NATIONAL PROGRAMME
ON OCCUPATIONAL HEALTH AND SAFETY FOR PERSONS EMPLOYED IN HEALTH CARE

for the period 2015-2020

Zagreb, February 2015

Contents

I. INTRODUCTION

Reaching of the National Programme on Occupational Health and Safety for Persons Employed in Health Care for the period 2015-2020, and the accompanying definition of the occupational health and safety policy for persons working in health care, constitute the obligations stemming from the International Labour Organization (ILO) Convention no. 155 on Occupational Safety and Health, the Occupational Health and Safety Act of the Republic of Croatia, and the Health Care Act.

The Proposal of the National Programme on Occupational Health and Safety for Persons Employed in Health Care for the period 2015-2020 (hereinafter referred to as the National Programme) has been prepared by the Ministry of Health in cooperation with the WHO Collaborating Centre for Occupational Health in the Republic of Croatia, the Ministry competent for labour issues, and organizations responsible for the protection and improvement of occupational health and safety of persons employed in health care in the private and the public sector:

Ministry of Labour and Pension System
National Council for Occupational Health and Safety
Croatian Institute for Protection of Health and Safety at Work
Croatian Medical Association
Croatian Society on Occupational Health of the Croatian Medical Association
Croatian Medical Chamber
Croatian Medical Union
Croatian Nursing Council
Croatian Nurses Association
Croatian Trade Union of Nurses and Medical Technicians

The following institutions have also provided their expert contribution in the process of preparation of the National Programme:

Croatian Chamber of Pharmacists
Croatian Chamber of Medical Biochemists
Croatian Dental Chamber
Croatian Chamber of Health Professionals
Croatian Chamber of Midwives
Croatian Health Insurance Fund

Ministry of Science, Education and Sports

Education and Teacher Training Agency

Agency for Quality and Accreditation in Health Care and Social Welfare

The National Programme is based upon the following methodological structure:

- Vision of development (strategic principles; fundamental goals and purpose)
- Overview of the situation (conceptual foundations; the current state of affairs: institutional and legal frameworks)
- Needs (key problems; specific measures; monitoring and assessment indicators)

The proposal for the drafting of the National Programme has been prepared by the members of the Working Group for the Preparation of the National Programme on Occupational Health and Safety for Persons Employed in Health Care:

- Prof. Jadranka Mustajbegović, MD, PhD, Head of the WHO Collaborating Centre for Occupational Health in the Republic of Croatia;
- Dunja Skoko – Poljak, MD, Head of the Sector for Public Health of the Ministry of Health of the Republic of Croatia;
- Marijana Pavlić, prof., Senior Adviser at the Ministry of Health;
- Ivica Orač-Šukelj, dipl. ing., Senior Adviser at the Ministry of Labour and Pension System;
- Prim. Marija Zavalić, MD, PhD, President of the National Council for Occupational Health and Safety;
- Bojana Knežević, MD, PhD, Croatian Institute for Protection of Health and Safety at Work;
- Prim. Viktorija Bradić, MD, PhD, Executive Committee of the Croatian Medical Association;
- Prim. Azra Huršidić Radulović, MD, PhD, President of the Croatian Society on Occupational Health of the Croatian Medical Association;
- Prim. Katarina Sekelj-Kauzlarić, MD, Member of the Executive Committee of the Croatian Medical Chamber;
- Ivica Babić, MD, MSc, President of the Croatian Medical Union;
- Katarina Dugina, BScN, President of the City of Zagreb Office, Croatian Nursing Council
- Josipa Bišćan, bacc. med. techn., President of the Management Board of the Croatian Nurses Association and President of the Society for Quality of the Croatian Nurses Association
- Ljiljana Sambol, nurse, President of the branch of the Croatian Trade Union of Nurses and

II VISION OF DEVELOPMENT

Vision: Improvement of health of persons employed in health care

The importance of the protection of occupational safety and health of persons employed in health care is recognized at the global level. In May 2007, 193 member states of the World Health Organization confirmed the Workers' Health: Global Plan of Action (GPA), accepting the 10-year action plan which foresees the development of national programmes on occupational health and safety for persons employed in health care. The World Health Report 2006 – Working Together for Health includes an assessment that there is a global lack of health care professionals, and a noted need to provide them with support and protection. In response, the World Health Organization (WHO) initiated the campaign "Treat, Train, Retain", and, in December 2009, this organization, in cooperation with its Global Network of Collaborating Centres for Occupational Health and the International Labour Organization, developed the Joint Global Framework for National Occupational Health Programmes for Health Workers.

In March 2012, WHO prepared the Global Master Plan in cooperation with its Global Network of Collaborating Centres for Occupational Health, aiming to promote GPA implementation in the period from 2012 to 2017. On the basis of the conclusions of the World Health Assembly of 2007, WHO member states have committed to developing national occupational health programmes for health workers, and also to reporting to the World Health Assembly on progress and implementation of these national programmes in the course of 2013 and 2018. WHO prepared the Joint Global Framework for National Occupational Health Programmes for Health Workers in order to assist countries in the drafting of national programmes. The Framework for the drafting of National Programmes is compliant with the ILO Convention on Occupational Safety and Health (No. C-155), Promotional Framework for Occupational Safety and Health Convention, 2006 (No. C-187), and the Nursing Personnel Convention, 1977 (No. C-149). In accordance with these documents, and in accordance with the National Health Care Strategy 2012-2020, every activity within the health care system must be covered by the development of specific occupational health and safety programmes, appropriate for the needs of that particular activity.

1. STRATEGIC PRINCIPLES

The strategy of the National Programme is founded upon the implementation of the following principles, equal in value and mutually linked:

• Principle of sustainable development

The modernization and improvement of health care effectiveness must be approached in a sustainable manner. Development should not result in using human resources in a manner that would prevent their continuous progress and development. Therefore, measures being undertaken for the protection of occupational health and safety, focused on mitigating the risk at work, constitute the strategic elements of sustainable development that protects human resources.

• Principle of prudence

Rising diversity of activities at work, coupled with the use of new and more complex production systems and technologies, lead towards a continuous rise in the number of increasingly pronounced risks in work processes. In all those cases in which the risk of serious or permanent damage to health cannot be excluded, risks must be reduced to the minimum by applying the principle of prudence. In case of doubt, one must be prepared for the worst possible outcome and the biggest risks, as well as for risk mitigation and management. A good example of such risks would be risks in connection with dangerous chemicals, biological hazards and ionizing radiation.

• Principle of prevention

Sustainable development, and the reduction of risk to a socially acceptable level, are connected with action on the basis of the fundamental principle of prevention. The structuring of occupational health and safety in health care at all levels must be focused on the timely prevention of hazards, rather than merely on the subsequent resolution of consequences, in order to efficiently protect human lives, health and safety. At the same time, the activity of occupational health and safety should constitute support to technological development, and an incentive for the provision of services in health care without harmful environmental effects.

• Principle of partnership

The establishment and functioning of a modern occupational health and safety setup requires partnership of all stakeholders and mutual coordination, and the prerequisite for that are mutually created conditions that can enable joint performance of tasks. While it is founded upon precisely defined responsibilities, the partnership should also encompass effective and permanent cooperation of executive governmental bodies and representatives of employers and workers, as well as representatives of activities connected with health and safety, and with the world of labour

in general, such as technical safety; public health; social security; fire protection; environmental protection; standardization and maintenance of health service quality; patient safety; etc.

2. FUNDAMENTAL GOALS

The fundamental goals of the National Programme at the national level and the workplace level are the following:

• Implementation of specific health care by occupational health services

• Ensuring sufficient funding for:
  – The programme;
  – Implementation of specific occupational health and safety; and
  – Necessary protective equipment at work and equipment for safety at work

• Promoting active involvement of commissions and committees for occupational health and safety in the implementation

• Vocational education and training prior to employment and periodically, with obligatory involvement of contractual specialists in occupational health and safety, at all levels:
- Management;
- Direct managers;
- Occupational health and safety committee; commissioners and authorized officers for occupational health and safety; commissions for the prevention and control of healthcare associated infections in health care facilities
- Employees

• Identifying risks, harms and exertions
- At the workplace;
- In working conditions;
- In the method of work: the manner in which certain tasks or working procedures must be conducted, especially in terms of the duration of work, monotonous work, and result-

based work

- Applying hierarchy in the control of harms at the workplace and avoiding risks, harms and exertions by applying (1) basic and (2) specific occupational health and safety rules

1) Basic occupational health and safety rules according to Article 9 of the Occupational Health and Safety Act

a) In the performance of tasks, occupational health and safety rules eliminating or mitigating the danger in connection with the means of work (basic occupational health and safety rules) should be primarily applied.

b) Basic occupational health and safety rules include requirements a means of work must meet when in use, in particular: protective equipment for the means of work; protection against electric shock; prevention of fire and explosion; securing stability of the building in terms of static and dynamic load; securing the necessary work area and work space; securing necessary passage routes, transport and evacuation of employees; securing cleanliness, required temperature and air humidity; securing air velocity limits; securing required illumination of the workplace and the working environment; limiting noise and vibration in the working environment; protection from adverse weather and climatic impacts; protection from substances harmful to health; protection from electromagnetic and other radiation; securing spaces and devices for personal hygiene.

2) Specific occupational health and safety rules

If risks for safety and health of employees (persons at work) cannot be eliminated by applying basic occupational health and safety rules, specific occupational health and safety rules are applied. These rules contain certain conditions in regard to age, sex, level of professional education and training, health status, psychological and physical abilities, which employees must meet when performing work that entails special risks (working conditions). In addition, these rules also include the following:

a) obligation and methods of use of appropriate personal protective equipment and devices;

b) special procedures while using hazardous working substances;

c) obligation to place warning signs regarding certain risks and harms;

d) procedures in regard to an injured or sick employee up to his/her admission to a

competent health facility for treatment.

• Promoting
  - Reporting on exposure, percutaneous injuries and other injuries;
  - Removal of obstacles to reporting;
  - Support for an environment which is not about finding the culprit, but rather about finding a solution for the situation that has arisen

• Using appropriate IT systems
  - Data collection, monitoring, analysis and reporting, coupled with reacting on the basis of collected data

• Promoting research on occupational health and safety
  - In particular in regard to multiple exposure;
  - Applied intervention measures

• Prevention measures must:
  - Ensure the highest possible level of safety and protection when it comes to the health of workers (persons at work);
  - Be included in all work processes at the employer, and at all levels of work and management organization

3. PURPOSE

The purpose of the Programme is to protect and improve health, and to prevent and decrease:
• Accidents at work;
• Injuries at work;
• Occupational diseases and work-related diseases;
• Economic losses due to injuries at work, occupational diseases and work-related diseases (sick leave, premature and disability retirement).

In order to achieve the vision, goals and purpose, competent state and public administration bodies, the Croatian Parliament, the Government of the Republic of Croatia, the National Council

for Occupational Health and Safety, various chambers, trade unions, employers, health facilities and persons employed in health care must all be actively involved in the implementation of the National Programme.

III. OVERVIEW OF THE SITUATION

1. CONCEPTUAL FOUNDATIONS

In the context of this National Programme, a person at work is a worker (natural person performing certain tasks for the employer within employment); assigned worker under the general labour regulation; apprentice; pupil or student on work experience; person at training for work; person working while serving a prison sentence or correctional measures; person working as a volunteer; pupil, student or another person performing work on an occasional basis.

Another person is a person located at the workplace in any capacity (such as e.g. business associate, etc.).

A workplace is any place, area or room under the supervision of the employer where workers (persons at work) perform tasks or have access to it in the course of work – *Ordinance on Occupational Health and Safety for Workplaces* (Official Gazette no. 29/2013).

Occupational health and safety for persons employed in health care in the Republic of Croatia should be developed in the following areas:

- Human rights – the state has the obligation to aim at achieving and improving the state of affairs that would correspond to civilizational achievements of European states. In this area, one important aspect is the right of the worker (person at work) in health care, as well as the right of his/her family and children, for that worker to be protected at work against any threat to one's life and health.
- Population policies – in addition to the importance of promoting birth rates, it is important to design and implement measures aimed at decreasing mortality, disability and damage to reproduction health. There are well-known activities in place to decrease threats to life and

health in traffic, or to decrease the danger stemming from various forms of addiction to the very minimum, which is why it is equally important to define such goals for work in the health care sector as well.

- Development of the provision of services in the health care sector – it is important to promote the adoption of state-of-the-art technologies that have proven to be reliable for safety and health of workers (persons at work) themselves, safe for the environment, and feasible for the health care system in the long term.
- Cost reduction in the health care sector – a significant number of employers in the health care sector do not apply occupational safety and health measures, which is causing substantially higher costs to employers in return, due to repair of malfunctioning equipment, delays in work, misdemeanour fines, court expenses and costs resulting from damage claims by workers (persons at work).
- Cost reduction for the State Budget – when it comes to the fulfilment of rights of injured and sick workers (persons at work) in the health care sector, and rights of the families of the deceased workers (persons at work), cost reduction is possible in terms of reduced costs for the Croatian Health Insurance Fund, Croatian Pension Insurance Institute, social welfare system, court expenses and state administration costs.

1.1. Health care sector

The Act on the National Classification of Economic Activities (Official Gazette no. 98/94) and the Decision on the National Classification of Economic Activities (NKD 2007; Official Gazette no. 58/07 and 72/07) prescribe the method of classification for economic activities of legal entities and natural persons performing economic activities in accordance with the regulations, state government and administration bodies, and local self-government and administration units (Table 1).

Table 1. Economic activities in health care according to the National Classification of Economic Activities – NKD 2007

86			Human health activities
	NKD 86.1		Hospital activities
		NKD 86.10	Hospital activities
	NKD 86.2		Medical and dental practice activities
		NKD 86.21	General medical practice activities
		NKD 86.22	Specialist medical practice activities

NKD 86.9	NKD 86.23	Dental practice activities
		Other human health activities
	NKD 86.90	Other human health activities

1.2. Human resources in health care

Health care workers are persons with medical education directly providing health care to the population as part of their occupation. Health care workers are educated in medical or dental schools, faculties of pharmacy and biochemistry, other higher education institutions in medicine, as well as in medical high schools.

According to the data from the National Health Care Strategy 2012-2020, "at the end of 2011, there were 73,077 permanently employed persons in the Croatian health care system. Thereof there were 55,781 health care workers and associates, 5,068 administrative workers and 12,228 technical workers. In the structure of permanently employed persons, the largest portion of health care workers has high school degree, amounting to 38 %, while medical doctors make up 17 %. Health care workers with non-university college degree make up 11 %, doctors of dental medicine 4 %, pharmacists 4 %, and health care associates with university degree (psychologists, speech therapists, social workers, defectologists and others) constitute 1 % of the employed. Health care workers with basic school education make up 0.6 % of permanently employed persons, and administrative-technical staff 24 %."

1.2.1. Medical doctors

In 2011, there were 12,532 medical doctors permanently employed in Croatia. The gender distribution in the medical doctor profession has changed in the favour of women since 1989, with female medical doctors currently at 60.6 %. There are 67 % of specialists among medical doctors.

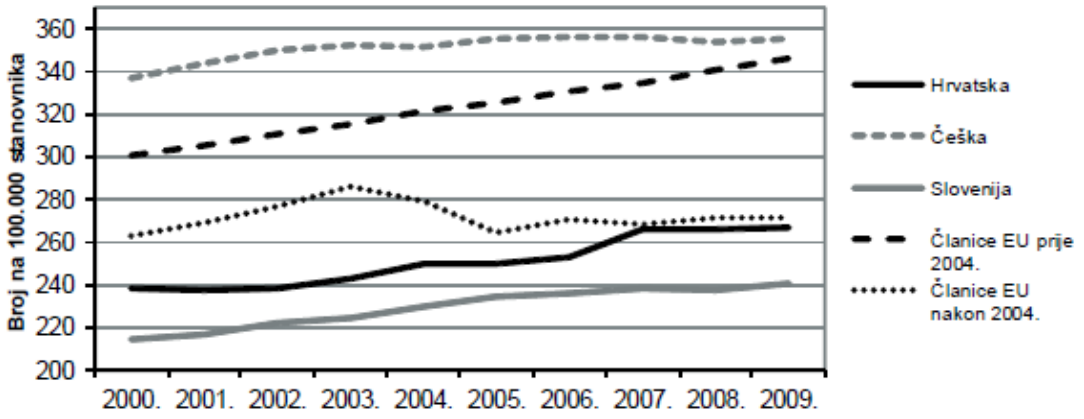

Figure 1. Number of medical doctors per 100,000 inhabitants in Croatia and the EU.
Source: WHO Health for All Database
[OS Y: Number per 100,000 inhabitants;
LEGENDA: Croatia, Czech Republic, Slovenia, EU Member States prior to 2004; EU Member States after 2004]

When looking at the distribution of medical doctors based on the type of health facilities they work in, it turns out that 58 % of medical doctors work in hospitals, which is 2 % higher compared to the situation five years ago. Overall, 26.5 % of medical doctors are employed in community health centres, offices in concession and medical emergency institutions, and 10 % of medical doctors are employed in private offices and facilities.

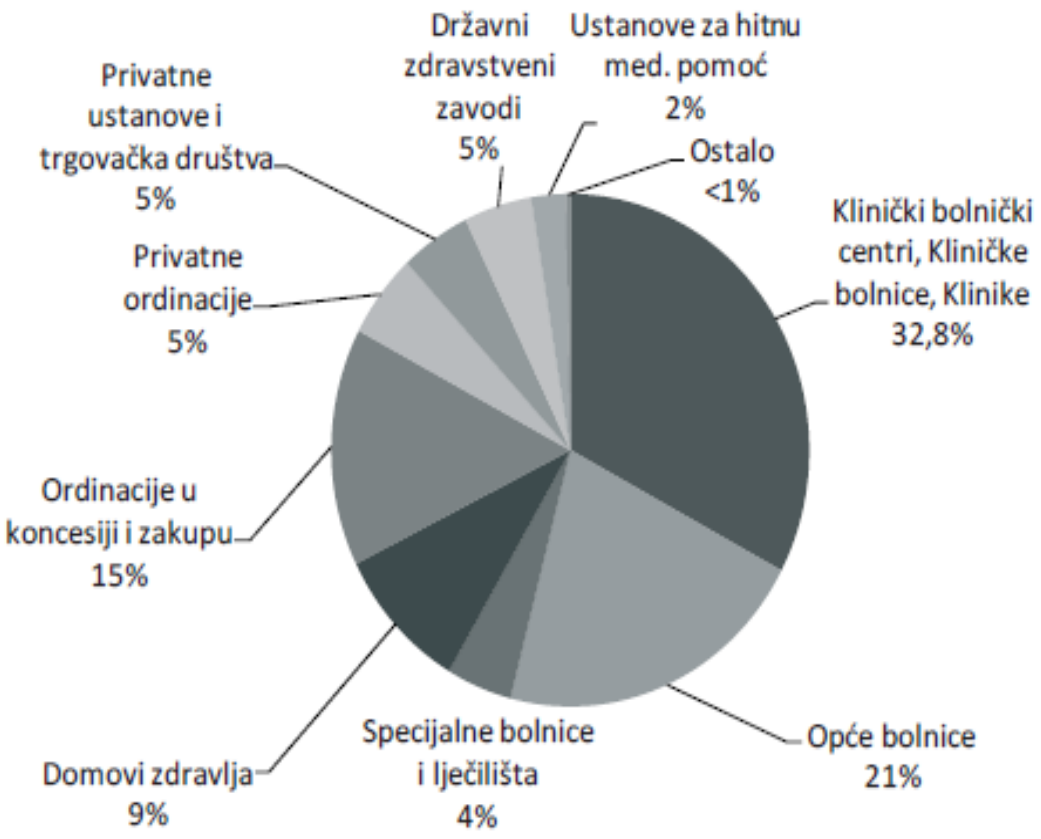

Figure 2. Medical doctors per type of health facilities they work at, 2011.
Source: Croatian Institute of Public Health
[U SMJERU KAZALJKE, POČEVŠI OD "Ustanove za hitnu... 2 %": Medical emergency institutions; Other; University hospital centres, university hospitals, clinics; General hospitals; Special hospitals and spa and health resorts; Community health centres; Offices in concession and lease; Private offices; Private institutions and companies; State-owned health care facilities]

1.2.2. Nurses – medical technicians and midwives

In the total number of health care workers, nurses constitute almost one half of the workforce (46 %). In the group of health care workers with non-university college degree and high school education, which stands at 35,705 employees, nurses and medical technicians constitute 71 %, with the remainder predominantly pertaining to health care engineers and technicians.

The number of nurses per 100,000 inhabitants increased from 354 in 1980 to 569 in 2010, which is almost twice lower than the EU average (782). There are 19 % of nurses with non-university college degree, which is more than in 2006, when their share was 15 %. The number of midwives

per 100,000 inhabitants in Croatia is 35, which is somewhat above the average rate in the EU (32 midwives per 100,000 inhabitants). On average, there were 2.02 nurses employed per one permanently employed doctor in 2011 (the ratio was 2.1 in 2006).

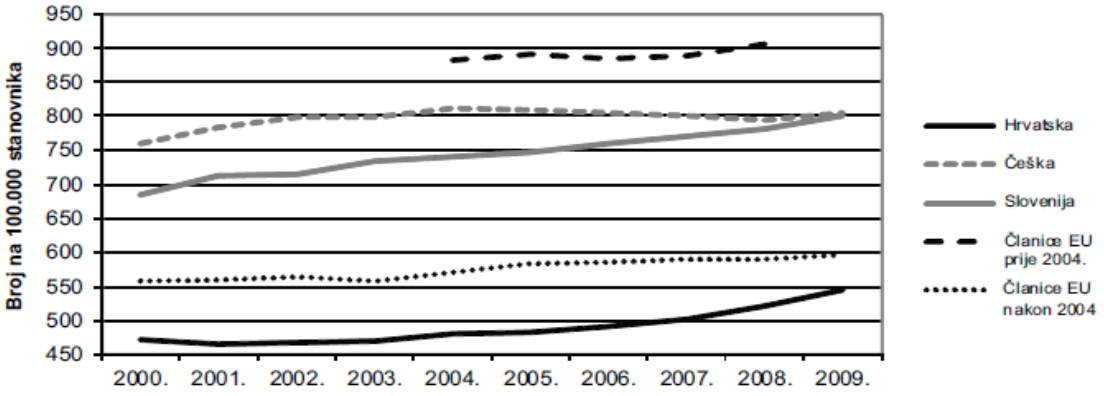

Figure 3. Number of nurses in Croatia and the EU.
Source: WHO Health for All Database
[OS Y: Number per 100,000 inhabitants; LEGENDA: Croatia, Czech Republic, Slovenia, EU Member States prior to 2004; EU Member States after 2004]

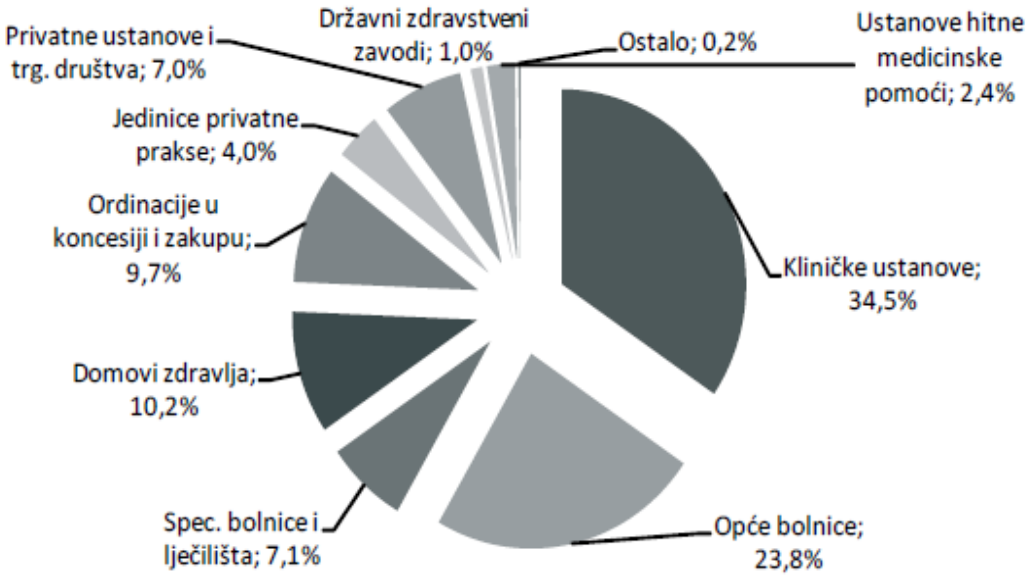

Figure 4. Nurses and medical technicians per type of health facilities they work at, 2011.
Source: Croatian Institute of Public Health
[U SMJERU KAZALJKE, POČEVŠI OD "Ostalo; 0,2 %": Other; University hospital centres, university hospitals, clinics; General hospitals; Special hospitals and spa and health resorts; Community health centres; Offices in concession and lease; Private offices; Private institutions and companies; State-owned health care facilities; Medical emergency institutions]

1.2.3. Health profession of medical laboratory activities, medical radiologic profession, environmental and public health profession, and occupational therapy profession

According to the data of the Croatian Institute of Public Health, published in the Croatian Health Service Yearbook for 2010, there were 1,611 laboratory technicians and 743 laboratory engineers working in medical institutions; 348 laboratory technicians and 101 laboratory engineers working in private offices; 155 laboratory technicians and 98 laboratory engineers working in public health institutes; and 112 laboratory technicians and 16 laboratory engineers working in other institutions – which constitutes the total of 2,226 laboratory technicians (70 %) and 958 laboratory engineers / bachelors of medical and laboratory diagnostics (30 %). In the total number of health care workers with non-university college degree and high school education, standing at 35,705 employees, laboratory technicians and engineers constituted 9 %.

The number of health care workers in the environmental and public health profession was 398, out

of which there were 188 environmental and public health technicians (179 in public and 9 in private health facilities), and 210 environmental and public health engineers (207 in public and 3 in private health facilities).

The number of health care workers in the medical radiologic profession was 1,010, out of which there were 24 radiological technicians (22 in public and 2 in private health facilities), and 986 radiological engineers (981 in public and 5 in private health facilities). The number of health care workers in the occupational therapy profession was 97, out of which there were seven occupational therapy technicians and 89 occupational therapists working in public health facilities, with one occupational therapist working in private practice. Data from the register of the Croatian Chamber of Health Professionals points to a higher number of workers with these profiles – 266 in total – 214 of whom are engaged in occupational therapy. The number of occupational therapy staff per 100,000 inhabitants in Croatia is 4.4, which is below the average of EU member states (33 persons per 100,000 inhabitants). Out of the total number of occupational therapists performing their professional activity, approx. 60 % of these therapists are employed in health facilities, with the remaining 40 % employed in social welfare institutions. At this point in time, occupational therapy is predominantly performed at the secondary level, most frequently in specialized and psychiatric hospitals, while the number of employees with occupational therapy profiles is negligible at the primary level, almost as negligible as at the tertiary level. The data from the Register of Health Care Workers on workers employed in the health care system in the Republic of Croatia for 2013 is provided in Table 3.

Table 2. Employees in the health care system in the Republic of Croatia based on the Register of Health Care Workers in 2011. (Source: Croatian Institute of Public Health)

Status of the health care system in the Republic of Croatia towards the end of 2011	
Permanently employed 73,077 persons, of whom:	55,781 health care workers and associates (76.3 %)
	5,068 administrative (6.9 %) and 12,228 technical workers (16.7 %)
Share of health care workers per educational level:	
High school education: 38 % (27,792)	
Medical doctors: 17 %, (12,532)	
Non-university college degree: 11 % (7,913)	
Doctors of dental medicine: 4 % (3,156)	
Pharmacists: 4 % (2,967)	
University degree (psychologists, speech therapists, social workers, defectologists and others): 1 % (975)	
Basic school education: 0.6 % (398)	
Distribution of medical doctors based on the type of health facilities they are employed in	
In hospitals	58 %
In community health centres, offices in concession and medical emergency institutions	26.5 %
In private offices and institutions	10 %
Medical doctors based on the type of health facilities they were employed in in 2011	
UNIVERSITY HOSPITAL CENTRES, UNIVERSITY HOSPITALS, CLINICS	32.8 %
GENERAL HOSPITALS	21.3 %
OFFICES IN CONCESSION AND LEASE	15 %
COMMUNITY HEALTH CENTRES	9.2 %
PRIVATE OFFICES	5.3 %
PRIVATE INSTITUTIONS AND COMPANIES	4.7 %
STATE-OWNED HEALTH CARE FACILITIES	4.6 %
SPECIAL HOSPITALS AND SPA AND HEALTH RESORTS	4.4 %

MEDICAL EMERGENCY INSTITUTIONS (HMP)	2.3 %
Nurses / medical technicians and midwives	
In the total number of health care workers:	Nurses – almost one half (46 %)
Non-university college degree and high school education (35,705 employees):	Nurses / medical technicians constitute 71 %
Among nurses:	19 % of nurses with non-university college degree
Number of midwives per 100,000 inhabitants in the Republic of Croatia:	35
Ratio of nurses per one permanently employed medical doctor in 2011:	2.02 nurses

Table 3. Employees in the health care system in the Republic of Croatia based on the Register of Health Care Workers in 2013. (Source: Croatian Institute of Public Health)

Status of the health care system in the Republic of Croatia towards the end of 2013	
Permanently employed 74,489 persons, of whom:	57,395 health care workers and associates (77.05 %)
	5,050 administrative (6.8 %) and 12,044 technical workers (16.2 %)
Share of health care workers per educational level:	
High school education: 38 % (27,792)	
Medical doctors: 17 %, (12,946)	
Non-university college degree: 12 % (8,619)	
Doctors of dental medicine: 3 % (3,185)	
Masters of pharmacy: 4 % (2,540)	
Medical biochemists: 0.6 % (442)	
Health care associates with university degree : 0.6 % (436)	
Other health care workers with university degree (psychologists, speech therapists, social workers, defectologists and others): 1 % (744)	
Basic school education: 0.6 % (435)	
Distribution of medical doctors based on the type of health facilities they are employed in	
In hospitals	59 %
In community health centres, offices in concession and medical emergency institutions	26.80 %

In private offices and institutions	10 %
Medical doctors based on the type of health facilities they were employed in in 2013	
UNIVERSITY HOSPITAL CENTRES, UNIVERSITY HOSPITALS, CLINICS	33.30 %
GENERAL HOSPITALS	21.20 %
OFFICES IN CONCESSION AND LEASE	13.40 %
COMMUNITY HEALTH CENTRES	9.30 %
PRIVATE OFFICES	5.00 %
PRIVATE INSTITUTIONS AND COMPANIES	4.70 %
STATE-OWNED HEALTH CARE FACILITIES	4.40 %
SPECIAL HOSPITALS AND SPA AND HEALTH RESORTS	4.60 %
MEDICAL EMERGENCY INSTITUTIONS (HMP)	4.10 %
Nurses / medical technicians and midwives	
In the total number of health care workers:	Nurses – almost one half (46 %)
Share in the total number of employed persons with university degree, non-university college degree and high school education (without the profiles MD, DMD, MPharm) (36,788 employees):	71.80 %
Among nurses:	18.40 % of those with university degree and non-university college degree
Number of midwives per 100,000 inhabitants in the Republic of Croatia:	38
Ratio of nurses per one permanently employed medical doctor in 2013:	2

2. OCCUPATIONAL HEALTH AND SAFETY FOR PERSONS EMPLOYED IN HEALTH CARE – THE CURRENT STATE OF AFFAIRS

Persons employed in health care can be exposed to various risks in the course of their work in health facilities. The key laws governing this area are the *Occupational Health and Safety Act* and the *Health Care Act*. Prevention and treatment of injuries at work and occupational diseases are ensured within compulsory health insurance, which means that employers choose the competent occupational health specialist based on the location of the workplace, and do not pay preventive medical examinations for their workers exposed to elevated health risks at the workplace. The treatment of injuries at work and occupational diseases is part of the scope of work of the elected general

practitioner, while prescribed preventive examinations and the assessment of work capacity are solely under the competence of the occupational health specialist. All employees, in this case persons employed in health care, should know who is their competent occupational health specialist, in order to know where they can look for an advice in regard to occupational health and safety, should such a need occur.

In order to ensure effective implementation of occupational health and safety measures for persons employed in health care, personal protective equipment must also be ensured and used, the purpose of such equipment being, in particular, to protect mucous membrane and skin of health care workers from blood / bodily fluids, and to prevent the contamination of clothes, while at the same time decreasing the possibility of microorganisms spreading from a patient or a contaminated object to other patients or the environment; i.e. the aim is to prevent professional exposure to healthcare-associated infections. One should use protective clothes corresponding to certain standards, and the responsibility for the implementation of protection measures (personal protective equipment and protective activities) lies on health facilities (the management), which must ensure training and availability of personal protective equipment to their employees, but also on the workers themselves, who must be aware of the professional risk they are exposed to, and who must use protective measures in a proper and consistent manner.

In addition, health facilities must have defined protocols for incident situations. Croatia has an established system for the control of healthcare-associated infections, and persons employed in health care, by applying protective measures in their work, are not only guarding their own health, but also having an important role in the prevention and elimination of hospital infections, thus caring for the health and safety of their patients as well.

In addition to the risk of infections, workers in health care can also be exposed to the danger of ionising and non-ionising radiation. In such cases, on top of ensuring general protection measures, it is also important to undertake measures aimed at personal protection and control of personal exposure, and to monitor the medical condition of exposed workers, in order to ensure timely prevention of changes in their medical condition. These persons employed in health care are also subject to compulsory medical examinations, the deadlines and content of which are defined by special ordinances. One prevention measure includes regular servicing of medical equipment and the replacement of parts, because that equipment can be a cause of increased harmful effects on one's health.

In addition to these risks, the staff and patients can be exposed to danger stemming from the harmful effect of cytotoxic drugs - health care workers can be exposed as they prepare and apply the

drugs, and patients when they receive therapy, due to unprofessional handling or preparation of cytotoxic therapy. In most cases, cytotoxic therapy in the Republic of Croatia is prepared in medical departments without the supervision of an expert person (master of pharmacy), which poses danger not only to the person preparing the therapy, but also to patients themselves, and the quality and appropriateness of the prepared drug is questionable as well. It is important to ensure that there is appropriate space and equipment for the reception, storage, preparation, issuance and transport of cytotoxic drugs or therapy. In addition, it is also important to ensure expert preparation of the drugs, by masters of pharmacy and pharmaceutical technicians, as well as appropriate safety measures for the staff, patients and all persons involved in the handling of cytotoxic drugs; proper disposal of bodily fluids of a patient undergoing cytotoxic drug therapy; proper disposal of cytotoxic waste; and defined standard operational procedures to be used in undesirable situations (e.g. spillage of drugs, dripping of the drug in the course of application, breakage of the container, etc.).

Precisely having the elevated health risk in mind, all institutions within the health care system have the duty to prepare the assessment of danger/risk for all tasks, in order to determine the level of danger or risk, as well as measures aimed at occupational health and safety, and at the elimination or removal of danger. By assessing the danger/risk, one can define the tasks that entail elevated risk, and identify those staff members to whom special health and safety measures need to be applied, as well as those workers (persons at work) for whom medical examinations should be compulsory in a defined timeframe. The assessment of danger/risk is a dynamic process, and an assessment made once must be revised every two years, in particular if an aggravated, multiple or mortal injury at work or occupational disease occurred in the meantime.

The following persons or entities are in charge of care for occupational health and safety in individual health facilities:

- Occupational health and safety specialist;

- Occupational health and safety service;

- Occupational health and safety committee;

- Authorized officers for occupational health and safety;

- Commissioners for occupational health and safety;

- Works council.

The following activities are undertaken with the aim of protecting occupational health and safety:

- All employees are trained to work in a safe manner, and they are sent to examinations for jobs that

entail special working conditions (e.g. staff in the radiation zone; obligatory dosimetry control; medical examinations; issuance of certificates of capacity; staff members subject to preliminary or periodic vocational training for work in the radiation zone are sent to training).

- Environmental and public health examinations – environmental and public health cards – annual controls by the institute of public health.
- Evacuation and rescue constitute an obligation prescribed by the Occupational Health and Safety Act, and drills are undertaken at least once every two years.
- Annual education and verification of knowledge in connection with cardiopulmonary resuscitation.
- Continuous education in connection with regulations pertaining to individual health care worker profiles (in accordance with the requirements of individual expert Chambers – on the basis of which annual Education Plans are reached and submitted to the Chambers).
- Monitoring, supervision and reporting on percutaneous incidents / injuries by sharp objects.
- Education of staff members in connection with working with various forms of medical and other waste; proper disposal until the moment of transport by authorized collector; records regarding the forms on waste flow (ONTO forms); waste management plans.
- Attaching due importance to the safety of operation of certain devices – compulsory education of staff members prior to putting a new piece of equipment into operation; maintaining special records in the form of "Device Lists" for every device, its servicing and calibration, etc.
- Annual plan determined by internal supervision is used to undertake periodic or, based on need, unannounced verification of the implementation of defined procedures.
- Internal audits per activities and branches; periodic audits and recertification audits by authorized (certification) authority, the Agency for Quality and Accreditation in Health Care and Social Welfare.

2.1. Supervision of the health status and causes of sick leave

According to European and Croatian standards, the employer bears the responsibility for the safety and protection of health in the process of employees performing their tasks at the workplace. The duty of the employer is to ensure a *healthy workplace*, i.e. a workplace free of harm to the health of a worker. To that effect, the employer has the duty to prepare a risk assessment determining the risk of damage to health at an given workplace, and the risk present in case of exposure to an individual harm or a group of harms. In Croatia, this obligation, and the implementation of steps in connection with it, are based on the *Ordinance on the Preparation of a Risk Assessment* (Official Gazette no.

112/14). According to the ILO Convention on Occupational Health Services (Convention C-161), occupational health services, in addition to their other functions in a company, also have a function pertaining to the identification and assessment of the risk of harm to the health of persons at the workplace, which is why these services must act accordingly and regularly examine the working conditions that may harm the health of workers as they visit the workplaces.

In jobs that entail elevated risks, it is important to continuously monitor the health of workers, given the higher level of danger when it comes to the development of work-related diseases (including occupational diseases) and injuries at work. The *Ordinance on Jobs with Special Working Conditions* of 1984 (Official Gazette no. 5/84), currently in force in Croatia, covers quite a high number of jobs in which workers are exposed to individual harms that pose danger to health. The Ordinance prescribes the supervision of the health status of workers employed in jobs which involve risks, harms and exertions that may jeopardize their life and health, as well as the life and health of other persons. At the same time, in accordance with international regulations and European guidelines, Ordinances determining the method of health protection and surveillance of the health status of persons exposed to individual harms (ionising and non-ionising radiation; chemical and biological harms; mutagenic and carcinogenic factors; physical harms; work with display screens; work of maritime personnel and aircraft personnel) are either reached or are in preparation. The Croatian Institute for Protection of Health and Safety at Work, the Croatian Institute of Public Health and the Croatian Health Insurance Fund (in the area pertaining to temporary incapacity for work) are engaged in the monitoring of indicators regarding the quality of the protection of health of workers in the sphere of specific health care: these include the number of examined workers; persons employed in jobs with special working conditions; number of workers examined in accordance with specific regulations; data on the morbidity of workers exposed to individual harms, including the frequency of diseases of individual systems and the work capacity determined in individual examinations.

2.1.1. Medical examinations of persons exposed to ionising radiation and cytotoxic substances

Medical examinations of exposed workers, exposed apprentices, pupils and students being trained for work with ionising radiation sources, are conducted based on the Ordinance on Medical Requirements for Exposed Workers and Apprentices and Students Undergoing Training or Education for Work with Ionising Radiation Sources (Official Gazette no. 80/13). In the course of 2012, there were 3,590 examinations of persons exposed to ionising radiation. When it comes to medical examinations for work in the area of exposure to radiation, out of the total of 3,590 workers there

were 1,697 males (47.3 %) and 1,893 females (52.7 %). Most of the workers active in areas of exposure to radiation were employed in health care (2,875 persons; 80.1 %): medical doctors, doctors of dental medicine, nurses, engineers and technicians, and other profiles. Due to the risk of damage to health, workers in the health care service handling cytostatic substances are subject to the provisions of the *Order on the Method of Handling Medications Containing Cytotoxic Substances* (Official Gazette no. 30/91) and the *Ordinance on the Protection of Workers from Risks Related to Exposure to Carcinogens and/or Mutagens* (Official Gazette no. 40/07). According to the obtained data, cytostatics are applied in 21 health facilities in the Republic of Croatia, and there are 716 workers handling these substances. The majority of workers handling cytostatics have high school education (475 persons; 66 %), followed by workers with non-university college degree (124 persons; 17 %), those with university education (76 persons; 11 %), and unskilled workers (41 persons; 6 %). In the work process, workers come in contact with cytostatics in the following ways: in the process of transport (transport of cytostatics from the central pharmacy to the department); reception; preparation; application; disposal of cytostatics; handling bodily fluids contaminated by decomposition products. Most workers are in contact with less than 100 preparations per month, and the mode of contact is a combination of skin contact and inhalation.

Only 346 workers (57 %) underwent preliminary and periodic examinations; 71 workers (12 %) were subject to preliminary examinations, but not regular periodic examinations. There are 52 workers (9 %) who were not subjected to a preliminary examination, but are regularly subjected to periodic examinations, while 135 workers (22 %) did not go through either preliminary or periodic examinations. Given the need for effective protection of the health of workers, various procedures used in these types of jobs, and the complexity of implementation of various general and specific occupational health and safety rules, it is necessary to ensure that the Republic of Croatia reaches the regulations that would govern the area of work with cytostatics and prescribe protective equipment and procedures applied for the purpose of health protection. In addition to that, it is necessary to prescribe the content of the educational programme for individual groups of workers, together with the obligation of performing preventive examinations and the deadlines and content of such examinations.

2.1.2. Causes and costs of sick leave

Reporting data for 2011, 2012 and 2013 from the Croatian Health Insurance Fund on sick leave rates, causes of sick leave according to the International Classification of Diseases ICD-10 (diseases; injuries

at work; occupational diseases), and on paid health care costs in relation to the total working population, are provided in Tables 4 to 10.

Table 4. Sick leave causes for the total working population in the Republic of Croatia in 2011

DISEASES ACCORDING TO ICD-10 (A00-O99) for the total working population of the Republic of Croatia				
	Cases / number	%	Costs/HRK	%
Diseases (A0) - ICD A00-O99	39,747	60.60	503,434,491.79	63.85
Injuries at work (B0)	14,862	22.66	182,266,385.55	23.12
Occupational diseases (C0)	158	0.24	2,042,100.91	0.26
Other (injuries in transport; poisonings; etc.) A0 ICD P00-Z99	10,819	16.50	100,723,361.67	12.77
Total	65,586	100	788,466,339.92	100

Table 5. Sick leave causes in health care in the Republic of Croatia in 2011

DISEASES ACCORDING TO ICD-10 (A00-O99) in health care				
	Cases / number	%	Costs/HRK	%
Diseases (A0) - ICD A00-O99	3,343	64.90	34,967,038.00	61.18
Injuries at work (B0)	1,134	22.02	15,701,872.16	27.47
Occupational diseases (C0)	38	0.74	737,962.47	1.29
Other (injuries in transport; poisonings; etc.) A0 ICD P00-Z99	636	12.35	5,744,302.99	10.05
Total	5,151	100	57,151,175.62	100

Table 6. Sick leave causes for the total working population in the Republic of Croatia in 2012

DISEASES ACCORDING TO ICD-10 (A00-O99) for the total working population of the Republic of Croatia				
	Cases / number	%	Costs/HRK	%
Diseases (A0) - ICD A00-O99	36,702	61.04	475,658,773.40	64.38
Injuries at work (B0)	13,053	21.71	165,898,079.53	22.45
Occupational diseases (C0)	137	0.23	1,901,704.17	0.26

Other (injuries in transport; poisonings; etc.) A0 ICD P00-Z99	10,237	17.03	95,357,075.41	12.91
Total	60,129	100	738,815,632.51	100

Table 7. Sick leave causes in health care in the Republic of Croatia in 2012

DISEASES ACCORDING TO ICD-10 (A00-O99) in health care				
	Cases / number	%	Costs/HRK	%
Diseases (A0) - ICD A00-O99	3,305	65.05	34,744,157.92	61.90
Injuries at work (B0)	1,061	20.88	14,941,046.10	26.62
Occupational diseases (C0)	27	0.53	611,372.00	1.09
Other (injuries in transport; poisonings; etc.) A0 ICD P00-Z99	688	13.54	5,834,204.49	10.39
Total	5,081	100	56,130,780.51	100

Table 8. Sick leave days per occupation for health care in the Republic of Croatia in 2011

DANI BOLOVANJA PREMA ZANIMANJU												
	Doktori (medicine i dentalne)		Medicinske sestre i tehničari/ troškovi		Medicinsko- laboratorijska djelatnost/ troškovi		Radiološko tehnološka djelatnosti/ troškovi		Sanitarni inženjeri/ troškovi		Fizioterapeuti/ troškovi	
	dani bolovanja	trošak	dani bolovanja	trošak	dani bolovanja	trošak	dani bolovanja	trošak	dani bolovanja	trošak	dani bolovanja	trošak
Bolesti (A0) - MKB A00-O99	17.504	3.085.522,54	81.057	14.014.799,10	121	23.043,32	2.011	377.201,64	4	810,91	6.259	1.025.830,30
Ozljede na radu (B0)	5.187	2.553.096,18	24.348	6.683.312,53	206	115.435,46	623	210.801,60	49	18.235,80	917	236.516,42
Profesionalne bolesti (C0)	493	291.401,77	617	180.864,96	0	0,00	20	5.171,20	0	0,00	229	53.909,15
Ostalo (ozljede u prometu, trovanja i dr) A0 MKB P00-Z99	3.207	577.804,06	12.024	2.159.599,23	0	0,00	503	93.328,56	0	0,00	1.297	215.004,78

SICK LEAVE DAYS PER OCCUPATION												
	Medical doctors and doctors of dental medicine		Nurses and technicians / costs		Medical and laboratory activity / costs		Radiological and technological activity / costs		Environmental and public health engineers / costs		Physiotherapists / costs	
	Sick leave days	Cost	Sick leave days	Cost	Sick leave days	Cost	Sick leave days	Cost	Sick leave days	Cost	Sick leave days	Cost
Diseases (A0) - ICD A00-O99	17,504	3,085,522.54	81,057	14,014,799.10	121	23,043.32	2,011	377,201.64	4	810.91	6,259	1,025,830.30
Injuries at work (B0)	5,187	2,553,096.18	24,348	6,683,312.53	206	115,435.46	623	210,801.60	49	18,235.80	917	236,516.42
Occupational diseases (C0)	493	291,401.77	617	180,864.96	0	0.00	20	5,171.20	0	0.00	229	53,909.15
Other (injuries in transport; poisonings; etc.) A0 ICD P00-Z99	3,207	577,804.06	12,024	2,159,599.23	0	0.00	503	93,328.56	0	0.00	1,297	215,004.78

Table 9. Sick leave days per occupation for health care in the Republic of Croatia in 2012

DANI BOLOVANJA PREMA ZANIMANJU												
	Doktori (medicine i dentalne)		Medicinske sestre i tehničari/ troškovi		Medicinsko-laboratorijska djelatnost/ troškovi		Radiološko tehnološka djelatnosti/ troškovi		Sanitarni inženjeri/ troškovi		Fizioterapeuti/ troškovi	
	dani bolovanja	trošak	dani bolovanja	trošak	dani bolovanja	trošak	dani bolovanja	trošak	dani bolovanja	trošak	dani bolovanja	trošak
Bolesti (A0) - MKB A00-O99	17.563	3.057.789,10	81.035	14.003.495,80	104	19.260,09	1.864	353.159,65	105	20.669,40	5.178	844.568,47
Ozljede na radu (B0)	5.646	2.726.635,71	21.399	6.023.061,13	94	42.210,80	670	228.256,92	125	47.600,00	893	214.162,10
Profesionalne bolesti (C0)	296	177.833,86	967	274.425,12	0	0,00	15	4.067,20	0	0,00	64	16.108,40
Ostalo (ozljede u prometu, trovanja i dr) A0 MKB P00-Z99	2.505	459.362,18	13.632	2.434.633,37	35	6.957,24	856	148.836,73	0	0,00	1.366	233.834,60

SICK LEAVE DAYS PER OCCUPATION												
	Medical doctors and doctors of dental medicine		Nurses and technicians / costs		Medical and laboratory activity / costs		Radiological and technological activity / costs		Environmental and public health engineers / costs		Physiotherapists / costs	
	Sick leave days	Cost	Sick leave days	Cost	Sick leave days	Cost	Sick leave days	Cost	Sick leave days	Cost	Sick leave days	Cost
Diseases (A0) - ICD	17,563	3,057,789.10	81,035	14,003,495.80	104	19,260.09	1,864	353,159.65	105	20,669.40	5,178	844,568.47

A00-O99												
Injuries at work (B0)	5,646	2,726,635.71	21,399	6,023,061.13	94	42,210.80	670	228,256.92	125	47,600.00	893	214,162.10
Occupational diseases (C0)	296	177,833.86	967	274,425.12	0	0.00	15	4,067.20	0	0.00	64	16,108.40
Other (injuries in transport; poisonings; etc.) A0 ICD P00-Z99	2,505	459,362.18	13,632	2,434,633.37	35	6,957.24	856	148,836.73	0	0.00	1,366	233,834.60

Tablica 10. Dani bolovanja prema zanimanjima u 2013. godini u djelatnosti zdravstvene zaštite u Republici Hrvatskoj												
	Doktori (medicine i dentalne)		Medicinske sestre i tehničari/ troškovi		Medicinsko-laboratorijska		Radiološko tehnološka djelatnosti/ troškovi		Sanitarni inženjeri/ troškovi		Fizioterapeuti/ troškovi	
	dani bolovanja	trošak	dani bolovanja	trošak	dani bolovanja	trošak	dani bolovanja	trošak	dani bolovanja	trošak	dani bolovanja	trošak
Bolesti (A0) - MKB A00-O99	16,445	2.837.540,16	78,516	13.577.238,71	445	87.184,04	2,005	362.604,36	182	35.337,10	6,065	1.021.155,91
Ozljede na radu (B0)	5,449	2.837.185,68	21,401	5.913.923,70	130	55.092,32	873	271.134,94	16	4.439,04	2,084	489.060,90
Profesionalne bolesti (C0)	230	134.587,32	785	229.523,06	0	0	32	9.310,72	0	0	133	34.668,96
Ostalo (ozljede u prometu, trovanja i dr) A0 MKB P00-Z99	3,087	570.980,28	15,394	2.745.880,70	397	63.408,79	417	80.216,54	0	0	1,28	203.379,43

Table 10. Sick leave days per occupation for health care in the Republic of Croatia in 2013

	Medical doctors and doctors of dental medicine	Nurses and technicians / costs	Medical and laboratory activity / costs	Radiological and technological activity / costs	Environmental and public health engineers / costs	Physiotherapists / costs

	Sick leave days	Cost	Sick leave days	Cost	Sick leave days	Cost	Sick leave days	Cost	Sick leave days	Cost	Sick leave days	Cost
Diseases (A0) - ICD A00-O99	16,445	2,837,540.16	78,516	13,577,238.71	445	87,184.04	2,005	362,604.36	182	35,337.10	6,065	1,021,155.91
Injuries at work (B0)	5,449	2,837,185.68	21,401	5,913,923.70	130	55,092.32	873	271,134.94	16	4,439.04	2,084	489,060.90
Occupational diseases (C0)	230	134,587.32	785	229,523.06	0	0	32	9,310.72	0	0	133	34,668.96
Other (injuries in transport; poisonings; etc.) A0 ICD P00-Z99	3,087	570,980.28	15,394	2,745,880.70	397	63,408.79	417	80,216.54	0	0	1.28	203,379.43

2.2. Occupational diseases and injuries at work

The number of examinations of workers in health care is almost negligible, even though this group of employees belongs to the branches of the economy with the highest number of persons facing disease due to workplace impact, according to the European standards and our data. According to the National Health Care Strategy 2012-2020, health care belongs to high-risk economic activities, and it is above the average rates in Croatia when it comes to occupational diseases and injuries at work, with the rates of 7.5/100,000 and 904.4/100,000 respectively.

The Register of Occupational Diseases is set up and being maintained at the Croatian Institute for Protection of Health and Safety at Work, which is an activity that the Institute is continuously performing for the purposes of the Ministry of Health. Recognized occupational diseases are being monitored within the Register at the state level, thus providing the basis for preventive actions in the sphere of protection of health of the economically active population. The analyses include the causes of diseases; characteristics of persons who have gotten sick (age, gender, years of service, educational attainment); economic activities and occupations as causes of occupational diseases; harmful conditions and types of harm that cause occupational diseases.

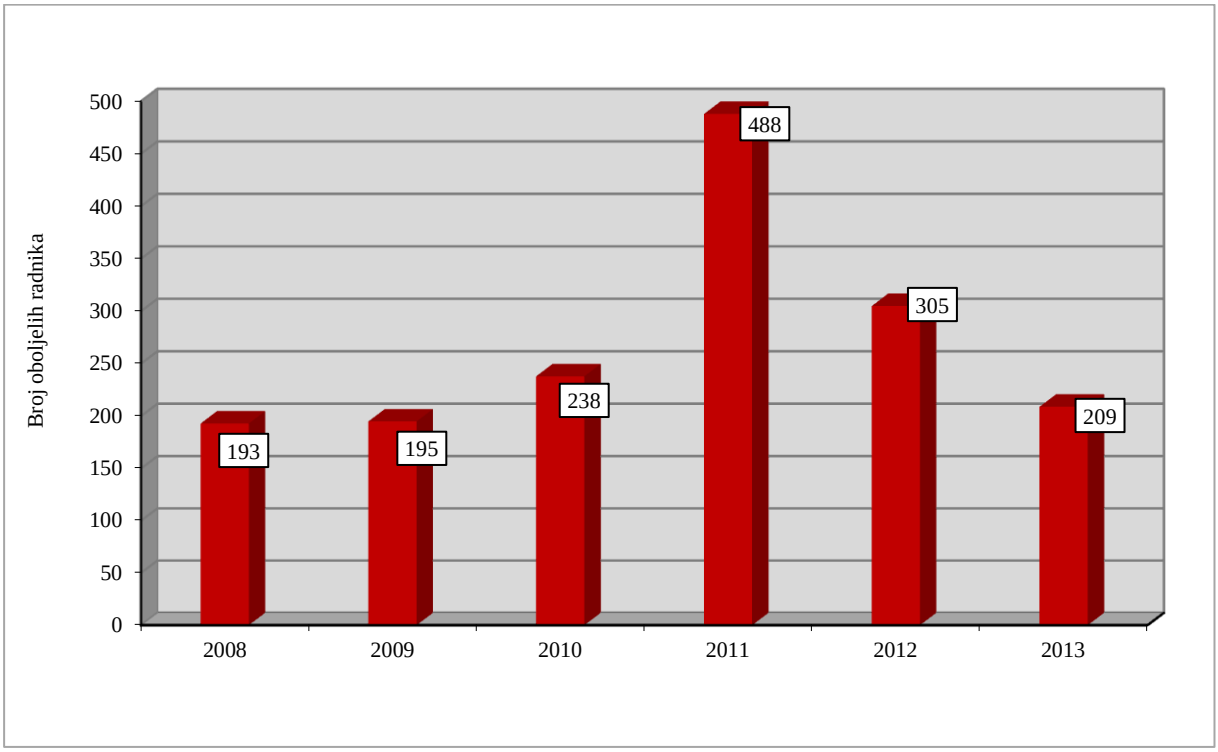

Figure 5. Number of occupational diseases in the Republic in Croatia in the past six years. Source: Croatian Institute for Protection of Health and Safety at Work

[OS Y: Number of workers fallen ill]

As is clear from Figure 5, there is a mildly rising trend in terms of the number of recognized occupational diseases until 2011, followed by a subsequent drop. The economic activity of health care and social welfare is in fourth place when it comes to occupational diseases and injuries at work. In 2010, the rates of occupational diseases per 100,000 employees across economic activities were in the range between 1.23 and 63.41 per 100,000 employees, and the average rate stood at 15.88/100,000. In the economic activity of health care and social welfare, the occupational disease rate is somewhat lower than the average rate, and stands at 12.86/100,000. Out of the total of 238 recognized occupational diseases in 2010, twelve (12) diseases were present in health care. These diseases were predominantly contagious diseases (10/12), recorded among health care workers and assistance staff, and merely two occupational diseases connected with the overuse syndrome, recorded in case of hospital office staff.

In 2011, out of the total of 488 recognized occupational diseases, 15 occupational diseases were present in health care: contagious diseases (12/15); various forms of allergic dermatitis (2/15); asthma (1/15). Occupational disease rate in health care stood at 18.5/100,000 in 2011 (Figure 6).

In 2012, out of the total of 305 recognized occupational diseases, 14 occupational diseases were present in health care: contagious diseases (11/14); overuse syndrome (2/14); neoplasm (1/14). Occupational disease rate in health care stood at 14.7/100,000 in 2012 (Figure 6).

In 2013, out of the total of 209 recognized occupational diseases, 10 occupational diseases were present in health care: contagious diseases (7/10); neoplasm (1/10); overuse syndrome (1/10); asthma (1/10). The diagnosed workers included medical doctors, nurses, engineers, technicians, cleaning personnel and administrative staff (Figure 7). Occupational disease rate in health care stood at 11.8/100,000 in 2013 (Figure 6).

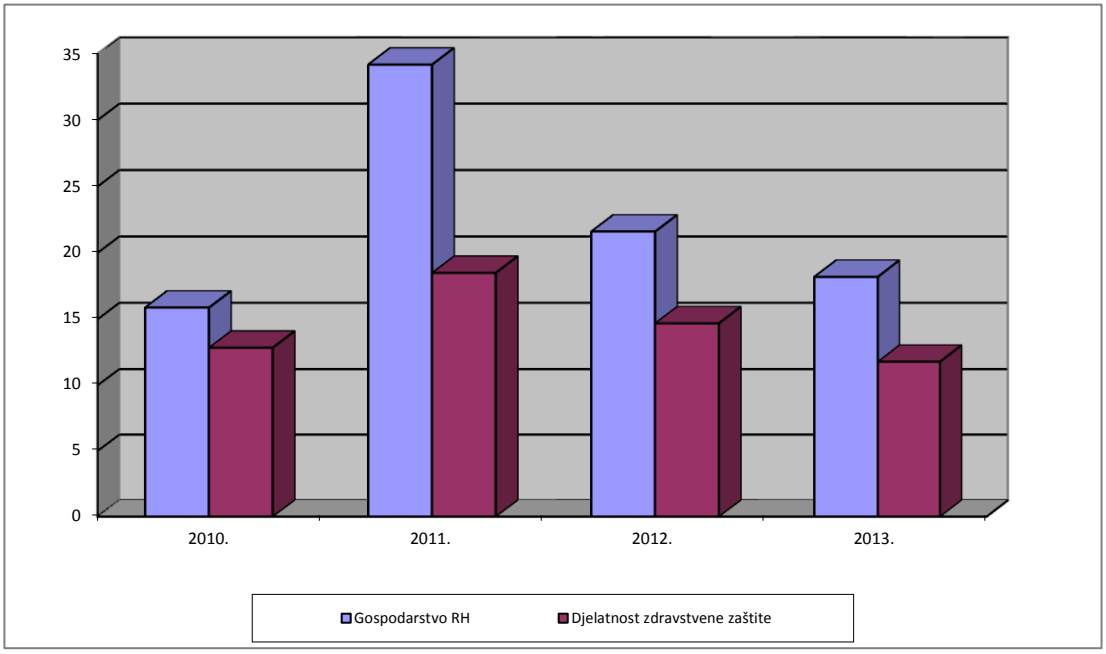

Figure 6. Number of recognized occupational diseases per 100,000 employees in health care in the period from 2010 to 2013. Source: Croatian Institute for Protection of Health and Safety at Work [Economy of the Republic of Croatia; Health care]

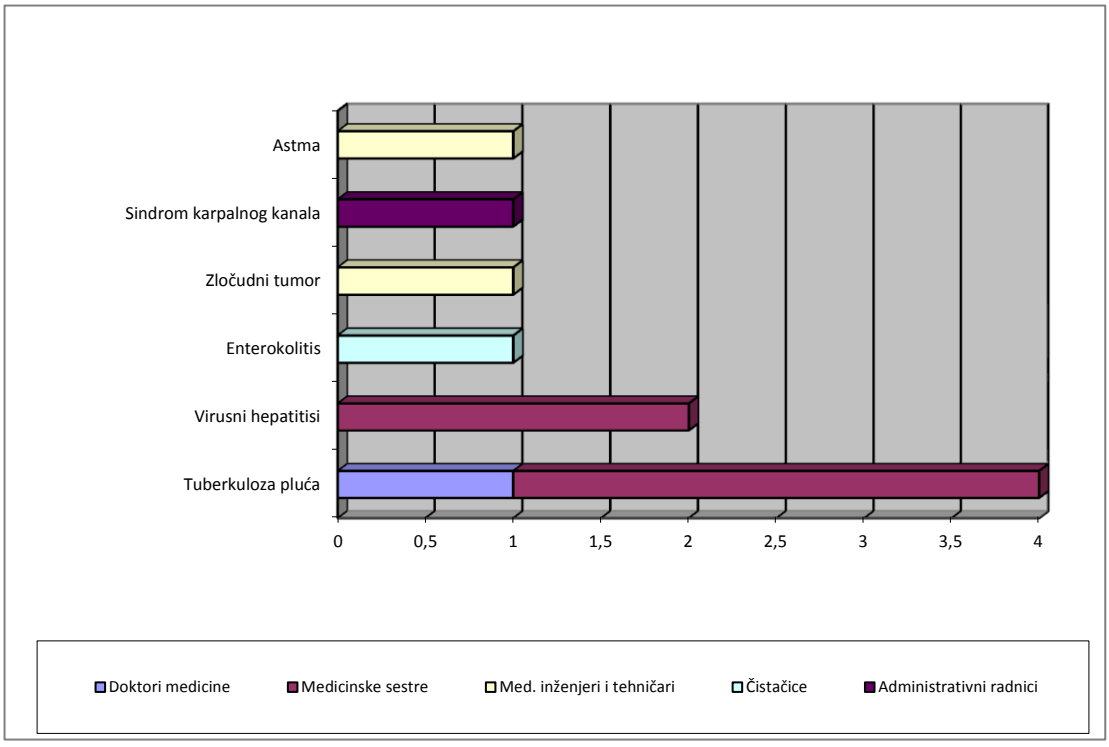

Figure 7. Recognized occupational diseases in health care in 2013 per diagnosis and occupation. Source: Croatian Institute for Protection of Health and Safety at Work
[Asthma; Carpal tunnel syndrome; Malignant tumor; Enterocolitis; Viral hepatitis; Pulmonary tuberculosis;
LEGENDA SLIJEVA NADESNO: Medical doctors; Nurses; Medical engineers and technicians; Cleaning personnel; Administrative workers]

In terms of the number of injuries at work, the economic activity of health care and social welfare is in fourth place. In 2011, the Croatian Health Insurance Fund recognized 13,817 injuries at work. Out of that number, 1.236 injuries at work were recorded in health care and social welfare (8.95 %). Out of the total of injured workers, 816 workers (66.01 %) were injured at the workplace, and 420 workers (33.98 %) were injured on the way to work or from work (Tables 4 and 7).

In 2012, there were 14,076 injuries at work, 1,307 of which in health care and social welfare (9.29 %). Of these, 794 injuries took place at the workplace (60 %), and 513 on the way to work or from work (40 %) (Tables 6 and 8).

Of the total number of injuries at work in 2013, there were 11,252 injuries (81.56 %) at the workplace, and 2,544 injuries (18.44 %) on the way to or from work. As many as 57 workers in health care faced injuries at the workplace in 2013. What is worrying is that the rate of injuries during arrival to or departure from work is highest precisely in this economic activity, which may be caused by excessive staff fatigue, which is why due attention must be paid to this issue in the future. Health care is the third economic activity in the Republic of Croatia in terms of the rates of injured workers.

According to the *Annual Report on Prevention and Suppression of Hospital Infections in Hospitals in the Republic of Croatia in 2011,* prepared by the Reference Centre for Hospital Infections of the Ministry of Health of the Republic of Croatia, 887 injuries suffered by employees in hospitals occurred as percutaneous incidents (UI), due to contact with a foreign body or object that penetrated the skin ("sharp injuries" according to the Directive 2010/32/EU). What is unexpected is that only 32 such injuries (3.6 %) were recognized as injuries at work (Table 9).

Table 9. Recognized injuries at work due to percutaneous incidents in 2010 and 2011

	Recognized injuries at work in the database of the Croatian Institute for Protection of Health and Safety at Work	Percutaneous incidents recognized as injuries at work (# and %) in the Republic of Croatia	Percutaneous incidents recognized as injuries at work (#) City of Zagreb	Annual report (#)	Percutaneous incidents in the Republic of Croatia recognized as injuries at work

					according to the Annual Report (%)
2010	17000	32 (0.2 %)	5	887	3.6 %
2011	14000	58 (0.4 %)	4	884	6.5 %

Legend:
UI – Percutaneous incidents – injuries occurring as a result of contact with a foreign body or object that penetrated the skin
ONR – Injury at work (Source: Database of the Croatian Institute for Protection of Health and Safety at Work)
Annual Report – Annual Report on Prevention and Suppression of Hospital Infections in Hospitals in the Republic of Croatia

In July 2013, the Ordinance on the Method of Implementation of Protection Measures for the Purposes of Prevention of Sharp Injuries entered into force, transposing the Council Directive 2010/32/EU into the legal framework of the Republic of Croatia. In accordance with Article 9 of the Ordinance, the employer has the duty to inform the Croatian Institute for Protection of Health and Safety at Work, as well as the relevant insurer, on every occurrence of sharp injury. For every injury, the employer needs to fill out the forms provided in Appendix I and Appendix II of the Ordinance that form its constituent parts. The Appendix I form is delivered to the Croatian Institute for Protection of Health and Safety at Work, while the Appendix II form is retained by the employer for the purposes of maintaining own records. The Croatian Institute for Protection of Health and Safety at Work maintains the records of received reports on sharp injuries, and the data is processed on a monthly basis. In August 2013, the Croatian Institute for Protection of Health and Safety at Work started receiving the initial reports in line with the Ordinance, and 76 filled out Forms for the reporting of sharp injuries and exposure to blood were received in total in the period from August 2013 till the end of that year.

Over a period of one decade, records on percutaneous incidents have been maintained in individual health facilities based on the recognized needs and the provisions of the *Ordinance on the Conditions and Method of Implementation of Measures for the Prevention and Suppression of Hospital Infections.* One positive example of awareness raising regarding the necessity to report all percutaneous incidents, coming from the Clinic for Traumatology of the University Hospital Centre "Sestre milosrdnice" in Zagreb, is elaborated in Figures 8 and 9.

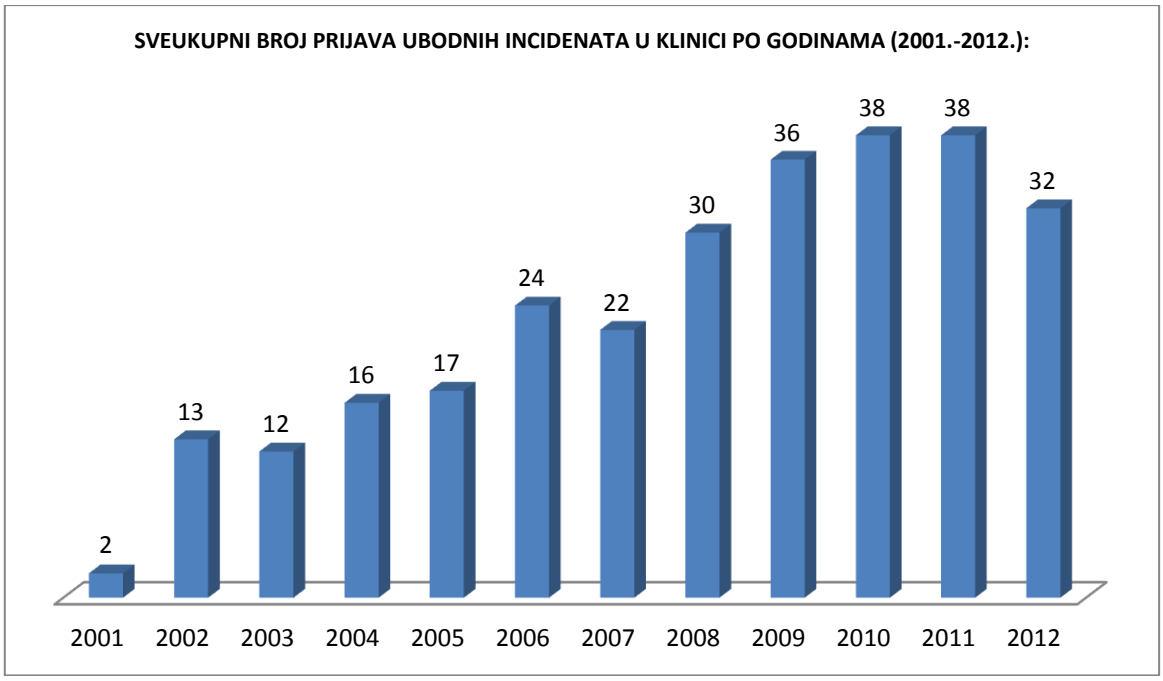

Figure 8. Reporting on percutaneous incidents in the period 2001-2012 – Clinic for Traumatology, University Hospital Centre "Sestre milosrdnice", Zagreb. Source: Clinic for Traumatology

[Total number of percutaneous incident reports in the Clinic per year (2001-2012)]

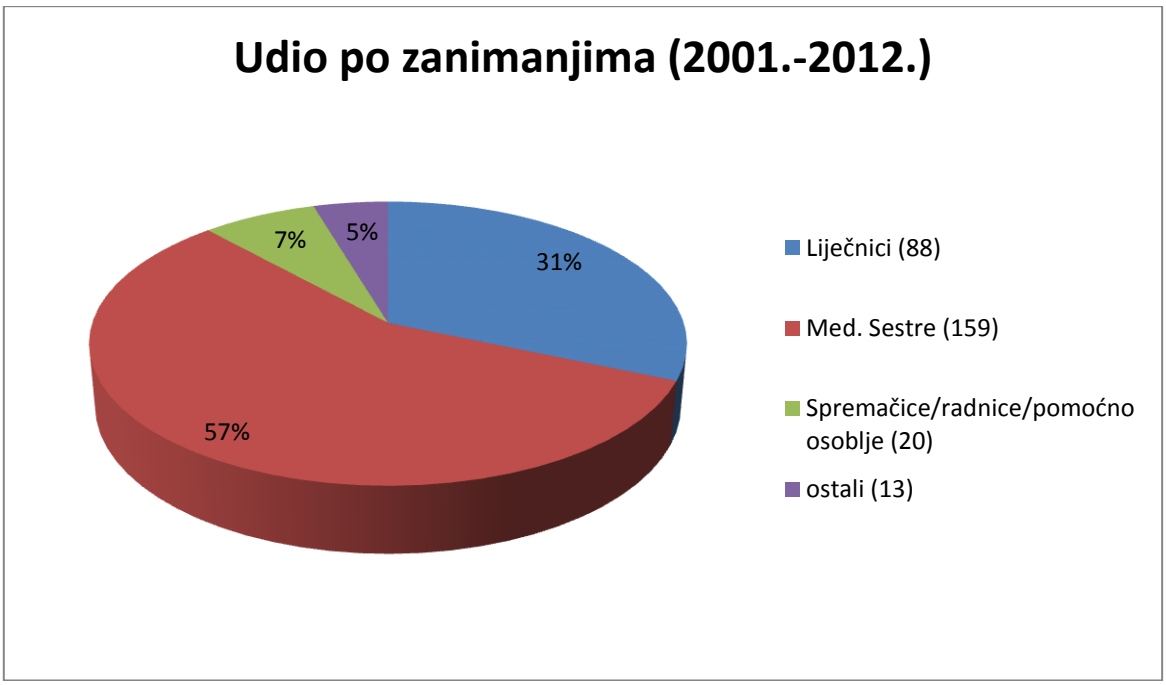

Figure 9. Reporting on percutaneous incidents per occupation in the Clinic for Traumatology, University Hospital Centre "Sestre milosrdnice", Zagreb, in the period 2001-2012. Source: Clinic for Traumatology

[Share per occupation (2001-2012)
Medical doctors; Nurses; Cleaning personnel / workers / assistant staff; Other]

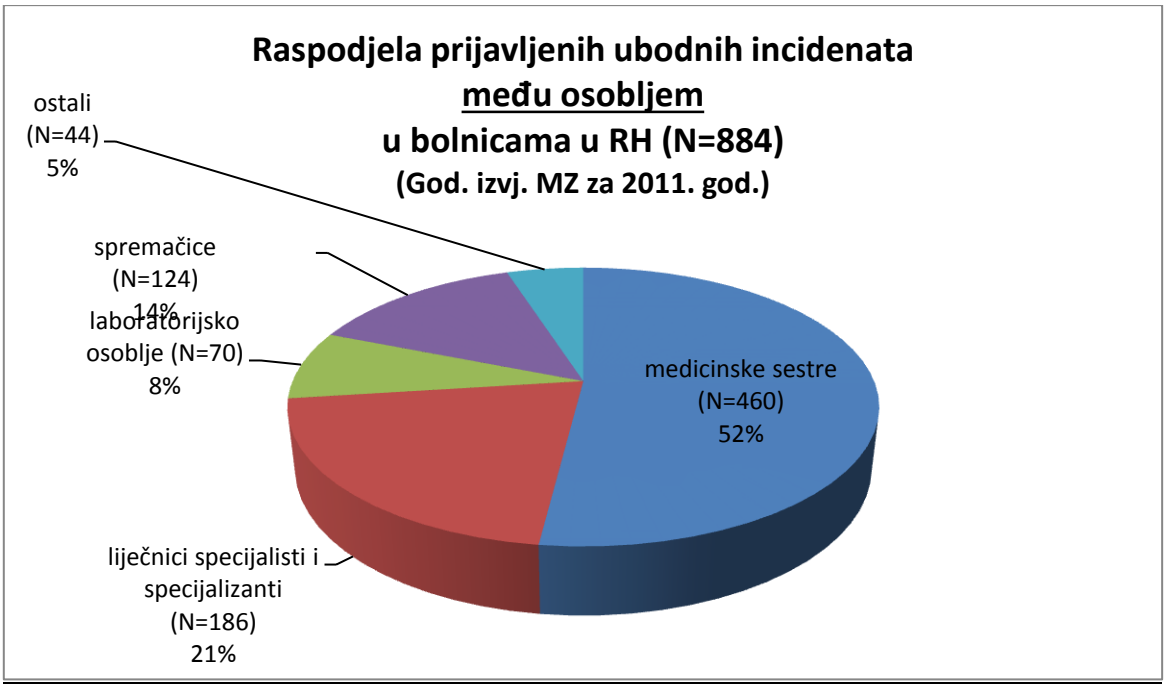

Figure 10. Reported percutaneous incidents per occupation in hospitals of the Republic of Croatia in 2011. Source: Annual Report on Prevention and Suppression of Hospital Infections in Hospitals in the Republic of Croatia in 2011 by the Reference Centre for Hospital Infections of the Ministry of Health of the Republic of Croatia. Contact: dr. Rok Čivljak, MD, University Hospital for Infectious Diseases „Dr. Fran Mihaljević“, Zagreb.

[Distribution of reported percutaneous incidents among staff in hospitals in the Republic of Croatia (N=884); (Annual Report of the Ministry of Health for 2011); LEGENDA POČEVŠI OD "ostali...5 %": Other, Nurses; Specialist doctors and residents; Laboratory staff; Cleaning personnel]

2.3. *Insurance against the risk of injuries at work, occupational diseases and work-related diseases*

Prevention and treatment of injuries at work and professional diseases are covered by compulsory health insurance, with the employers paying contributions for that purpose in the amount of 0.5 % of the gross salary amount. Employers choose the competent occupational health specialist based on the location of the workplace, with no direct payments for the preventive examinations of their workers exposed to elevated health risks at the workplace.

Prevention and treatment of work-related diseases are not covered by this special contribution; instead, they are paid from the funds of the general health insurance.

2.4. Education

In schools, polytechnic educational institutions and faculties where pupils and students are being trained for work in health care, there are no compulsory programmes for safety at work. Pupils and students are being acquainted with the principles of safety at work as part of compulsory exercises and practical teaching programmes, but not under the specific headline of safety at work. Examples include the Medical School Osijek, where pupils are being acquainted with the basics of safety at work; expert studies in Medical Laboratory Diagnostics at the University of Rijeka include a course on "Safety at work for health care workers"; and the curriculum of the Nursing Studies at the School of Medicine of the University of Zagreb includes an optional course on "Health and safety at work and occupational diseases".

The Vocational Education and Training Act (Official Gazette no. 30/09, 24/10) insufficiently defines the duties of the employer concluding a contract (Article 27) and the duties of students attending practical work and exercises at the employer's premises (Article 28), while the Ordinance on the Method of Organization and Conduct of Teaching in Vocational Schools (Official Gazette no. 140/09) stipulates the following in Article 5:

1. Prior to the beginning and implementation of the practical part of the curriculum, students must become acquainted with the foundations of occupational health and safety as prescribed by the vocational education and training curriculum, and they must pass the test before a competent person from the institution, which is to be recorded in the work diary or in the practical training map.

2. In performing each individual exercise within the practical part of the curriculum, the student must be acquainted with sources of danger, adopt safe work procedures and apply protective equipment in accordance with the regulations governing occupational health and safety.

3. Student in the practical part of the curriculum can work only with expert guidance of a teacher in the institution or of a mentor at the employer's premises.

It is precisely on the basis of their work experiences, that students of postgraduate studies, nurses / medical technicians and medical doctors emphasize the necessity to adopt knowledge, skills and attitudes for safety at work.

3. LEGISLATION

The existing legislation includes regulations in the area of health care, compulsory health insurance, pension insurance, medical examinations, occupational diseases, work, occupational health and safety, means of work, risks at work (noise and vibration, carcinogens and mutagens, chemical and biological harms at work, electricity, fire and explosions, computer work, statodynamic exertions, contagious diseases and radiation).

The regulations fully cover the area of protection of occupational health and safety of persons employed in healthcare.

IV. NEEDS

1. KEY PROBLEMS IN THE IMPLEMENTATION OF OCCUPATIONAL HEALTH AND SAFETY

Institutions in charge of ensuring and implementing measures aimed at protecting the health of persons employed in health care include the Ministries competent for health and labour, the Croatian Institute for Protection of Health and Safety at Work, the Croatian Institute of Public Health, the Croatian Health Insurance Fund, and the Croatian Pension Insurance Institute, which participate in the implementation of activities together with other institutions. Further strengthening of coordination processes is expected in the implementation of the National Programme.

One particular issue in the implementation is connected with insufficient data. Data on the impacts of workplace on health or premature retirement of workers are not being monitored, unless the primary cause is occupational disease or injury at work. When the harmful nature of the workplace is one of the causes of disability (but not the main reason), the impact of that harm is not recorded at all. There is no collection of data on the funds dedicated to resolving the consequences of injuries and diseases occurring due to harmful conditions at the workplace.

All these circumstances impacted upon the situation in which the number of diagnosed professional diseases in the Republic of Croatia is relatively low. For example, it has been determined that only 10

per cent of workers regularly control their health status, and that specific health care is practically inaccessible to workers. The number of examined persons in health care is almost negligible, even though, based on the European standards and our data, health care employees work in a branch belonging to economic activities with the highest number of persons suffering from diseases due to the workplace impact.

2. SPECIFIC HEALTH CARE MEASURES

Having in mind the aim of implementing measures aimed at protecting occupational health and safety for persons employed in health care, in accordance with the doctrine of the Croatian Institute for Protection of Health and Safety at Work, it is important to consistently implement specific health care measures, as well as other measures at the primary level. Measures are implemented by occupational health specialists in their offices and at the workplace, as well as employers and occupational health experts. Monitoring of the implementation of specific health care measures is coordinated and undertaken by the Croatian Institute for Protection of Health and Safety at Work.

Specific care for the improvement of health of persons employed in health care who are facing elevated risk is targeted at raising the level of health of persons employed in health care as a whole, the idea being to decrease health risks at the workplace and to decrease morbidity, mortality and disability stemming from disease, as well as injuries and conditions that can be mitigated via preventive measures. The focus is on raising knowledge by implementing health promotion programmes and effective healthcare.

2.1. Measures undertaken by occupational health specialists in occupational health offices

2.1.1. Medical examinations of persons employed in health care in connection with working conditions and risks, harms and exertions in the performance of tasks

2.1.1.1. Preliminary examination prior to employment for jobs with elevated risks and in case of transfer to such jobs

Preliminary examination is undertaken prior to the beginning of the working assignment as a very detailed and comprehensive examination, by determining the health status and analysing the

detailed anamnesis, in particular working anamnesis, with the emphasis on prior professional and ambiance exposures, habits, nutrition, etc. Preliminary examination is based on the defined examination and testing methodology, with a particular focus on the functional examination of organs and organic systems. The examinations are performed with the aim of assessing the health capacity based on medical requirements as a special condition for jobs with elevated risk.

2.1.1.2. Regular periodic examination of employees in jobs with elevated risks

Regular periodic examination is a targeted examination focusing on those organs, organic systems and symptoms that are connected with harmful effects of work processes or working conditions, and it is undertaken based on the defined methodology. The examinations are performed for all workers employed in jobs with special working conditions, within specified timeframes.

2.1.1.3. Unscheduled examinations

Unscheduled examination is undertaken in case of an incident or extraordinary situation and/or in situations that result in changes or significant deviations in the work process or health status.

2.1.1.4. Early periodic examinations in jobs with elevated working risks (control examination)

Early periodic examination is conducted in case of deviating values in the findings of tests performed within periodic or unscheduled examination, with a particular focus on the target organ.

2.1.1.5. Outgoing examinations

Outgoing examination is performed within one week from the end of duties involving elevated risk of occupational diseases and work-related diseases; the content of the examination is the same as in the case of the regular periodic examination.

2.1.2. Examination of persons employed in health care and/or retired persons who are or have been exposed to particular health risks

These are medical examinations of persons employed in health care and/or retired persons who have been exposed to harmful professional factors in their previous job, such as e.g. carcinogens.

2.1.3. Examinations of persons employed in health care for the purposes of determining work capacity in case of occupational disease, injury at work and their consequences

This form of examination is conducted based on professional exposure and job requirements, with the aim of determining the remaining work capacity.

2.1.4. Medical examinations upon the performed surveying

Surveys are performed in order to ensure the selection of persons who should be subject to medical examination where there is no obligation of periodic examination. These examinations are focused on prevention and early diagnosis of diseases that are, in whole or in part, caused by working conditions, or diseases that can be rendered worse as a result of working conditions; another aim is to decrease injuries at work. Medical examinations performed upon the surveying of workers are relevant for:

a) Employees in health care who are employed in jobs with elevated health risk (e.g. night shift work);

b) Employees in health care in other jobs. Medical examinations of persons employed in health care, having in mind the working conditions and risks, harms and exertions in the conduct of tasks, are performed according to the doctrine of the Croatian Institute for the Protection of Health and Safety at Work applicable in practice.

2.2. Measures aimed at promoting health, undertaken by expert teams in the premises of the employer (occupational health specialist, occupational health and safety expert, and psychologist)

2.2.1. Counselling

- Counselling on health, safety, organization and protective equipment at the group (collective) level

This form of counselling is undertaken by providing advice at the group (collective) level, and it represents the provision of information to persons employed in health care regarding health risks in work processes, and regarding health, safety, organization, personal and collective protective equipment, occupational hygiene and ergonomics.

Informative meetings can be organized on topics such as health risks present in individual work processes and methods of protection against the harmful effects of such risks (e.g. on chemical, biological and physical harms, psychosocial exertions, mutagens, carcinogens and teratogens, cytostatics, proper raising and carrying of patients and heavy loads, use of rest during work, use of personal protective equipment and other measures of prevention and protection from injuries at work, occupational diseases and work-related diseases).

- Counselling on health, safety, organization and protective equipment at the individual level

This form of counselling is undertaken by providing advice at an individual level regarding problems connected with the impact of work on health. The counselling is performed at the request of persons employed in health care who face difficulties in connection with the workplace impact.

2.2.2. Education

- Promotion of health by use of health and education materials

The creation and distribution of written educational materials is focused on counselling and the dissemination of knowledge, coupled with the promotion of new insights and ways of living and working, all with the aim of preserving and improving occupational health and safety.

- Education on the practical implementation of preventive measures for the preservation of occupational health

This form of education is conducted by disseminating medical knowledge and providing counselling on the prevention of injuries and most frequent work-related diseases, and it covers various topics, such as: vaccination of health care workers; safe handling of cytostatics; handling sharp objects; procedures in cases of percutaneous incidents; raising and transferring patients.

The education is conducted for all persons employed in jobs that entail risk, and this measure can be organized as a group activity or as an individual activity.

- Education on acute effects of harms at the workplace and procedures in incident situations

This form of education is conducted once per year in all companies in which occupational health specialists provide specific health care services. The education is organized on issues such as acute poisoning due to certain harmful agents, specific forms of first aid, and emergency interventions.

2.3. Assessment of working conditions (risks)

2.3.1. Assessment of working conditions for the purposes of protection against occupational diseases and injuries at work, with continuing care for better adjustment of work to workers

The assessment is undertaken by regular visits to workplaces based on a pre-planned schedule, and it constitutes an obligation in cases that involve changes in work processes and conditions, introduction of new technologies, disturbances in the work processes; also in cases of injury at work and occupational diseases, and in cases of rising morbidity. This activity includes the provision of recommendations for correction and adjustment of working conditions to the capacities and opportunities of the employees, and verification of the implementation of prescribed occupational health and safety measures in workplaces where workers are exposed to harms, risks and exertions that pose a threat to health.

2.3.2. Workplace visits with the aim of workplace analysis at the individual level

The purpose of such visits is to identify, eliminate and/or control risks at the workplace. The visits are conducted in cases of injury at work and occupational diseases, with the aim of assessing the temporary incapacity for work, and providing individual counselling to persons employed in health care who suffered recognized damage to health.

2.4. *Other measures at primary level*

Vaccination of health care workers and protection against infectious agents are ensured depending on the risk at the workplace, and based on the Vaccination Programme reached by the Minister of Health on the basis of the proposal by the Croatian Institute of Public Health.

For example, vaccination against hepatitis B is ensured for persons employed in health care, as well as vaccination against meningitis for health workers employed in institutes of emergency medicine, with the aim of preventing morbidity in connection with those diseases that are covered by the vaccination.

3. REGULAR AND PERMANENT EDUCATION

It is precisely on the basis of their work experiences, that students of postgraduate studies, nurses / medical technicians, medical doctors and other workers in health care emphasize the necessity to adopt knowledge, skills and attitudes for safety at work. We propose that the Ministry of Science, Education and Sports recommends the institutions to introduce a dedicated compulsory course on Safety at Work; alternatively, at least ten teaching hours on the issue of safety at work should be introduced into any of the suitable courses in the first year of studies in all levels of education. In addition, we propose that this course be included in permanent education as its constituent part.

4. MONITORING AND ASSESSMENT INDICATORS

In order to enable monitoring of the situation, and the planning of activities in Programme implementation, the indicators on the following aspects are necessary:

- Presence of individual risks and the level of these risks in individual workplaces;
- Damage to health arising at work: injuries at work; occupational diseases; work-related diseases;
- Impacts of harmful working conditions on work capacity: temporary incapacity for work; permanent incapacity for work or disability;
- Financial indicators of damage to health caused by work in health care: losses due to sick leave, diagnostics, treatment and rehabilitation; temporary and disability retirement.

In the monitoring of the situation and the planning of activities, all participants in the occupational health and safety system must monitor certain data in health care, and make them available in a manner that is consistent with the regulations on the protection of certain forms of data. The following data are required:

- Occupational health data on jobs and workers (data of authorized companies and institutions regarding employers, workers, means of work, and the working environment);
- Data of courts regarding reached and enforced non-pecuniary and pecuniary penalties as a consequence of reports by labour inspectors on the issue of occupational health and safety; data of courts regarding reached and enforced requests for damages in cases of injuries at work and occupational diseases;
- Data of the Croatian Health Insurance Fund regarding the holders of health insurance on the basis of employment;
- Data of the Croatian Health Insurance Fund on collected and spent funds on the basis of insurance for cases of injuries at work and occupational diseases, with cost analysis based on the causes;
- Data of the Croatian Health Insurance Fund on the costs of primary health care, specialist health care and the treatment of health care workers; data on their employers; data on the costs in connection with persons who suffered injury at work and persons with occupational diseases.
- Data of the Croatian Pension Insurance Institute on costs per individual employment right in the health care sector.

The Croatian Institute for Protection of Health and Safety at Work and the Croatian Health Insurance Fund, in cooperation with the WHO Collaborating Centre for Occupational Health, will be delivering annual reports on the implementation of the National Programme to the Ministry of Health.

5. FINANCING AND TIMELINE

The protection of occupational health constitutes an obligation of the employer, and the employer has the duty to ensure effective implementation of occupational health and safety. For some time, employers in general, including employers in the health care sector, have had the duty to perform measurements of various chemical and physical harms, to test the equipment and devices which entail elevated danger, to ensure appropriate protective equipment, to prepare the assessment of risks, and to ensure the work of occupational health and safety committees (costs outside of the system of contributions).

Employers are paying a 0.5 % contribution for costs funded from the compulsory health insurance contributions, in connection with injuries at work and occupational diseases, which is relevant for the implementation of specific health care for persons employed in the health care sector. That includes preliminary, periodic and control medical examinations; diagnostic procedures for the purposes of determining occupational diseases; fulfilment of the rights stemming from compulsory health insurance in case of recognized injuries at work or occupational diseases of persons employed in health care (treatment, financial compensation) – all in accordance with the relevant provisions of the Compulsory Health Insurance Act and the provisions of the relevant bylaws.

No additional funds from the State Budget will be required for the implementation of the Programme. The implementation will be ensured based on the funds dedicated to regular activities. Monitoring of the implementation and annual reports will be consolidated by the Croatian Institute for Protection of Health and Safety at Work, and delivered to the Ministry of Health.

TIMELINE 2015-2020

ACTIVITY GOAL	IMPLEMENTING AGENCY	TIMELINE
Establishment of the coordination of institutions in charge of ensuring and implementing measures for the protection of health of persons employed in health care: Ministries competent for health and labour; Croatian Institute for Protection of Health and Safety at Work; Croatian Institute of Public Health; , Croatian Health Insurance Fund; Croatian Pension Insurance Institute; State Inspectorate; Agency for Quality and Accreditation in Health Care and Social Welfare	Ministry of Health; Ministry of Labour and Pension System; Croatian Institute for Protection of Health and Safety at Work; Agency for Quality and Accreditation in Health Care and Social Welfare	Continuously from 2015 to 2020
Establishment of the register of persons employed in health care facing elevated risk	Croatian Institute for Protection of Health and Safety at Work; all legal entities in health care;	Until the end of 2015
Monitoring of the health status of every person employed in health care in view of working conditions and risks, harms and exertions in the performance of tasks	Occupational Health Services in cooperation with general practitioners / family physicians	Continuously from 2015 to 2020
Monitoring of health care employees who have fallen ill with the aim of recognizing work-related diseases	Occupational Health Services; Croatian Health Insurance Fund; WHO Collaborating Centre for Occupational Health	Continuously from 2015 to 2020
Implementation of the pilot project of the National Programme on Occupational Health and Safety for Persons Employed in Health Care for the period 2014-2020 in the General Hospital Karlovac	Ministry of Health of the Republic of Croatia; WHO Collaborating Centre for Occupational Health	From 2015 to 2016