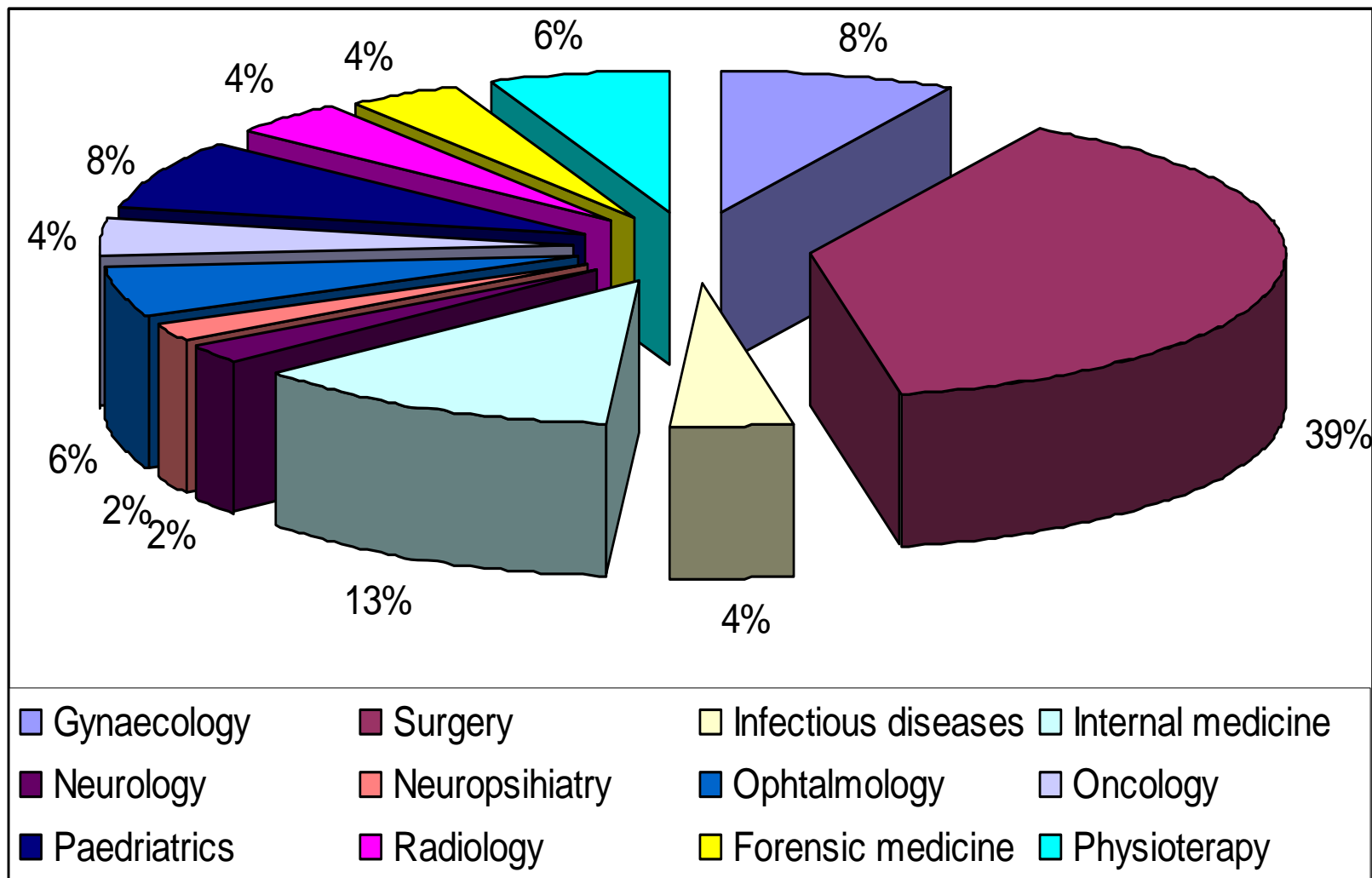



Figure 4. Doctoral dissertations in the fields of clinical research




3.1 INFLUENCE OF SOCIO-ECONOMIC CIRCUMSTANCES AND HEALTH POLICY ON SCIENTIFIC RESEARCH ACTIVITIES

Health care policy in Montenegro until 2020 has defined general objectives of health policy: extending life expectancy, improving quality of life relating to health, decreasing differences in health and financial risk insurance.


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- Between 1956 and 2006 the population of Montenegro increased from 440,998 to 624,240 in 2006, which represents a total increase of 41.55%.

- According to 2003 Census of population in Montenegro, there were 12.8% percent of people older than 65 in general population (of which 10.5% males and 13.4% females) and this number is constantly increasing like in all other European countries: Austria (16.7%), Croatia (17.3%), France (16.3%), Germany (18.3%), Greece (18.5%), Serbia (16.5%). Old people's needs for health care are 3.5 to 4.5 times greater than the needs of population younger than 65.

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- Problem of poverty in Montenegro (according to Statistical Office of the Republic of Montenegro - Monstat) show that 11.3% of the population is poor and the largest number of poor people live in the north region (18.3%).


- According to 2003 Census of population in Montenegro, there were 12 617 illiterate persons or 2.3% of all the population of Montenegro. Average percentage of illiterate persons in Europe is around 1.5%. Of the total number of illiterate persons in Montenegro, 69% are older than 65 and 90.4% are women.


- The life expectancy in Montenegro is, according to the latest available data from 2004, **73.25 years** (69.76 years for men and 76.09 years for women). These figures are considerably lower than the average figures for developed European countries (**76-79** years for men, and **80-84** years for women, i.e., for both sexes somewhat less than 80 years), but are similar to other Balkan countries and its surroundings (source - Health for all database, WHO Office for Europe).


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- One of the most important health problems in Montenegro is death due to preventable causes that are the consequence of certain lifestyle: smoking, inadequate dietary habits, insufficient physical activity, alcohol and drug abuse, etc.


- The existing health care resources, within the framework of the public sector, indicate the accessibility and development of health care infrastructure, especially with regard to the number of beds and number of inhabitants (643 beds per 100,000 inhabitants in public health sector). The physician: population ratio increased and in 2005 was 1.97, that is, one doctor per **508** inhabitants (according to the data of the Fund for Health and the Ministry of Health for 2005).


- The mortality rate of newborn babies in Montenegro, a very significant indicator of the state of health of the population and development of health care services, as well as an indicator for socio-economic, educational, cultural and other social developments, has a positive trend, and in 2004 it was 7.8 per 1,000 newborn babies. Besides lower mortality rate of newborns, mortality rate of children under the age of 5 has decreased.


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- The rate of maternal mortality has had a zero value for years now, which indicates that in Montenegro there are no deaths as a consequence of pregnancy, delivery or postpartum period.


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- **Leading causes of death in Montenegro** (according to disease groups by MKB-10) in 2006 were: bloodstream diseases (56.8%), malignant neoplasms (16.3%), injuries, poisoning and consequences of effects from external factors (4.9%), respiratory diseases (4.3%), diabetes mellitus (2.0%), other diseases (6.3%) and a high percentage (9.4%) of insufficiently defined conditions marked as symptoms, signs and pathological and clinical test results


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- In the group of deceased persons the number of treated patients grew, while the number of untreated fell. Thus the ratio of treated : untreated in 1966 was 58.3% to 41.7% and in 2006 it was 94.9% to 5.1%



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- Key areas of biomedical research activities in developed countries will be subject to medical research in Montenegro as well, in accordance with our possibilities and the level of technological development


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- Malignancy (breast carcinoma, prostatic carcinoma, colorectal carcinoma, leukemia, etc.)
 - Infectious diseases (HIV, SARS, hepatitis C),
 - Heart and lungs disorders (hypertension, acute infarction, chronic bronchitis),
 - Neurological diseases (Alzheimer's disease, multiple sclerosis, Parkinson's disease, cerebrovascular insult),
 - Disorders of the digestive, urogenital tract, diabetes (diabetes type I and II)
 - Liver cirrhosis, cholecystolithiasis, glomerulonephritis.


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- Cancer is a disorder with high incidence, prevalence, health care cost and social impact. Gastric, lung and breast cancer are key areas in this context. Particular areas of interest for researchers in Montenegro are: new strategies to fight cancer resistance to current treatments, and further development towards clinical trials.

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- Infectious diseases will remain for long time threat for human species and should be addressed every year. The focus should be on children population and on some specific topic not covered enough in the past.

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- In area of cardiovascular diseases the focus will be on diagnosis, prevention, treatment and monitoring of heart vessel diseases using broad multidisciplinary approaches.

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- The most important factor that will enable the development of medical scientific research activities is, above all, adequate education of professionals, both at graduate and postgraduate level.

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- The process of educating students at medical schools has to include lectures given by visiting professors and scientists from abroad who can adequately present results and new tendencies of development and application of technologies in medicine.

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- Higher education institutions should keep updated and be able to provide high quality education, to stimulate students to continue with scientific activities in the country and abroad and to create conditions for young researchers to make advances in the academic world.



■ 4. SWOT ANALISYS

- Strenghths
- Opportunities
- Weaknesses
- Threats

■ **Strenghts**

- Overall vision of the health care system development
- Increase in scientific potential and scientific staff (number of doctors of sciences and masters of sciences)
- Existing possibilities for educating medical staff at domestic institutions
- Increase in the number of research activities and published papers and books, collections of papers, articles in the country and abroad
- Possibilities for professor and student mobility with an aim to improve their knowledge
- Readiness of scientists, professors and associates to adapt to changes brought by modern scientific and technological progress
- Integration of health care system into the international health care system and significant support by international institutions in that respect

■ Opportunities

- Possibilities to make use of financial, professional and technical support through participation in programmes funded by European institutions
- “The Bologna process” – new opportunities
- Establishing cooperation with scientific institutions and university units of elite universities
- Transfer of knowledge of scientists and professors that spend long periods of time at elite universities abroad
- Engagement of young researchers on projects that best contribute to valuation of objective reserves and resources



■ Weaknesses

- Poor treatment of science
- Low amount of financial support from GDP for scientific research activities
- Insufficient investment into development of scientific research laboratories
- Absence of stimulative measures for doing scientific research activities
- Lack of scientific research infrastructure
- Lack of networking with international scientific teams
- Lack of strong economy able to support and use the results of scientific research activities
- Lack of state mechanisms for popularisation of scientific research activities
- Small number of basic medical research

■ Threats

- Insufficiently defined, stable and stimulative surroundings for the development of scientific research activities can prevent or slow down their integration into the European scientific space
- Insufficient investments into public health institutions and hospitals and outdated equipment
- Physician:patient ratio in Montenegro is lower than in Europe
- Scientists will be oriented towards health care, teaching and administrative work
- The most talented researchers move to countries that offer better opportunities for science research activities