

Restructuring the Employment Injury Insurance System in Serbia

Further analysis of reform options

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Foreword

In the framework of the Decent Work Country Programme of the Republic of Serbia, the ILO conducted a technical mission in 2011 to review the current benefit and financing structure and the organizational arrangements of benefits for work accidents and occupational diseases. The main findings and recommendations were presented in the ILO report “Employment Injury Protection in Serbia: Issues and Options” published in 2012.

At the request of the Government of Serbia, the ILO carried out further technical assistance in 2013 on the analysis of the reporting of work accidents and occupational diseases, and on the actuarial study for determining the contribution rates of the employment injury insurance system. This report presents the results of the analysis and key recommendations.

This report was written under the supervision of Kenichi Hirose, Senior Social Protection Specialist, ILO Decent Work Technical Support Team and Country Office for Central and Eastern Europe (ILO DWT/CO-Budapest) with the following international experts.

A joint mission with the Occupational Safety and Health Expert, Helmut Ehnes (Director for Prevention of the German Social Accident Insurance Institution for the Raw Materials and Chemical Industry, BG RCI), was conducted in January 2013 to analyze and evaluate the current reporting system, data collection and analysis of work accidents and occupational diseases in Serbia. The key findings are presented in Chapter 2, sections 2.1 to 2.3.

Then, a joint mission with the Actuarial Expert, Gilles Binet, was undertaken in March 2013 to collect statistical and financial data and conduct consultations with the Government and social partners. The main results and methodology on the estimation of contribution rates for employment injury benefits are presented in Chapter 3, Annexes A, B.2 and B.3.

Finally, a joint mission with the IT Expert in Social Security, John Angelini, was carried out in November 2013 to conduct an initial assessment of the new work injury reporting system. The key results of the assessment are presented in Chapter 2, section 2.4 and Annex C.

The draft report was presented at the Tripartite Meeting on Employment Injury Insurance in Serbia held on 7 November 2013 in Belgrade. The comments received by the government authorities and representatives of the social partners at the meeting have been reflected in this final report. Jovan Protic, the ILO National Coordinator for Serbia, provided valuable assistance throughout the conduct of the mission and the preparation of this report. Lynn Villacorta provided English editing of this report. Olga Dontsova, intern at ILO DWT/CO-Budapest, provided editorial assistance in finalizing this report.

This report is organized as follows. Chapter 1 summarizes the current employment injury benefits in Serbia. Chapter 2 analyses the problems with the reporting of work injuries and occupational diseases. Chapter 3 presents the determination of the estimated cost of employment injury benefits and variants of risk-based contribution rates. Chapter 4 concludes with the summary recommendations and their implementation strategies. Three Annexes supplement the report with explanations of detailed technical issues. Annex A presents the process of actuarial estimation of contribution rates. Annex B presents case studies of the contribution rating systems in Japan, Quebec and Romania. Annex C presents detailed technical assessment of the new work injury reporting system.

Serbia has been committed to developing a new legislation on the employment injury insurance system. We trust that key findings and recommendations formulated in this report will serve as the basis for the development of national policy on employment injury protection with the active involvement of social partners.

Budapest, December 2013

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Abbreviations

HI Fund	Republic Health Insurance Fund
ILO	International Labour Organization
LI	Labour Inspectorate
NACE	European Classification of Economic Activities
OSH	Occupational safety and health
PAYG	Pay-as-you-go
PIO Fund	Republic Fund for Pension and Disability Insurance

Exchange rate

1 Euro = 114.86 Serbian dinar (RSD) (as of 10 December 2013)
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1. Employment injury benefits in Serbia

1.1 Introduction

Serbia provides comprehensive social security benefits, including employment injury benefits.¹ However, the employment injury benefits are not regulated by a single law or administered by a single institution. Most of the employment injury benefits are provided in the framework of health insurance and pension and disability insurance.² Moreover, employers are directly responsible for some benefits, specifically the cash benefits for temporary incapacity to work.

Since the current system does not give strong emphasis on occupational risk, there is a considerable under-reporting of work accidents and occupational diseases. As a consequence, a large number of work-related cases are not properly compensated, or more likely, treated as non work-related cases which provide a lower level of cash benefit or require certain cost sharing of medical costs. This problem is primarily due to the low awareness of the compliance with reporting obligation on the part of both employers and workers. It is also connected with weak enforcement mechanisms and complex reporting procedures.

In particular, the complexity with the reporting causes the following major problems.

- First, incomplete understanding of the causes of work accidents and occupational diseases makes it difficult for occupational safety and health (OSH) authorities to design and implement effective prevention measures and to monitor their impact.
- Second, the absence of a clear line of demarcation between work-related cases and general cases, as well as the elements of employers' liability, make it difficult to quantify the overall costs of occupational risks, which are to be financed exclusively by employers. This inhibits the competent authorities from designing possible incentive measures such as differential contribution rates for different risk groups and experience-based contribution rates (also known as the "bonus-malus" system).

In this context, the ILO has conducted further analysis with respect to (i) the measures to improve the reporting of work accidents and occupational diseases, and (ii) the actuarial evaluation of the costs of employment injury benefits and the methods for determining contribution rates.

1.2 Current provisions of employment injury benefits in Serbia

This section summarizes the current provisions of employment injury benefits in Serbia. Table 1.1 provides an overview of the social security benefits against accidents and sicknesses for work-related and general cases.

¹ In this report, the term employment injury includes accidents at work and occupational diseases.

² This is a common characteristic of employment injury benefits systems in former Yugoslav countries.

(1) Legislation

Article 53 of the Law on Occupational Safety and Health (*Official Gazette of the RS*, 101/2005) stipulates that:

“Employer shall be liable to insure Employees for injuries at work, occupational diseases and work-related diseases, in order to ensure compensations.

The financial means for insurance (...) shall be borne by Employer, and they shall be determined subject to the level of risk from injury, professional disease or work-related disease with regard to the workplace and working environment.

The requirements and procedures concerning insurance from injuries at work, occupational diseases and work-related diseases of Employees shall be governed by the Law”.

As noted earlier, most of the employment injury benefits are provided through the existing social insurance systems. The main laws and administrative bodies³ are as follows:

- The Health Insurance Law (*Official Gazette of the RS* No. 34/2003) administered by the Republic Health Insurance Fund (HI Fund); and
- The Pension and Disability Insurance Law (*Official Gazette of the RS* No. 34/2003) administered by the Republic Pension and Disability Insurance Fund (PIO Fund).

In addition, short-term sickness benefits (salary benefits) in the case of work-related injuries and occupational diseases rely on the direct financial liability of the employer.

(2) Medical care

In case of morbid conditions, workers can receive comprehensive medical care from health care providers contracted by the Health Insurance Fund. For general cases, three months’ insurance period is necessary to be eligible for medical care benefits, and cost-sharing (up to 35 percent) is required for certain medical services. For work-related cases, which do not require any insurance period, the health insurance covers the full cost of examination, treatment and (medical) rehabilitation.

(3) Cash benefits for temporary incapacity to work

On the occurrence of an accident or disease, cash sickness benefits for temporary incapacity to work, commonly referred to as salary benefits, are payable for up to six months. No minimum insurance period is required. For general cases, the benefit equals 65 percent of the base salary (defined as the average salary of the three months preceding the incident). In terms of the duration, the employer is responsible for the payment of the first 30 days thereafter the Health Insurance Fund will take over the payment for up to five months. For work-related cases, the benefit is set at 100 percent of the base salary and the employer is responsible for the payment of the benefit throughout the entire duration of the incapacity.

³ These social security institutions are in charge of the maintenance of workers’ contribution records, establishment of benefit rights and payment of the benefits. Since 2003 the Tax Authority has been responsible for the collection of social security contributions.

(4) Disability pensions for permanent loss of capacity for work and other benefits

If the injured worker is not fit for work after six months, the case is then referred to the Medical Commission of the Pension and Disability Insurance Fund for an assessment of permanent disability.⁴ Disability pensions are payable as long as the disability persists⁵ by the Pension and Disability Insurance Fund. To be eligible for this benefit, five years' insurance period (shortened for workers who are 30 years of age or less) is required for general cases, while there is no minimum insurance period for work-related cases.

Similar to old-age pensions, a disability pension is calculated as a product of (i) the personal coefficient (ratio of a worker's insurable earnings to the average salary in a calendar year averaged over the entire contribution period), (ii) the general point, and (iii) the number of pensionable years. Concerning the first two factors in the pension formula, a common definition is applied for both work-related and general cases. Concerning the pensionable period, the full career period of 40 years is taken into account for disability resulting from work-related injuries; whereas, the pensionable period for general disability cases is calculated on the actual insurance years plus an additional amount depending on the age of the insured worker at the determination of disability.⁶

During the transition period in the 1990s Serbia applied quite generous criteria for disability partly because the pension system was used to meet the imminent need of income for the unemployed. However, the Pension and Disability Insurance Law of 2003 has adopted a strict definition of disability. In the current law, an insured worker is entitled to a disability pension in the case of total and permanent loss of working ability.

Apart from the disability pension, the Law on Pension and Disability Insurance also provides cash benefits on grounds of "bodily impairment" caused by a work injury or an occupational disease.⁷ A bodily impairment is defined as a loss, severe damage or disability of specific organs or body parts, irrespective of whether or not this results in disability. This benefit is a fixed amount depending on the severity of impairment ranging from 30 percent to 100 percent in eight categories. If the assessed impairment is below 30 percent, no benefit is payable. The benefit amount is currently 1,500 Serbian dinars (RSD) for 30 percent, and 6,000 RSD for 100 percent. This benefit is paid monthly and adjusted in line with the pension indexation.

There is also cash compensation payable for persons who provide care for insured persons or pensioners who, due to injury or sickness, require constant attendance for their basic life needs. A fixed amount benefit is paid monthly and adjusted in line with the pension indexation.

⁴ When a claim is filed for a general case, the Health Insurance Fund continues to cover the salary benefit for up to 60 days, which is the maximum time allowed for a decision by the Medical Commission. The equivalent amount will be reimbursed from the Pension and Disability Insurance Fund to the Health Insurance Fund retroactively.

⁵ Persons receiving disability pensions have to undergo regular assessments of disability. However, there is an issue regarding pensioners who go back to work. For disability pensioners who have a fixed-term employment contract, no assessment is required. In contrast, if they have an open-ended employment, they are obliged to undertake the assessment.

⁶ The additional period is calculated as the sum of (a) two-thirds for each year between the age of the insured worker and 53 years, and (b) one-third for each year between 53 years and the normal retirement age (65 years for men and 60 years for women). If the insured worker is more than 53 years, then term (a) is regarded as zero, and "53 years" in term (b) is replaced by "the age of the insured worker".

⁷ This benefit has been paid since the time of the former Yugoslav social security system.

(5) Survivors' pensions and funeral grants

Survivors' pensions are payable to orphans up to 15 years of age (26 years if at university, no age limit for disabled children) and widows who are at least 50 years of age (increased gradually to 53 years by 2017) or widowers who are at least 55 years of age (increased gradually to 58 years by 2017). The amount of survivors' pensions is determined as a percentage of the amount of old-age or disability pension to which the insured worker is entitled (or the pension received by the pensioner) at the time of death. The percentage depends on the number of survivors, ranging from 70 percent for one survivor, 80 percent for two, 90 percent for three, and 100 percent for four or more. To be eligible for this benefit, the deceased person was either a pensioner or an insured worker with five years' insurance period, while no minimum insurance period is required for work-related cases.

In addition, a funeral grant, equivalent to 1.5 times the average monthly pension, is payable to a person who covered the funeral cost of the deceased person.

(6) Financing

The main source of financing health insurance and pension and disability insurance is contributions from insured workers and employers. The contribution rate for the Health Insurance Fund is 12.3 percent. Since May 2013, the contribution rate for the Pension and Disability Insurance Fund has been increased to 24 percent from the previous 22 percent.

These contribution rates for health insurance and pensions are shared equally by employers and workers. Therefore, despite the general rule that the compensation of work-related accidents and diseases should be financed exclusively by employers, there is no employer contribution earmarked for employment injury benefits.

It is reported that if an employer is at fault for work accidents or occupational diseases, the Health Insurance Fund and the Pension and Disability Insurance Fund can claim the reimbursement of the relevant benefit amounts from the employer. However, these funds manage to recover only a small part the amounts due (mostly by court order).

The budget of the Health Insurance Fund has been more or less in balance in recent years. Of the total expenditure of 195 billion RSD in 2011, the amount of the salary benefits and transportation costs represents only 4 percent.⁸ In spite of its relative financial stability, the Health Insurance Fund faces a major problem in securing a stable contribution income to respond to the increasing need for quality health care.⁹

On the other hand, the budget of the Pension and Disability Insurance Fund has been chronically in deficit. The magnitude of the pension deficit, which is covered by the State budget, is in the order of 7 percent of GDP. Since its promulgation in 2003, major amendments to the Pension and Disability Insurance Act have been made in 2005 and in 2010.¹⁰ However, with the continual ageing of the population, the Serbian pension system is facing a huge challenge to restore its long-term sustainability while providing adequate income security for the elderly.

⁸ The remaining components of the expenditure include: 46 percent for salaries of medical personnel, 36 percent for health care costs of the medical institutions, 12 percent for prescribed medicines, and 2 percent for the administrative expenses of the Health Insurance Fund.

⁹ The cumulative amount of uncollected contributions from public enterprises exceeds 80 billion RSD.

¹⁰ With respect to the policy debate in the 2010 reform, see "*Pension Reform in Serbia- from international and regional perspectives*" (Proceedings of the Conference on Pension Reform in Serbia, 24-25 September 2009, Belgrade), ILO.

**Table 1.1 Overview of the social security benefits against accidents and sicknesses in Serbia
(comparison of work-related and general cases)**

Contingency	Benefit	Amount	Duration	Benefits provided by	Qualifying period	Financing
Temporary inability to work	Medical care (General)	In kind	Throughout the contingency	Medical institutions (public and private) contracted by Republic Health Insurance Fund (HI Fund)	3 months (except for urgent medical care)	Employers and employees contribute equally to HI Fund. State covers any deficit. Patients copayment up to 35%
	Medical care (Work-related)	In kind	As above	As above	None	As above Patients no copayment
	Cash sickness benefit (General)	65% of salary	Throughout the contingency. After 6 months HI Fund is obliged to present the case to Medical Commission of Republic Fund for Pension and Disability Insurance (PIO Fund) to assess disability to grant disability pension	The employer pays for the first 30 days, then RHIF covers up to 5 months and during the assessment up to 2 months	None	As above
	Cash sickness benefit (Work related)	100% of salary	As above	The employer pays up to 6 months. HI Fund pays during the assessment up to 2 months	None	As above
Total loss of capacity to work	Disability pension (General)	Pension based on the actual insurance period plus 2/3 till age 53 and plus 1/3 of the remaining years until the retirement age	Throughout the contingency	Republic Fund for Pension and Disability Insurance (PIO Fund)	5 years of insurance (reduced if aged 30 or less)	Employers and employees contribute equally to PIO Fund. State covers any deficit.
	Disability pension (Work-related)	Pension based on 40 years of insurance	As above	As above	None	As above
	Cash compensation for body impairment (Work-related)	Fixed rates according to body damage from 30% to 100%, indexed as pensions. The full amount is RSD 6,000.	As above	As above	None	As above
	Cash compensation for constant attendance	Fixed rates, indexed as pensions	As above	As above	None	As above
Death	Survivors' pension (General)	From 70% (1 survivor) to 100% (4 survivors or more) of the pension of the deceased	Throughout the contingency (widows aged 50.5 years or more; widowers aged 55.5 years or more; orphans' age limit 15 years, 26 years if in education)	As above	The deceased was a pensioner or had 5 years coverage	As above
	Survivors' pension (Work-related)	As above	As above	As above	None	As above
	Funeral grant	150% of the average pension	As above	As above	None	As above

2. Reporting of work accidents and occupational diseases in Serbia

2.1 The current work injury reporting system

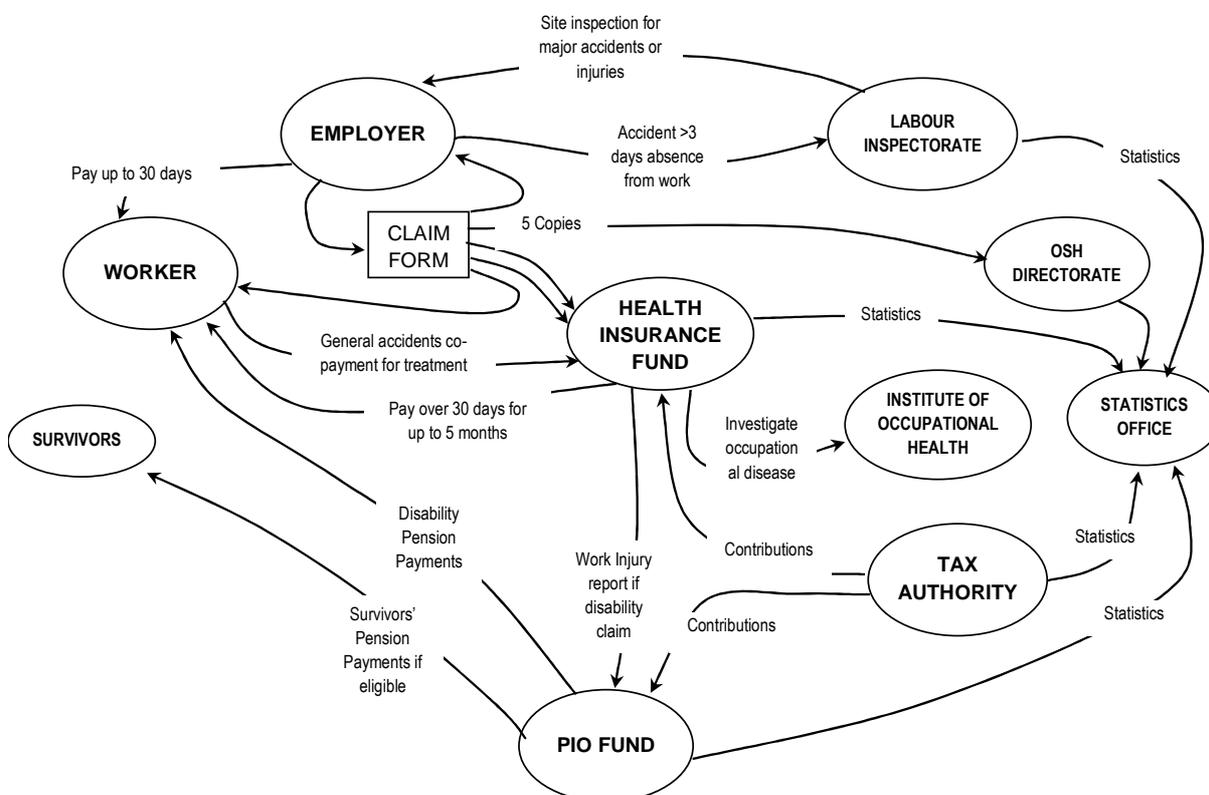
(1) Overview of the current reporting system

Besides the workers and employers, the key institutions involved in the reporting of work injuries include:

- the OSH Directorate under the Ministry of Labour and Social Policy;
- the Labour Inspectorate under the Ministry of Labour and Social Policy;
- the Institute of Occupational Health under the Ministry of Health;
- the Health Insurance Fund;
- the Pension and Disability Insurance Fund.

Figure 2.1 illustrates the information flow between these institutions under the current reporting system.

Figure 2.1 Information flow under the current reporting system



The process of reporting in the current system is described as follows. According to the Law on Occupational Safety and Health, employers are responsible for reporting any major work accidents resulting in more than three days of absence. However, in the current system, two lines of reporting exist.

First, the employer should notify the Labour Inspectorate within 24 hours of the occurrence of the accident (usually by telephone).¹¹ Based on the direct notification from employers, the Labour Inspectorate will conduct inspections. For each inspection, the Labour Inspectorate prepares a detailed report.

Second, the employer should complete a work injury report form to claim employment injury benefits.¹² The work injury report form for the benefit claim consists of nine pages. Five copies of the form will be submitted to the injured worker, the employer, the OSH Directorate, and the Health Insurance Fund (two copies). The Labour Inspectorate is not included in the list of recipients. The Health Insurance Fund will submit one copy of the work injury report form to the Pension and Disability Insurance Fund when the beneficiary is assessed to be permanently disabled and eligible for disability pensions.

As Table 2.1 shows, the existing report form is comprised of eight sections, two of which have additional signature and identity blocks.

Table 2.1 Structure of the current work injury report form

Data group heading	Fields
I. Employer's data	6
II. Data on person appointed to be responsible for safety and health	3
III. Data on injured person	9
IV. Data on direct supervisor of injured person	4
V. Data on workplace and jobs of injured person, as well as on time and place of injury occurrence	19
VI. Data on witness	3
VII. Data on work - related injury and measures for safety and health in work that were applied in workplace where the injured person worked	14
Signature and Identity Block fields	5
VIII. The findings and the opinion of physician who first examined the injured person	6
Signature and Identity Block Fields (6 +4)	10
Total fields	80

The total of 80 fields, many of which are free text entry makes this a substantial form albeit that it is completed by two parties, the employer and the medical officer.

(2) The number of reported work injuries and occupational diseases

Table 2.2 presents the number of reported work injuries and occupational diseases and the number of work accident inspections in Serbia from 2000 to 2012.

¹¹ Article 50 of the Law on Occupational Safety and Health.

¹² Article 51 of the Law on Occupational Safety and Health. The reporting form is provided by Rule of Procedure No. 2163, *Official Gazette of the RS* No. 72/2006.

Table 2.2 Number of reported work accidents and occupational diseases in Serbia, 2000-2012

Year	Number of work accidents	Number of work accident inspections					Number of occupational diseases
		Total	Death	Severe	Light	Collective	
2000	27,908	835	32	788	-	15	232
2001	27,026	489	25	448	-	16	205
2002	26,391	831	48	771	-	12	143
2003	21,903	829	25	794	-	10	97
2004	24,290	811	47	742	-	22	80
2005	21,924	1,037	43	907	56	31	78
2006	-	1,102	54	966	82	27	66
2007	-	1,330	28	1,140	162	28	104
2008	-	1,285	42	1,034	177	32	57
2009	21,870	1,286	37	1,004 (18)	223	22	29
2010	22,481	1,322	35	1,026 (21)	232	29	30
2011	19,717	1,082	28	976 (18)	54	24	23
2012	15,843	1,243	26	1,016 (13)	177	24	19

Source: Republic Health Insurance Fund (number of work accidents), Labour Inspectorate (number of work accident inspections), Institute of Occupational Health (number of occupational diseases).

Notes: The numbers in brackets in the fifth column from 2009 onwards indicate the severe injuries which resulted in death at the hospital.

The following observations and remarks are made:

- The Health Insurance Fund keeps data on the number of cases and expenditure on work-related sick leave and medical care. However, the expenditure on medical care does not reflect the full medical costs. The Pension and Disability Insurance Fund keeps data on the number of cases and expenditure on newly awarded disability pensions due to work-related causes and the bodily damage benefits. Due to the change in the IT system several years ago, information on accidents by the industrial sector is no longer available.
- The Health Insurance Fund receives more than 20,000 work accident claims annually. For the period 2010-2012, 82.2 percent were light, 17.6 percent, severe and 0.1 percent, fatal. The decrease in the number of reported cases in 2011 and 2012 is due to the amendment of the Health Insurance Law which excludes commuting accidents from work injuries.¹³ Recently, however, the Constitutional Court has overruled this amendment. From 2013 onwards, the number of work accidents is expected to go back to the previous level. Incidentally this experience reveals the size of commuting accidents, which is estimated at around 5,000 annually, or around one-fourth of the total work injury cases.
- It was discovered that the work injury report forms are not always sent to all the four institutions mentioned above. In fact, the OSH Directorate receives only a portion of the forms (around 9,000) and does not share them with the Labour Inspectorate.

¹³ In contrast, the Pension and Disability Insurance Law has always regarded disability caused by commuting to workplaces as work-related.

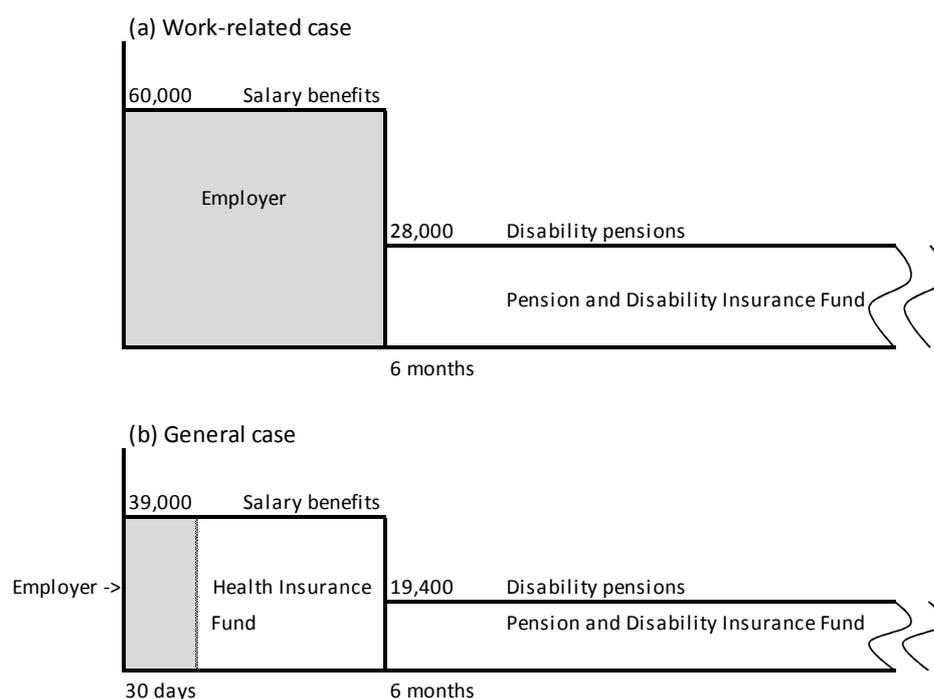
- The Labour Inspectorate annually conducts around 1,300 inspections of work accidents, two-thirds of which occur in the construction sector. The number of inspections accounts for only around 6.5 percent of the total reported work accidents. The inspection is focused on severe, collective, and fatal cases. A comparison with the Health Insurance Fund data indicates that although almost all fatal cases are inspected, only one-third of severe cases are investigated by the labour inspectors.
- With regard to occupational diseases, although the Institute of Occupational Health had recorded more than 200 cases in the beginning of the 2000s, the number has diminished to less than 30 in recent years. It is obvious that the notification system for reporting occupational diseases does not function effectively. Currently, there is no unique occupational diseases register, nor unique criteria for the identification of occupational diseases.

2.2 Under-reporting of work accidents and its consequences

The number of reported work accidents and occupational diseases accounts for only a small portion of the real figures. Interviews with the social partners indicated that the practice of non-reporting is likely to be prevalent in small-sized private enterprises with no trade union or OSH committee. To provide indirect evidence of under-reporting of work accidents in Serbia, Table 2.3 compares work accidents and basic labour market statistics of Serbia and Germany. As explained above, the number of reported work accidents in Serbia is assumed to be 20,000.

Table 2.3 Work accident data and labour market indicators in Serbia and Germany, 2012

	Serbia	Germany
Population	7.5 million	81.8 million
Employed population	2.3 million	41.1 million
Number of enterprises	0.22 million	3.23 million
Reported work accidents (absence more than three days)	20,000	1,007,864
Reported work accidents per 1000 employed population	8.7	26.0
Labour inspectors (all)	259	5,400
Labour inspectors per 1000 enterprises	0.80	1.67
Labour inspectors (OSH inspection)	115	5,400
Labour inspectors per 1000 enterprises (OSH) inspection	0.36	1.67

Figure 2.2 Comparison of cash benefits between work-related and general cases

Notes: Benefits are calculated for a 40 year-old average wage worker with a 15-year insurance period. The average wage is assumed to be 60,000 RSD per month.

It is observed that the rate of reported work accidents per 100 employed population in Serbia is almost three times less than that of Germany (8.7 cases as opposed to 26.0 cases). However, due to the under-reporting problem, this does not mean that Serbian enjoys a much higher level of workplace safety than Germany. If one assumes that Serbia has the same rate of reported work accidents as Germany, a simple estimation shows that the actual number of work accidents in Serbia would be almost three times more than the reported cases. It should be noted that if Serbia has higher actual incidence rates of work accidents than Germany, the number will be accordingly higher.

Significant under-reporting entails a number of negative consequences. Major issues are as follows.

- A large number of work-related cases are treated as general cases. This means that the injured workers and their families do not receive the compensation to which they are legally entitled. Instead they only receive a lower level of benefits or are required to share certain medical care costs, although at a modest amount (See Figure 2.2). Some workers, especially those working in small enterprises with no trade union, may have weak bargaining power and have no option but to agree to conceal the real cause of their injuries/diseases or to accept any illegal settlement offered by their employers.
- From a financing point of view, because of the equal sharing of the total contributions for pensions and health insurance, under-reporting undermines the employers' financial responsibility for compensation against any employment injuries.

- Incomplete understanding of the causes of work accidents and occupational diseases also makes it difficult for OSH authorities to design and implement effective prevention measures and to monitor their impact. Without reliable statistics it is difficult to set rational targets and to identify priority areas of action in which investments in prevention activities need to be made to reduce work-related accidents and diseases.
- Further, the absence of a clear line of demarcation between work-related cases and general cases makes it difficult to quantify the costs of employment injury benefits. This inhibits the competent authorities from applying differential contribution rates which reflect the degree of occupational risk of different industries or to adjust contribution rates based on past experience (also known as the “bonus-malus” system).

2.3 Problem analysis and recommended actions

This section analyses the underlying causes and conditions for non-reporting and presents recommendations for corrective actions.

(1) Low awareness and low involvement of social partners

First and foremost, there is a lack of awareness of the fact that proper reporting is an important step for the compensation and prevention of work accidents and occupational diseases. It appears that compliance with the reporting obligation is not a well-established practice among employers and workers in Serbia. It should be recognized that a well-functioning national OSH system and employment injury benefit system will not only improve working conditions but also will contribute to improved productivity and economic growth.

Social partners should play a more active role in ensuring work accident reporting, and more generally, in the effort to create a safety culture at the enterprise, industry and national levels. To achieve this, it is crucial to strengthen their capacities through effective training and to raise their awareness through information and education activities. Extending such support to workers in enterprises with no trade unions, to self-employed workers and to farmers should also be considered.

(2) Deficiencies in the reporting procedure

The reporting process needs to be reviewed, and the roles and responsibilities of employers, workers, the Labour Inspectorate, the OSH Directorate, the Health Insurance Fund and the Pension and Disability Insurance Fund need to be clearly defined.

The current two-channel notification process should be streamlined and unified. A work injury report form should be submitted to one focal point institution which is in charge of its (electronic) distribution to all the other relevant authorities, including the Labour Inspectorate.

An error and fraud control mechanism for reporting should be introduced. For this purpose, the representatives of the workers should sign the work injury report form in addition to the employer. Also, medical doctors and hospital staff can remind the employers to report and

can serve as an independent source to collect supplementary information on occupational accidents and diseases.

The current work injury report form which requires detailed data (80 fields in nine pages) is creating an excessive administrative burden on employers. The reporting form, which should collect the essential information, needs to be simplified to allow employers to complete it with less time and effort.¹⁴ The forms should be available both in electronic and printed versions.

The collected data on work accidents and occupational injuries should be analysed systematically and the results should be presented in an OSH report, or the National OSH Profile. These statistics will serve as the basis for preventive interventions, in particular the National OSH Programme.¹⁵

(3) Weak enforcement mechanism

The current system relies on the employers' voluntary compliance with their reporting obligation. It does not have any effective enforcement mechanism.

Although labour inspectors investigate fatal and severe accidents and prepare detailed reports, they should give greater attention to work injury reporting especially for small and medium-sized enterprises. It is recommended that at least 50 percent of severe accidents should be inspected by the Labour Inspectorate. In order for the Labour Inspectorate to conduct more safety inspections with its limited resources, the technical capacity of the inspectors to provide integrated services should be strengthened. As indicated in Table 2.3, in Germany all labour inspectors are technically competent to conduct safety inspections. In order to plan inspections in a targeted manner, the Labour Inspectorate should receive all work injury reports without delay.

At the same time, legal instruments, such as the right to impose penalties or to prosecute, should be available to labour inspectors. By using these instruments strategically, labour inspectors can better influence the employers who fail to comply with the reporting obligation.

However, punitive control measures alone will not be sufficient. They should be complemented with measures which motivate employers to report all accidents and diseases at work. One such incentive measure is to give awards for enterprises with good safety performance. Again, the prerequisite is that the reporting system functions well. In case non-reporting is detected with a winner of such an award, it should be repealed retrospectively.

¹⁴ Examples of the work accident report form of the German system and the UK system are presented in Appendix II of "Improvement of national reporting, data collection and analysis of occupational accidents and diseases", Safe Work Working Paper, ILO, 2012. It should be noted that these countries require the reporting of "accidents" instead of "injuries".

¹⁵ Examples of other European countries are presented in Appendix III of "Improvement of national reporting, data collection and analysis of occupational accidents and diseases", Safe Work Working Paper, ILO, 2012.

(4) Problem with employers' direct liability

The existing legislation contains certain elements which may act as disincentives for employers to report work accidents and diseases.

As a typical example, according to the current legislation, the maximum amount of short-term sickness benefits (salary benefits) that an employer is liable to pay is 6 months' salary for work-related cases (100 percent of salary for up to six months), while for non work-related cases it is 65 percent of salary for the first 30 days, as any further payment will be covered by the Health Insurance Fund. In the absence of an effective enforcement mechanism, such a large discrepancy in the direct financial costs may lead some employers to fail to report an accident. If the compliance with work accident reporting is improved, it is expected that the employers would prefer to cover employment injury benefits by social insurance rather than their own direct liability.

Clearly, the direction for Serbia is to transform short-term disability benefits (salary benefits) from direct employer liability into an insurance benefit. It should be also noted that international labour standards on employment injury protection mandate that cash benefits should be financed by insurance or taxation.

(5) Lack of integrated approach to occupational risk management

The occupational risk management is fragmented in Serbia. A number of institutions are involved in each of the three phases of occupational risk management, (namely, prevention–compensation – rehabilitation). Each institution works only within the scope of its jurisdiction. However, there is neither a close coordination between these institutions nor a national authority which oversees all aspects of occupational risk management from a broader perspective.

On the one hand, the existing work accident data processed by the Health Insurance Fund and the Pension and Disability Insurance Fund are not sufficiently used by the OSH Directorate and the Labour Inspectorate to plan targeted prevention activities. On the other hand, the impact of prevention in terms of the reduction in benefit expenditure and labour costs is not adequately appreciated by the Health Insurance Fund and the Pension and Disability Insurance Fund or by some employers.

In view of the fragmented structure in Serbia, a more coordinated approach on occupational risk management is required.

2.4 The new work injury reporting system

In order to improve the reporting of work injuries and occupational diseases, the Institute of Occupational Health in the Ministry of Health has been developing a new IT system for work injury reporting.

The new reporting system and processes are designed within the current legislative framework and the distributed responsibilities for various components of occupational injury management across agencies. However, the new system introduces a substantial change from

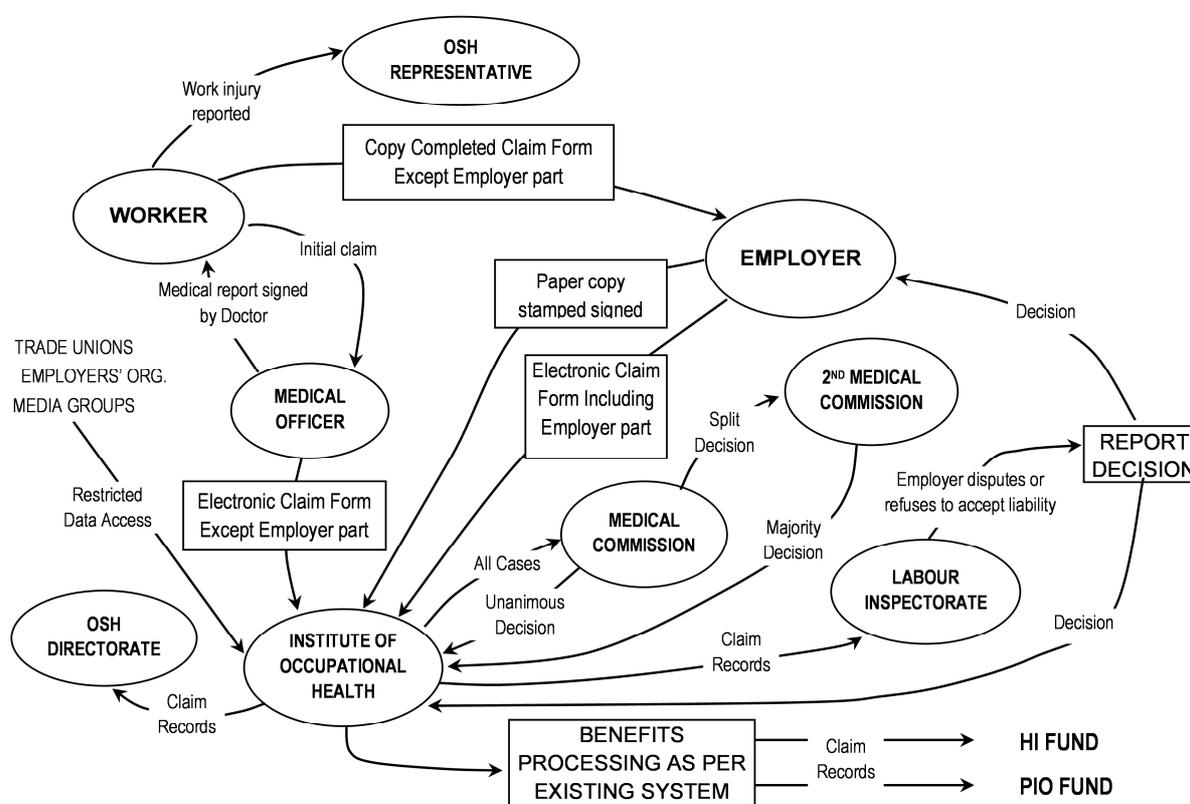
the current system and is expected to improve the reporting of work injuries using the standardized international coding system. The Government started to pilot this reporting system in Valjevo in 2013, and plans to extend it to the whole country by mid-2014.

This section provides an overview and an initial assessment of the new reporting system. Annex C presents detailed technical assessment based on the experience of the system development and the initial implementation.

(1) An overview of the new system

Figure 2.3 illustrates the whole process graphically.

Figure 2.3 Information flow under the new reporting system



Step 1. Initial reporting process

In the new system the injured worker or his/her representative reports the injury to the OSH representative in the workplace and the employer. In the event of serious or collective injuries the employer is obliged to inform the local branch of the Labour Inspectorate.

The injured worker usually attends the primary health care centre for treatment. During this process the medical officer is required to complete the medical information in the health care centre's existing electronic health recording system and completes the work injury report form.

The medical officer is required to print the work injury report form in two parts, the first part for the employer to complete and the second part which is the medical officer's report. The

worker or his/her representative is responsible for providing the paper copy of the work injury report to the employer who is required to complete the form online if he/she has internet access and electronically transferred to the Institute of Occupational Health.

The employer is also required to print, sign and place the company seal on the paper copy which is mailed to the Institute of Occupational Health. For those employers without internet access, the local office of the Health Insurance Fund has been identified to assist these employers complete the work injury report forms online. This additional step is designed to eliminate the opportunity for false claims being generated electronically. The employer response is required within 48 hours and failure to comply will result in follow up action from the Institute of Occupational Health.

The Institute of Occupational Health is the central hub for all work injury reports that are received electronically from medical officers and in paper from employers.

Step 2. Validation of work injuries

This process is designed to validate the work injury. At each local provincial centre (about 26 in total), a Medical Commission composed of three medical doctors is appointed to adjudicate on a range of medical diagnoses and treatments. The commission is expected to return a unanimous decision by the three members. In the event this is not achieved then a second commission would be consulted and the majority decision accepted.

In the event of dispute by the employer the case is referred to the local Labour Inspectorate which in normal circumstances will conduct a site visit and produce a report and make a final decision. The only recourse for a dissatisfied worker is then through the civil courts. This can be a lengthy and costly exercise and there is anecdotal evidence of cases taking several years to resolve.

Step 3. Lodgement of claim and completion of work injury recording

In this process the validated final form is printed and sent to the injured worker and to the employer. Either party may lodge the claim form with the Health Insurance Fund for assessment.

There is an opportunity to allow for an additional control if required. Individual claims for payment by each medical officer and monthly summaries are sent electronically to the Health Insurance Fund. These claims for payment and the work injury report forms can be cross-referenced as an additional control if required.

The new system is also designed to provide a range of standard statistical reports to the major stakeholders who will be given various levels of access to the database. Limited access is also planned to be provided to trade unions and employers' organizations. Given the requirement to raise the public awareness on OSH, it is also proposed to provide general data to the media to assist in promotion of OSH. This will be done with regard to privacy and security of the individual records held in trust by the Institute of Occupational Health and other stakeholders.

It should be noted that although the Institute of Occupational Health can forward completed claims electronically to the Health Insurance Funds and the Pension and Disability Insurance Fund this extended process is subject to acceptance and demand by those funds at this stage.

(2) Report form

The new reporting process has two report forms. First, the employer's report requires 49 fields (although there are 43 listed fields there are a six fields with two sections).

Table 2.4 Structure of the employer's report form in the new system

Data group heading	Fields
I. Data on employer	6
II. Data on injured employee	14
III. Data on work related injury	23
IV. Data on witness	2
V. Data on person appointed to be responsible for safety and health	2
Signature block	2
Total fields	49

Second, the medical officer's report requires 26 fields to be completed including three in the signature block.

Table 2.5 Structure of medical officer's report form in the new system

Data group heading	Fields
I. Data on injured employee	5
II. Medical doctor who first examined employee	2
III. Medical doctor who completed the report on the injuries	2
IV. Nature and location of injury (nature and code of diagnosis according to ICD, from severe to minor)	3
V. External causes of injuries (nature and code of diagnosis according to ICD)	11
Medical centre signature block	3
Total fields	26

Whilst the new form contains only five fields less than the current form it is much more efficient to complete. The new form has auto links to the primary health care information system in order to auto-fill the employee data fields.

Almost all of medical officer and employer fields contain "drop down" menus. This feature has been included so that standardised data fields will result in consistent data in the database and the "free text" options are now almost non-existent. The drop down menus are based on the following international standards:

- International Standard Industrial Classification of all Economic Activities;
- International Standard Classification of Occupation [ISCO 88];
- European Classification of Economic Activities (NACE); and
- European Statistics on Accidents at Work (ESAW).

The extent of the level of compliance with the international standards cannot be determined without a detailed study of the drop down menus on the form and their relevance to the current situation in Serbia. It is reasonable to expect that some assistance will be required to

allow employers to maximise the inputs in the form. The majority of the fields are mandatory and the electronic version of the form cannot be completed without completing all of the critical fields.

In addition to the normal range of items in the International Standards, the new work injury reporting system has included a range of additional questions in order to establish more information about work injuries in Serbia. At this point a detailed assessment on this strategy cannot be made without further analysis of what other options may be used to obtain this additional information.

(3) Concluding remarks

As a result of the initial assessments of the work injury report system, the following remarks are made:

- The new system is mostly an electronic system which will increase efficiency and timeliness of processing. The complexity is minimized due to extensive use of “drop down” menus with fixed options which also improves standardization of data. At the same time, since not all employers are familiar with the use of electronic systems, forms should be available both in electronic and printed forms.
- While key inputs come from the examining medical officers and the employers, the new system enables a more rigorous assessment process for claims through involvement of the Labour Inspectorate and the Medical Commissions.
- As the system is web-based, it is easily accessible across Serbia. Commonly accessible database can form the basis of the statistical and information systems to all stakeholders. For the development of the statistical reporting system, stakeholder requirements need to be sought. The system also has a potential for expansion to include reporting of all accidents and integration with the proposed health management systems.
- The new reporting system is critical for improving the data collection. The new system has a capacity to produce “on demand” statistics for special initiatives. In particular, the new system enables the government authorities to design more effective reduction strategies and carry out a more accurate cost estimation of work accidents and occupational diseases. For these purposes, it is essential that the accident data are classified by industry.
- Although an open source software is used for the database software at minimal cost, the costs for development of the system have been borne substantially by the Ministry of Health. A forward cost assessment needs to be completed in order to identify the funding requirement to fully implement the system and its on-going management costs.
- For further development, the help desk function is critical to the user acceptance and efficient operation of the system. This will be more critical in the environment when the

- number of smaller employers use the system, particularly in providing technical assistance in the setup and help in operation of their system.
- There is a single controlling agency, though the key agency is yet to be legislated. For the management of records in the new system, effective monitoring and intervention by the Institute of Occupational Health is essential to mitigate the risks of long delays in processing.
- It has been reported that the user acceptance is high especially amongst medical officers. The ILO is committed to assist in extending the training to medical officers all across Serbia.

3. Estimation of the contribution rates for employment injury benefits

This chapter identifies the contribution rate necessary to finance employment injury benefits and presents further variants of contribution rating systems. This provides an important piece of information because there are no earmarked contributions for financing employment injury benefits in Serbia.

3.1 Estimation of the average contribution rate

The current Serbian employment injury insurance system *de facto* adopts pay-as-you-go (PAYG) financing with a uniform rate. Under the PAYG financing system the benefits expenditure is met by current contributions and no significant fund is set aside in advance. In order to collect contributions sufficient to cover all current and future costs related to claims occurring in any year, a widely adopted financing system for employment injury insurance consists of applying the PAYG for short-term benefits (temporary incapacity benefits, medical care and rehabilitation programmes) and the full-funding for long-term benefits (permanent disability and survivors' pensions). In particular, the terminal funding financial system is normally used to finance the long-term benefits. Under this system, in the year the pension is awarded a contribution equal to the actuarially assessed present value of pensions is set aside as a reserve for the future pension payments. With a view to enhancing fairness and equity of the system, it is recommended that Serbia should consider the adoption of the full-funding financial system, at least for the long-term benefits.

The contribution rate is set equal to the sum of the expected benefit costs and expected administrative expenses expressed as a percentage of the expected insurable earnings. Under the recommended financial system, the scope of the benefit costs to be met by the contributions in a given year covers the following:

- the medical care and rehabilitation services paid in the year;
- the temporary incapacity benefits (except for the first 30 days) paid in the year;
- the *present value* of permanent disability pensions awarded in the year;
- the *present value* of survivors' pensions awarded in the year;
- the *present value* of bodily impairment benefits awarded in the year;
- the care and assistance compensation paid in the year; and
- the funeral grants paid in the year.

In addition, the long-term liability with respect to the current beneficiaries of disability and survivors' pensions and bodily impairment benefits should be financed separately. In view of the fact that the Pension and Disability Insurance Fund has been in deficit, the implications of the transition costs should be recognized.

The contribution rate has been estimated under two sets of assumptions. The base assumption represents the status quo estimate based on past experience. The alternative assumption takes into account the reduction of under-reporting of cases through improvement in the reporting.

Table 3.1 presents the preliminary results of estimated average contribution rates of the employment injury system in Serbia.¹⁶ The contribution rates are presented separately for the Health Insurance Fund and for the Pension and Disability Insurance Fund.

Table 3.1 Preliminary estimates of the average contribution rates of the employment injury system in Serbia

(As a % of insurable earnings)

Contribution rate	Option A (recommended)		Option B (full PAYG) (Base)
	Base	Alternative	
Health Insurance Fund	0.46	0.67	0.46
Pension and Disability Insurance Fund	0.63	0.71	0.67
Total	1.09	1.38	1.13

Source: ILO estimation.

Either result accounts for a small portion of the employers' total social security contribution rate. The following remarks should be made.

- Option A is the recommended system, which combines PAYG for short-term benefits and terminal funding for long-term benefits. The estimated average contribution rate for employment injury benefits is 1.09 percent under the base assumption and 1.38 percent under the alternative assumption. It should be noted that the long-term liability for current beneficiaries is financed by a constant contribution rate over a 25-year amortization period.
- Option B presents the contribution rates under the PAYG financing system in the base case scenario. It should be noted that the resulting contribution rate under Option B, estimated at 1.13 percent, turned out to be higher than the rate under Option A. This is due to the large magnitude of the liabilities for current beneficiaries who were awarded pensions in the past.¹⁷

The contribution rates should be reviewed on a continual basis by taking into account the most recent experiences of incidence and severity of work accidents and occupational diseases. It is recommended that in the next review all assumptions should be carefully revised based on further analysis of the data in order to ensure their reliability and completeness.

3.2 Differential contribution rates by industry

Given that the employment injury risk varies widely by economic activity, employers may be classified into groups according to their risk characteristics and a risk-based contribution rate can be applied for each group of employers. Under the differential rating system, each risk

¹⁶ Annex A describes the process of the actuarial estimation of contribution rates.

¹⁷ In view of this observation, if one assumes that the bodily impairment benefits are financed by PAYG while disability and survivors' pensions are financed by terminal funding, then the resulting contribution rate is 1.14 percent under the base scenario.

group is considered as an autonomous financial unit. The results are usually presented in terms of the relative risk coefficients which represent the degree of risk of each rate group in relation to the average risk.

Due to the recent change in the IT system in the social security organizations in Serbia, information on work accidents by industrial sector is no longer available. This made it impossible to estimate the contribution rates separately for each risk group. Therefore, in this report, the emphasis is given on the methods and process for the determination of contribution rates.

The statistical classification of economic activities in the European Community, called NACE¹⁸ Rev. 2, is used by the Statistical Office of Serbia. Therefore, it would be reasonable to use it as a base to elaborate the classification system for employment injury contribution rate setting.

Table 3.2 presents the number of enterprises and employees for 12 industry classifications in Serbia. Note that this table does not include data on the agriculture, forestry and fishing sector.

Table 3.2 Number of enterprises and employees by industry in Serbia, 2010

	Enterprises		Employees	
	Number	Share	Number	Share
Mining and quarrying	313	0.4%	22,769	2.2%
Manufacturing	17,282	20.6%	345,719	33.7%
Electricity, gas, steam and air conditioning supply	311	0.4%	28,387	2.8%
Water supply; sewerage, waste management and remediation activities	714	0.9%	36,023	3.5%
Construction	7,142	8.5%	86,768	8.5%
Wholesale and retail trade; repair of motor vehicles and motorcycles	33,860	40.4%	231,045	22.5%
Transportation and storage	4,744	5.7%	97,577	9.5%
Accommodation and food service activities	2,254	2.7%	23,734	2.3%
Information and communication	3,760	4.5%	46,305	4.5%
Real estate activities	710	0.8%	3,572	0.3%
Professional, scientific and technical activities	10,007	11.9%	58,861	5.7%
Administrative and support service activities	2,690	3.2%	44,036	4.3%
Total	83,787	100.0%	1,024,796	100.0%

Source: Statistical Office of the Republic of Serbia, Statistical Yearbook 2012.

¹⁸ NACE is the acronym for “Nomenclature statistique des activités économiques dans la Communauté européenne”. Its hierarchical structure is composed of 21 sections, 88 divisions, 272 groups and 615 classes.

The industrial grouping in the above table provides a first step towards establishing relative risk coefficients. With a view to refining these classifications, the possibility of subdivision of certain sectors is investigated. The risk classification of employers must achieve optimal balance between conflicting objectives of equity and statistical credibility.

3.3 The experience rating system

The exposure to risk within the same economic activity can differ between enterprises because of different standards of safety conditions at the enterprise level. Prevention activities and the commitment of employers and workers to the early return to work of injured workers will also have an impact on the experience of individual employers.

Experience rating is intended to serve as an incentive for employers to reduce both the number of workers injured and the length of lost time by encouraging the employer to establish and maintain safety and prevention programmes and to assist the worker to return to work as early as possible.

Under the experience rating system (also referred to as the merit rating or “bonus-malus” premium system), the contribution rate of an individual employer is adjusted according to the accident experience and the accident prevention measures taken by the employers.

Adjustments of the contribution rate can be made prospectively or retrospectively. Under the prospective approach future contribution rates are adjusted through discounts or surcharges according to the past experience of the employers in comparison with that of their industry risk group. Although employers’ contribution rates must be responsive to experience, the magnitude of discounts and surcharges must bear a reasonable relationship to employers’ experience variations, taking into consideration their size.¹⁹

Under the retrospective approach, on the other hand, each employer pays the contribution rate set for their industry in the first place. After a certain period following the end of the year, retrospective refunds or surcharges are made based on the employer’s actual claims. In order to avoid excessive differences between the initial contribution rate and the final charges, an appropriate insurance mechanism must be included in the design of the rating system. Retrospective plans based on experience may be restricted to establishments over a certain size.

Experience rating systems require reliable databases pertaining to each employer and advanced tools for the billing of individual employers. They also generate the need for more or better-trained staff in the administrative body, which means higher administrative costs for the system. In theory, a more sophisticated system can entail better incentives for prevention and an increased number of workers returning to work, although the costs of administering the system will be higher. However, if higher administrative costs can be offset by a reduction in the total cost of employment injuries, then the experience rating system can be considered appropriate. This trade-off is not automatic and in order to achieve the desired

¹⁹ The range of variation of contribution rates differs by country. As explained in Annex B, in the Japanese system, the contribution rates are adjusted within the range of 40 percent in general cases. However, the maximum range of adjustment is 35 percent for the forestry sector, and 30 percent for construction projects. In Quebec, there is an upper limit at 3 times for surcharge, but no limit for discount.

result, the policy and its implementing strategy need to be carefully designed in view of the country's administrative capacity.

Table 3.3 presents the number of enterprises by size. Provided that small and micro-sized employers will be excluded as their statistical credibility is too low, it is assumed that the scope of the experience rating covers all large and medium-sized enterprises as well as certain small enterprises classified in high risk groups. From this table, it is estimated that at least 3 percent of the total number of enterprises, or at least 60 percent of the total employees can be subject to experience rating. By industry, the number of large and medium-sized enterprises is relatively high in manufacturing, construction, and wholesale and retail trade.

Table 3.3 Number of enterprises by industry and size in Serbia, 2010

	Large (250 or more employees)	Medium (50-249 employees)	Small (10-49 employees)	Micro (0-9 employees)	Total
Mining and quarrying	9	20	40	244	313
Manufacturing	234	894	2,668	13,486	17,282
Electricity, gas, steam and air conditioning supply	15	27	38	231	311
Water supply; sewerage, waste management and remediation activities	31	120	132	431	714
Construction	54	217	895	5,976	7,142
Wholesale and retail trade; repair of motor vehicles and motorcycles	68	422	2,753	30,617	33,860
Transportation and storage	34	101	565	4,044	4,744
Accommodation and food service activities	7	77	334	1,836	2,254
Information and communication	17	64	414	3,265	3,760
Real estate activities	1	6	42	661	710
Professional, scientific and technical activities	8	117	867	9,015	10,007
Administrative and support service activities	31	64	210	2,385	2,690
Total	509	2,129	8,958	72,191	83,787
Distribution of enterprises	0.6%	2.5%	10.7%	86.2%	100.0%
Distribution of employees	40.3%	21.8%	17.7%	20.2%	100.0%

Source: Statistical Office of the Republic of Serbia, Statistical Yearbook 2012.

In designing and implementing an experience rating system for Serbia, the following conditions should be met in order for the rating system to achieve its aim of reducing employment injuries and hence improving safety and health at the workplace.

- First, the experience rating system requires detailed data by individual employers which are currently unavailable in Serbia. Given under-reporting on work accidents and lack of notification of occupational diseases, the lack of a reliable database is a particular problem with employment injury insurance. Thus, a solid database of employment injuries will need to be developed as a prerequisite for the implementation of the experience rating system and also for improving the industry rating system.
- Second, the capacity of the government and social security organizations should be built to implement the experience rating system efficiently. At the same time, employers and workers should be adequately informed of the implementation of the experience rating system and its impact on their future contribution rates.
- Third, the implementation of an experience rating system requires a set of rules. For example, provisions are needed to prevent avoidance of surcharges by employers through closures and reopening of enterprises under a different legal umbrella. Certain types of claims such as long latency occupational diseases deserve special attention in their use for individual rate purposes and adequate rules must be put in place. It is also well known that the success of experience rating is strongly related to the ability of the authorities to enforce the rules regarding the reporting of injuries.
- Fourth, as a large majority of small enterprises and all micro enterprises (which account for 97 percent of enterprises in Serbia) as well as self-employed workers are not eligible to receive the financial incentive through the experience rating system, other measures would need to be put in place to extend preventative measures to cover all workplaces, which can possibly be subsidized from the contributions or the state budget.

4. Conclusion

Over the course of the ILO technical assistance on employment injury protection for Serbia, major problems have been identified and options have been formulated on the recommended actions. This chapter summarizes the key recommendations and outlines their implementation strategies.

4.1 Summary of recommendations

(1) Amendment of the current system in conformity with international standards

The current employment injury protection system in Serbia needs to be amended in order to fully conform to the general principles of international standards, in particular the Employment Injury Benefits Convention, 1964 (No. 121) which Serbia has ratified since 2000.

- First, in view of the principle that cash benefits should be financed by insurance or taxation, the temporary incapacity benefits (salary benefits) due to work-related causes (except for the first 30 days) as well as vocational rehabilitation should be transformed from direct employer liability into social insurance benefits, possibly by incorporation into a suitable existing social insurance system.²⁰ If the compliance with work accident reporting is improved, it is expected that the employers would prefer to cover employment injury benefits by social insurance rather than their direct liability. The necessary contribution rate for financing the temporary incapacity benefits is estimated at 0.17 percent under the base assumption.²¹
- Second, in view of the principle that the costs of employment injuries are to be financed exclusively by employers, the current equal sharing of contribution rates between employers and workers should be revised. Under the current system, the average contribution rate for employment injury benefits (including temporary incapacity benefits) is estimated at 0.46 percent for the Health Insurance Fund and at 0.63 percent for the Pension and Disability Insurance Fund. If these contribution rates are earmarked for the employers, and the remainder is divided equally between employers and workers, the total contribution rate for the Health Insurance Fund, currently at 12.3 percent,²² should be shared 6.4 percent by employers and 5.9 percent by workers, and the total contribution rate for the Pension and Disability Insurance Fund, currently at 24 percent, should be shared 12.3 percent by employers and 11.7 percent by workers.

²⁰ It should be noted that the Employment Injury Benefits Convention No.121 mandates that the benefit level must attain 60 percent of the reference wage for a standard beneficiary (a male worker with a wife and two children).

²¹ Since it is assumed that the scope of the benefits covers the work-related temporary incapacity benefits, the contribution rate for the Health Insurance Fund should be increased accordingly. However, it is expected that a large part of the additional work-related temporary incapacity benefits would be offset by the reduction in the non work-related temporary incapacity benefits.

²² In view of the previous footnote, no additional contribution rate is assumed.

(2) Improvement of reporting of work injuries and occupational diseases

The lack of comprehensive knowledge on work accidents and occupational diseases is a fundamental weakness in the current employment injury protection and occupational safety and health in Serbia. As a result, significant under-reporting hampers the effective prevention policies and the creation of a more equitable compensation system.

Priority action should be given to improving the current system of notification and recording of work accidents and occupational diseases. In this regard, the Government of Serbia has been developing a new IT system for the reporting of work injuries and occupational diseases. The new system is expected to improve the reporting of work injuries and build a more comprehensive knowledge base. The ILO will assist the process of replicating the pilot project throughout the country through a series of training sessions at the local hospitals. It will also closely monitor the progress of implementation and provide recommendations for further improvement based on technical assessments.

At the same time, the technical capacity of labour inspectors should be strengthened to provide integrated services and conduct more safety inspections with the available resources. It is recommended that the percentage of inspection of severe accidents should be increased from the current 30 percent to at least 50 percent. Particular attention should be paid to small and medium-sized enterprises.

(3) Synergy between prevention and compensation

For better occupational risk management, the relevant stakeholders should promote the synergy between prevention and compensation. In Serbia, occupational risk management is undertaken by different institutions as a part of their jurisdiction, including the OSH Directorate, the Labour Inspectorate, the Health Insurance Fund, and the Pension and Disability Insurance Fund. In view of the mutual benefit from an integrated approach, closer coordination between various institutions is required.

This view is also recognized by the Law on Occupational Safety and Health of Serbia. Article 52 of the Law states that “Employers, trade unions, insurance companies, organizations authorized for health and pension and disability insurance shall be liable to cooperate in adopting common views on issues concerning promotion of safety and health at work, as well as to take care about development and promotion of the general culture regarding safety and health at work, in accordance with this Law”.

To achieve a more transparent link between contributions and expenditure on employment injury benefits, the following two options of risk-based contributions have been explored. These measures should be considered as a medium-term goal which should be implemented after the improved reporting system is in place.

- First, it is proposed to introduce differential contribution rates which reflect the risk of industries. The statistical classification of economic activities in the European Community (NACE Rev. 2) can provide a reasonable base for the grouping of employers. Due to the lack of employment injury benefits data by industry, it is not possible to estimate the industrial contribution rates. Thus this measure can be implemented after the database based on the new reporting system is fully operational.

- Second, as a measure to provide incentives for employers' commitment to prevention of employment injuries and collaboration for facilitating injured workers' early return to the work, experience rating can be considered. It would be possible to design a prospective experience rating system for medium and large enterprises that meet the statistical credibility criterion and certain small enterprises in high risk groups. It is estimated that at least 3 percent of the total number of enterprises, or at least 60 percent of the total employees can be subject to experience rating. This should be supplemented by other incentive measures that extend preventative measures to cover all workplaces, including small and micro enterprises as well as the workplaces of the self-employed. The experience rating system requires reliable databases with respect to individual employers and requires higher administrative expenses. Again, the prerequisite is that the reporting system functions well.

(4) Remarks on the institutional aspects

Concerning the organizational set-up for the implementation of the new system, the first ILO report²³ formulated the following three options based on international experience.

- The first option is to operate in the current institutional framework with improved coordination between the Health Insurance Fund and the Pension and Disability Insurance Fund. Countries adopting this type of structure include Greece, Hungary and Estonia.
- The second option is to create an employment injury "branch" under the Health Insurance Fund or under the Pension and Disability Insurance Fund. The implementation can be made in a phased manner to achieve first integrated contributions management and then gradually administer the benefit payments from a single institution. Examples include France (under the health insurance); Poland and Bulgaria (under the general social insurance scheme).
- The third option is to establish an autonomous institution for employment injury projection. Examples include Italy and Switzerland (a single institution); Germany and Austria (multiple industry-based institutions and an umbrella organization).

The key national stakeholders should make a strategic decision, taking into account the advantages and disadvantages of each option, with respect to the governance structure as well as administrative and cost efficiencies.²⁴ It should also be noted that the institutional structure of national employment injury insurance systems depends on the historical context of the country concerned, as indicated in the examples above. Thus, careful consideration has to be given to designing an implementation strategy which enables a smooth transition from the current to the desired organizational arrangements.

²³ ILO. 2012. *Employment Injury Protection in Serbia: Issues and Options* (Budapest).

²⁴ For detail, reference should be made to the first ILO report.

4.2 The way forward

All the tripartite stakeholders in Serbia have generally agreed on the need for improvement in employment injury protection and have supported a proactive approach focusing on the prevention of work accidents and occupational diseases.

A tripartite Working Group on the insurance against work accidents and occupational diseases was established in 2013 to coordinate the development of the employment injury insurance policy and system in Serbia. Its task includes the development of a draft Law. In general, the development and implementation of a social security law require strong commitment and continuous efforts of the key stakeholders. The Working Group should effectively lead and manage the policymaking process through a well-informed and participatory policy dialogue between key tripartite stakeholders.

It is hoped that key findings and recommendations formulated in the two ILO reports will be considered as the basis for the development of the Serbian employment injury protection system which meets the principles mandated by international labour standards.

The ILO stands ready to provide further technical assistance within the framework of the Decent Work Country Programme for Serbia. In particular, it would be prepared to provide comments on the draft Law and further technical assistance and capacity building for an effective implementation of the prospective Law.

Annex A Actuarial estimation of the average contribution rates

This Annex provides an illustration of the process of estimating the average contribution rate applicable for 2014 based on the available data of the period 2010-2012 in Serbia.

The quality of cost estimates depends upon the quality of the data that are available. To analyze the past experience and establish the assumptions with confidence, a complete database is necessary. In case a full set of data is not available, one must use simplified or indirect estimation methods. It should be noted that assumptions are not predictions of what will happen, but a reasonable basis to make projections of future outcomes. Observed results unavoidably deviate from the estimation and appropriate actions should be taken when surpluses or deficits occur.

A.1 Data and assumptions

(1) Number of insured workers

Table A.1 presents the number of active contributors to the Health Insurance Fund (HI Fund) for the period 2010-2012. Due probably to the global crisis, the number of insured persons shows a decreasing trend. It has been assumed that the number of insured persons would be 1,800,000 for 2014. The Table also shows the number of insured persons of the Pension and Disability Insurance Fund (PIO Fund). For the purpose of cost estimation, the same number of insured persons has been assumed for the HI Fund and the PIO Fund.

Table A.1 Active contributors to the Health Insurance Fund in Serbia, 2010-2012

	2010	2011	2012
Employed by enterprises	1,637,596	1,637,735	1,616,775
Entrepreneurs and individuals	145,388	142,388	139,997
Unemployed	43,060	42,513	48,636
Others	6,507	6,248	6,839
Total	1,834,561	1,830,895	1,814,259
Number of insured persons of the PIO Fund	2,067,149	1,774,448	n.a.

Source: HI Fund. PIO Fund

Table A.2 presents the economically active population in the labour market in Serbia. The number of employees contributing to the HI Fund is consistent with the number of employees in the labour market. However, the number of entrepreneurs and individuals contributing to the HI Fund account for less than 30 percent of the self-employed in the labour market data. This discrepancy suggests that a majority of self-employed do not contribute to the HI Fund or to the PIO Fund.

Table A.2 Economically active population in Serbia, 2011

	Status	Number of persons
A	Employees	1,574,943
B	Self-employed (C + D)	499,137
C	Self-employed with employees	88,078
D	Self-employed without employees	411,058
E	Family workers (F + G)	179,129
F	In agriculture	163,143
G	In other activities	15,986
H	Employed (A + B + C)	2,253,209
I	Unemployed	671,143
J	Economically active population (H + I)	2,924,352

Source: Statistical Office of the Republic of Serbia, Statistical Yearbook 2012. Tables 3.4, 3.8.

(2) Insurable earnings

Data on insurable earnings are not directly available, but they can be estimated from the financial data regarding contribution income. In Table A.3, the insurable earnings are estimated by dividing the contribution income for each fund by the respective contribution rate, and the average insurable earnings is calculated from the total insurable earnings and the number of insured persons.

Table A.3 Estimation of the average insurable earnings, 2009-2011

	HI Fund			PIO Fund		
	Contributions (million RSD)	Estimated insurable earnings (million RSD)	Average insurable earnings (RSD, monthly)	Contributions (million RSD)	Estimated insurable earnings (million RSD)	Average insurable earnings (RSD, monthly)
2009	123,009	1,000,073	n.a.	235,818	1,071,900	n.a.
2010	127,183	1,034,008	46,969	262,557	1,193,441	48,111
2011	136,116	1,106,634	50,369	268,067	1,218,416	57,224

Source: Social security contributions extracted from Statistical Yearbook 2012, Statistical Office of the Republic of Serbia. Table 6.17. Insurable earnings and average insurable earnings estimated by ILO.

The estimated insurable earnings are comparable with the employees' wages and salaries in the national accounts.

Table A.4 presents data on the national average wages. It is observed that the average insurable earnings of HI Fund contributors follow the same trend as the gross national average wage. By assuming a 6 percent annual rate of increase, the gross national average wage for 2014 has been estimated at 60,000 RSD per month.

The density is defined as a percentage of the average insurable earnings with respect to the gross national average wage. Based on the past data, the density has been assumed at 100 percent for the purpose of estimation.

Table A.4 National average wages in Serbia, 2008-2011

Year	(RSD, monthly)	
	Gross	Net
2008	45,674	32,746
2009	44,147	31,733
2010	47,450	34,142
2011	52,733	37,976

Source: Statistical Yearbook 2012, Statistical Office of the Republic of Serbia. Table 3.18.

(3) Temporary incapacity benefits

For the cost estimation of temporary incapacity benefits, assumptions regarding the incidence rate and the average duration of benefits are necessary.

Table A.5 presents data provided by the HI Fund on the number of work injuries. The decrease in the number of reported cases in 2011 and 2012 is due to the amendment of the Health Insurance Law which excludes commuting accidents from work injuries. Recently, however, the Constitutional Court has overruled this amendment. Thus, 2010 figures are a better indication of expected incidence for the future.

Table A.5 Number of work injuries in Serbia, 2010-2012

	2010	2011	2012
Light injuries	18,874	16,286	13,093
Severe injuries	3,551	3,375	2,711
Fatal (death on work site and at hospital)	56	56	39
Total	22,481	19,717	15,843
Incidence of non fatal injuries per 100 workers	1.22	1.07	0.87
Incidence of fatal injuries per 1000 workers	0.031	0.031	0.021
Percentage of severe injuries in non-fatal injuries	16%	17%	17%

Source: HI Fund data regarding injuries. ILO calculation.

Table A.6 compares the estimated incidence rates of work injury of seven countries. As can be seen from the table, Serbia exhibits lower incidence rates of non-fatal injuries than most countries. This provides evidence of under-reporting of work accidents, especially light injuries, in Serbia.

It should be noted that these countries use different bases of incidence rates. For example, Germany defines the incidence rates as the number of injured workers as a percentage of the full-time equivalent workers. However, in terms of the average number of insured workers, Germany's incidence rate would be 1.63 per 100 workers. In addition, countries used different criteria regarding the work injury. Some countries require at least three lost days while others do not apply any minimum period.

Table A.6 Number of injured workers per 100 workers in selected countries, 2010

Serbia	Canada	France	Germany	Portugal	Thailand (2009)	Trinidad and Tobago
1.22	1.76	3.60	2.58	3.63	0.53	0.48

Source: Data extracted from annual reports published by institutions.

Only fragmented data were available concerning the average duration of temporary incapacity benefits in Serbia. Hence it was estimated by making reference to international experiences. Table A.7 presents the average duration of temporary incapacity benefits in Canada, France and Portugal (France's data is not on the same basis as Canada and Portugal). It should be noted that Canada and France have no limit on the duration of benefits and Portugal pays up to one year, while Serbia pays up to six months.

Table A.7 Average duration of temporary incapacity benefits in selected countries, 2010

(In days)		
Canada	France	Portugal
79	56	41

Source: Canada: <https://aoc.awcbc.org/KsmReporting/ReportDataConfig>
 France: <http://www.risquesprofessionnels.ameli.fr/statistiques-et-analyse/sinistralite-atmp.html>
 Portugal : Gabinete de Estratégias e Planeamento, Estatísticas em síntese, Acidentes de Trabalho 2010
 ILO calculation.

For the purpose of cost estimation, the base scenario assumes the incidence rate at 1.54 percent and the duration at 40 days. The alternative scenario, which considers an improved reporting of work accidents, assumes a higher incidence rate at 2.66 percent in view of the experiences of Canada, France, Germany and Portugal. The alternative scenario assumes 33 days benefit duration by taking into consideration that the proportion of light injuries is expected to increase as a result of improved work accident reporting.

(4) Medical care and rehabilitation benefits

No data were available on the expenditure for medical care and rehabilitation services with respect to work injuries and occupational diseases. For the specification of the medical care costs related to employment injury, it is strongly recommended that the HI Fund undertake separate accounting of medical care costs due to work-related causes and general causes.

To make an indirect estimate, reference has been made to the experience of other countries. In Canada, the cost of medical care and rehabilitation benefits has varied between 65 percent and 80 percent of the cost of temporary incapacity benefits during the last decade. It should be noted that the experiences of individual countries depend on several factors such as the industry composition and the supply and cost of services. For the cost estimation, by taking into account the under-reporting and the costs directly paid by employers, the cost of medical care and rehabilitation services has been assumed to be 150 percent of the cost of temporary incapacity benefits under the base scenario and 155 percent under the alternative scenario.

(5) Permanent disability pensions

The cost estimation of permanent disability benefits requires the establishment of assumptions regarding the incidence rate and the average benefit by degree of disability. For the determination of the average benefit, information on the salaries and the distribution of injured workers by gender and age is necessary. Also, for the calculation of the present values of pensions, assumptions regarding mortality rates and economic variables such as inflation and interest rates need to be established.

It can be assumed that a certain proportion of temporary incapacity cases progress into permanent disability. As seen from Table A.8, the number of severe injuries accounts for 17 percent of non-fatal injuries and the newly awarded permanent disability pensions (for work-related causes) represents about only 0.6 percent of non-fatal injuries. It should be noted that only one-third of severe work accidents is investigated by the Labour Inspectorate.

Table A.8 Data on permanent disability pensions in Serbia, 2010-2012

		2010	2011	2012
A	Total non-fatal injuries	22,425	19,661	15,804
B	Of which: Severe injuries	3,551	3,375	2,711
C	Newly awarded permanent disability pensions (work-related)	n.a.	115	95
D	Newly awarded permanent disability pensions as a percent of non-fatal injuries (C/A)	-	0.58%	0.60%
E	Percentage of severe injuries in non-fatal injuries (B/A)	16%	17%	17%

Source: HI Fund. PIO Fund. ILO calculation.

For international comparison, Table A.9 provides data on permanent disability in Canada, France and Germany. Despite the different basis used for the determination of permanent disability cases among these countries, these data suggest that around 2 percent of temporary incapacity would result in long-term loss of earning capacity irrespective of the degree of loss of earning capacity. Although the Serbian system provides permanent disability pensions only for total loss of capacity to work, the tendency of under-reporting and low coverage of labour inspection suggest that a certain number of work-related disability pensions are claimed as general disability pensions.

Table A.9 Data on permanent disability in selected countries, 2010

	Description of the benchmark of permanent disability	Percentage of permanent disability in non-fatal injuries with lost days
Canada	Percentage of lost-time claims receiving wage-loss benefits at the end of the 6th year after the injury year	2.4%
France	Disability greater than 10 percent	2.1%
Germany	Disability greater than 20 percent	1.7%

Source: Canada: <https://aoc.awcbc.org/KsmReporting/ReportDataConfig>
 France: <http://www.risquesprofessionnels.ameli.fr/statistiques-et-analyse/sinistralite-atmp.html>
 Germany: http://www.dguv.de/content/facts_figures/index.jsp

As the observed incidence rates of permanent disability in Serbia are generally low, year-to-year fluctuations in any given system may be significant. For the purpose of cost estimation,

by taking into consideration the Serbian and international experiences, it has been assumed that 1.25 percent of temporary incapacity claims would result in a permanent disability pension under the base scenario. The degree of disability is assumed to be 100 percent. Under the alternative scenario, the incidence rate has been increased by 50 percent.

With respect to the calculation of present values, mortality rates corresponding to the life expectancies in Serbia have been used with an adjustment to take into account shorter life expectancy. In addition, a real discount rate of 4 percent has been assumed. Specifically, the average age of the pensioners at the occurrence of invalidity has been assumed at 40 years, and the resulting present value is estimated to be 192 for one currency unit of the monthly benefits.

(6) Benefits for bodily impairment and for care and assistance

In addition to the permanent disability pensions, the PIO Fund provides bodily impairment benefits to injured workers suffering severe damage to organs irrespective of whether the consequence is a loss of earning capacity. It also provides cash compensation for persons who provide care for insured persons or pensioners who, due to injury or sickness, require constant attendance for their basic life needs. Table A.10 presents the number of those benefits.

Table A.10 Number of benefits for bodily impairment and for care and assistance in Serbia, 2008-2011

Year	2008	2009	2010	2011
Bodily impairment	98,352	92,720	87,246	82,930
Care and assistance	58,374	60,935	61,407	61,893

Source: Statistical Yearbook 2012, Statistical Office of the Republic of Serbia. Table 4.8.

For the period 2008-2011, the number of bodily impairment benefits has been decreasing steadily, while the number of care and assistance benefits has been increasing. These contrasting trends require further investigation. For the purpose of cost estimation, the incidence rate of bodily impairment benefits has been assumed four times higher than permanent disability pensions, while the same mortality rates as those of permanent disability pensioners have been that of assumed. The average loss of work capacity has been assumed to be 50 percent.

The cost of care and assistance benefits has been estimated by the number of beneficiaries and the average benefit. It has been assumed that 5 percent of the total beneficiaries are work-related. The average benefit has been assumed to be 15,500 RSD in 2014 prices.

(7) Survivors' benefits

The cost estimation of survivors' benefits requires the establishment of assumptions regarding the incidence rate of fatal cases and their average benefits. The determination of average benefits takes into consideration the salaries of the deceased and the survivors' profile. The deceased's age at accident is generally used as an indicator of the survivors' profile.

Table A.11 presents statistical data regarding the incidence of fatal cases in Serbia and selected countries.

Table A.11 Fatal cases due to employment injury per 1000 workers in selected countries, 2011

Serbia	Canada	France	Germany (2010)	Portugal (2010)	Thailand (2009)	Trinidad and Tobago (2010)
0.031	0.024	0.030	0.014	0.050	0.075	0.014

Source: Serbia: HI Fund. Other countries: data extracted from annual reports published by institutions.

For the purpose of cost estimation, the incidence rate of fatal cases has been assumed to be 0.035 per thousand based on the Serbian experience (See Table A.5).

In the absence of information on the demographic profile of the survivors in Serbia, conservative assumptions have been made based on international experience. Specifically, the probability of having a spouse is assumed to be 80 percent; the average age of the spouse has been assumed at 40 years; and the resulting present value is estimated to be 216 for one currency unit of the monthly benefits. Regarding orphans, the average number of children is assumed to be 1.8; the average age of the youngest children has been assumed at 9 years; and the resulting present value is estimated to be 108 for one currency unit of the monthly benefits. With respect to the calculation of present values for spouses, mortality rates corresponding to the life expectancies in Serbia have been used. The termination rates of orphans have been set at 0 until 18 years of age and 0.5 from 19 years until 26 years of age. A real discount rate of 4 percent has been assumed.

The cost of funeral grants has been estimated by using the same incidence rate of fatal cases and the unit amount equal to 1.5 times the average monthly pension.

(8) Administrative expenses

Administrative expenses are usually expressed as a percentage of the benefit costs. The financial statements of the social security institutions in Serbia do not specify the administrative expenses regarding employment injury benefits.

For the purpose of the contribution estimation, it has been assumed that the administrative expenses are equal to 8 percent of the total benefit costs.

A.2 Estimation of the average contribution rates

The following table provides an illustration of the calculation of the average contribution rate under Option A by type of benefit according to the base data and assumptions.

Table A.12 Estimation of the average contribution rates under Option A

	Units	Base assumption	Alternative assumption
A. Insurable earnings			
(1)	Number of insured	1,80,000	1,80,000
(2)	Average monthly salary	RSD 60,000	60,000
(3)	Density	1.00	1.00
(4)	Expected insurable earnings (1) x (2) x (3) x 12	million RSD 1,296,000	1,296,000
B. Temporary incapacity benefits			
(5)	Incidence rate	0.0154	0.0266
(6)	Average monthly salary	RSD 60,000	60,000
(7)	Average number of days paid	40	33
(8)	Expected cost (1) x (5) x (6) / 30 x (7)	million RSD 2,218	3,160
(9)	Cost as a % of the insurable earnings (8) / (4) x 100	0.17	0.24
C. Medical care and rehabilitation			
(10)	Multiple of temporary incapacity benefits cost	1.50	1.55
(11)	Expected cost (8) x (10)	million RSD 3,326	4,898
(12)	Cost as a % of the insurable earnings (11) / (4) x 100	0.26	0.38
D. Permanent total disability pensions			
(13)	Incidence rate	0.000193	0.000289
(14)	Average monthly pension	RSD 28,000	28,000
(15)	Average present value per monthly unit of pension	192	192
(16)	Expected cost (1) x (13) x (14) x (15)	million RSD 1,868	2,797
(17)	Cost as a % of the insurable earnings (16) / (4) x 100	0.14	0.22
E. Bodily impairment benefits			
(18)	Incidence rate	0.000722	0.000722
(19)	Average monthly benefit for 100%	RSD 6,000	6,000
(20)	Average degree of disability	0.5	0.5
(21)	Average present value per monthly unit of pension	192	192
(22)	Expected cost (1) x (18) x (19) x (20) x (21)	million RSD 800	800
(23)	Cost as a % of the insurable earnings (22) / (4) x 100	0.06	0.06
F. Survivors' pensions			
(24)	Incidence rate	0.000031	0.000031
(25)	Average monthly salary of the deceased	RSD 28,000	28,000
(26)	Probability of having a spouse	0.80	0.80
(27)	Average present value per monthly unit of pension to the spouse	216	216
(28)	Average number of children per deceased	1.8	1.8
(29)	Average present value per monthly unit of pension to orphans	108	108
(30)	Expected cost (1) x (24) x (25) x [(0.7 x (26) x (27)) + (0.1 x (28) x (29))]	million RSD 219.4	219.4

(31)	Cost as a % of the insurable earnings (30) / (4) x 100		0.02	0.02
G. Funeral grant				
(32)	Funeral grant	RSD	42,000	42,000
(33)	Expected cost (1) x (24) x (32)	million RSD	2.3	2.3
(34)	Cost as a % of the insurable earnings (33) / (4) x 100		0.0002	0.0002
H. Care and assistance				
(35)	Number of beneficiaries		3,850	3,850
(36)	Average amount	RSD	15,500	15,500
(37)	Expected cost (35) x (36) x 12	million RSD	716	716
(38)	Cost as a % of the insurable earnings (37) / (4) x 100		0.06	0.06
I. Total cost of benefits(as a % of the insurable earnings)				
(39)	HI fund (9) + (12)		0.43	0.62
(40)	PIO fund (17) + (23) + (31) + (34) + (38)		0.28	0.35
(41)	Total (39) + (40)		0.71	0.97
J. Administrative expenses				
(42)	Multiple of benefit cost		0.08	0.08
(43)	HI fund (as a % of the insurable earnings) (39) x (42)		0.03	0.05
(44)	PIO fund (as a % of the insurable earnings) (40) x (42)		0.02	0.03
(45)	Total (as a % of the insurable earnings) (43) + (44)		0.06	0.08
K. Amortization of current pensioners' liability (25 years)				
(46)	PIO fund (as a % of the insurable earnings)		0.33	0.33
L. Total contribution rate (as a % of the insurable earnings)				
(47)	HI fund (39)+(43)		0.46	0.67
(48)	PIO fund (40)+(44)		0.63	0.71
(49)	Total (47)+(48)		1.09	1.38

A.3 Estimation of the PAYG cost rates for long-term cash benefits

Under Option B, bodily impairment benefits and disability and survivors' pensions are financed by PAYG. The following table provides an illustration of the calculation of the PAYG contribution rate for these benefits under the base assumption.

Table A.13 Estimation of the PAYG cost rates for long-term cash benefits

	Units	Base assumption
A. Insurable earnings		
(4) Expected insurable earnings	million RSD	1,296,000
M. Permanent total disability pensions		
(50) Number of pensioners		7,700
(51) Average monthly pension	RSD	28,000
(52) Expected cost (50) x (51) x 12	million RSD	2,587
(53) Cost as a % of the insurable earnings (52) / (4) x 100		0.20
N. Bodily impairment benefits		
(54) Number of beneficiaries		80,000
(55) Average monthly benefit for 100%	RSD	6,000
(56) Average degree of disability		0.5
(57) Expected cost (54) x (55) x (56) x 12	million RSD	2,800
(58) Cost as a % of the insurable earnings (57) / (4) x 100		0.22
O. Survivors' pensions		
(59) Number of pensioners		8,500
(60) Expected cost	million RSD	1,874
(61) Cost as a % of the insurable earnings (60) / (4) x 100		0.14

A.4 Estimation of the liabilities concerning the existing beneficiaries of long-term cash benefits

Under Option A, the liabilities of the existing beneficiaries of bodily impairment benefits and disability and survivors' pensions are to be financed separately. The following table provides an illustration of the calculation of the PAYG contribution rate for these benefits.

In this estimation, the following assumptions have been made regarding the average present values. The average age of the current beneficiaries of disability pensions and bodily impairment benefits has been assumed to be 55 years and the resulting present value is estimated to be 170 for one currency unit of a monthly benefit. The average age of a spouse has been assumed to be 55 years and the resulting present value is estimated to be 194 for one currency unit of a monthly pension. The same assumptions have been made for orphans.

Table A.14 Estimation of the liabilities of the existing beneficiaries of long-term cash benefits

	Units	Base assumption
Permanent total disability pensions		
(a) Number of pensioners		7,700
(b) Average monthly pension	RSD	28,000
(c) Average present value per monthly unit of pension		170
(d) Liability	million RSD	36,652
Survivors' pensions		
(e) Number of pensioners		8,500
(f) Average monthly pension of the deceased	RSD	28,000
(g) Average present value per monthly unit of pension for the spouse		194
(h) Average present value per monthly unit of pension to orphans		108
(i) Liability (spouse)	million RSD	27,679
(j) Liability (orphans)	million RSD	1,460
(k) Liability (total)	million RSD	29,139
Bodily impairment benefits		
(l) Number of beneficiaries		80,000
(m) Average monthly benefit for 100%	RSD	6,000
(n) Average degree of disability		0.5
(o) Average present value per monthly unit of benefit		170
(p) Liability	million RSD	40,800
Total liabilities		
(q) Total liabilities	million RSD	106,591

Based on these estimates, the contribution rates necessary for financing these liabilities with respect to different amortization periods are calculated as follows.

Table A.15 Contribution rates for the liabilities of the existing beneficiaries of long-term cash benefits

	(as a % of the total insurable earnings)		
	20 years	25 years	30 years
Disability and survivors' pensions and bodily impairment benefits	0.41	0.33	0.27

Annex B Case studies on the contribution rating system

B.1 Japan

In Japan, the contribution rate of the Workers' Accident Compensation Insurance is set by industry. As of 2013, the contribution rate varies from 0.25 percent to 8.9 percent in 55 types of business undertaken by the employer. The contribution rate consists of the rate in respect of work-related benefits and the uniform rate in respect of commuting accidents, welfare schemes and administrative expenses (the uniform rate is currently 0.06 percent). The contribution rates are reviewed every three years based on the performance of the preceding three-year period.

To provide employers with incentives for accident prevention, an experience-based system (called the merit premium system) is implemented. Under this system, the contribution rate of an individual establishment can be adjusted upwards/downwards within the range of 40 percent (the maximum adjustment range is 35 percent for the forestry sector, and 30 percent for construction projects). The adjustment is applied only to the contribution rate in respect of work-related benefits.

The merit system is applied to establishments with more than 100 workers, establishments with 20 to 99 workers meeting certain statistical credibility conditions,²⁵ and construction projects whose value is more than 120 million Japanese yen (about one million euro).

Specifically, for each establishment, the ratio of total benefit payments to contributions over the most recent three years (called the "balance ratio") is calculated.

$$\text{Balance ratio} = \frac{\text{Sum of the benefit payments of the three preceding years}}{\text{Sum of the contributions of the three preceding years}}$$

If the balance ratio is less than 0.75, then the contribution rate (set by industry) is gradually reduced by up to 40 percent. On the contrary, if this ratio is more than 0.85, then the contribution rate is increased by up to 40 percent. The adjusted contribution rate is applied for the next fiscal year (e.g. if the period of balance ratio is 2010-2012, then the adjusted premium is applied for 2014). Moreover, small and medium-sized enterprises which take certain occupational safety and health measures can apply for the special merit system, which can adjust the contribution rate within the range of 45 percent.

In the 2011 fiscal year, 77,038 out of 2,013,458 establishments (excluding fixed-term or non-recurrent projects) applied the merit system. The coverage of the merit system is 3.8 percent in terms of number of establishments and around 60 percent in terms of contribution amount. Of these, 63,460 establishments (82.4 percent) had their premium reduced, 11,968 (15.5 percent) had their premium rates increased, and 1,610 (2.1 percent) had their premium unchanged. In both cases where the contribution rates changed, about half attained the maximum adjustment rate of 40 percent.

²⁵ The condition requires that the number of employees should be more than or equal to 0.4 divided by the corresponding industrial contribution rate in respect of work-related benefits.

B.2 Quebec

In Quebec, the contribution rates for the financing of the provisions in the *Act respecting Industrial Accidents and Occupational Diseases* and the *Act respecting Occupational Health and Safety* are set by industry. Contribution rates are determined annually. In 2013, the contribution rates are set for 184 units from 0.56 percent to 19.43 percent, with the average of 2.08 percent. The contribution rate is the sum of the “uniform rate” which is common for all industries (0.43 percent) and the “risk-based rate” which varies by industry.

With the aim of providing employers with incentives for accident prevention, facilitating rehabilitation and promoting prompt and lasting return to work, two experience rating systems are in use. The personalized rate system applies to enterprises with annual contributions between 7,500 Canadian dollars (CAD) and 425,000 CAD, and the retrospective system applies to enterprises with annual contributions over 425,000 CAD. Participation is automatic when thresholds are met. About one third of employers corresponding to 80 percent of contributions are subject to some forms of experience rating.

Under the personalized rate system, each enterprise has its personalized risk-based rate obtained by applying a “risk index” to the risk-based rate of the unit(s) in which the enterprise is classified. The risk index is determined by the following formula:

$$\text{Risk index} = (\text{experience index}) \times (\text{degree of personalization}) + (1 - \text{degree of personalization}).$$

The experience index is determined by comparing the individual enterprise’s employment injury costs over the four preceding years to those of all enterprises in the same unit. The employment injury cost for each claim is calculated as the sum of the benefits multiplied by a factor considering its expected future costs, subject to coinsurance factors and limits. The degree of personalization is a statistical credibility factor that varies reversely with the expected costs of the enterprise. The resulting risk index is limited to a maximum of 3. The total contribution rate of an individual enterprise is the sum of the personalized risk-based rate and the uniform rate.

In fact, the actual process is more complex as several adjustments are made at different stages to ensure that the system is financially well-balanced. Furthermore, the risk-based rate is divided into two parts, namely the short-term risk and the long-term risk. Their relative weight varies by industry. This allows calculating two risk-indexes based on two different degrees of personalization. The statistical credibility of short-term costs is larger than that of long-term costs.

Under the retrospective system, refunds or surcharges, the latter being subject to a maximum, are made to the enterprise based on the comparison of the costs incurred by the enterprise and the contribution paid (through application of the personalized rate) four years later. For example, an enterprise subject to retrospective rating in 2013 pays its contribution in 2013, which is calculated by using the personalized rate described above. A refund or a surcharge will be determined in 2017, consisting in the difference between the contribution paid in 2013 and the incurred costs of injuries occurred in 2013. Such costs are calculated as of 31 December 2016 taking into consideration the payments made until that date and an estimate of the future payments. Employers have the possibility of selecting a limit per claim for the calculation of injury costs that best meets their insurance needs.

B.3 Romania

The Romanian rating system is stipulated in Government Decision No. 144/2008 concerning the methodological standards for calculating the insurance premium for work accidents and occupational diseases.

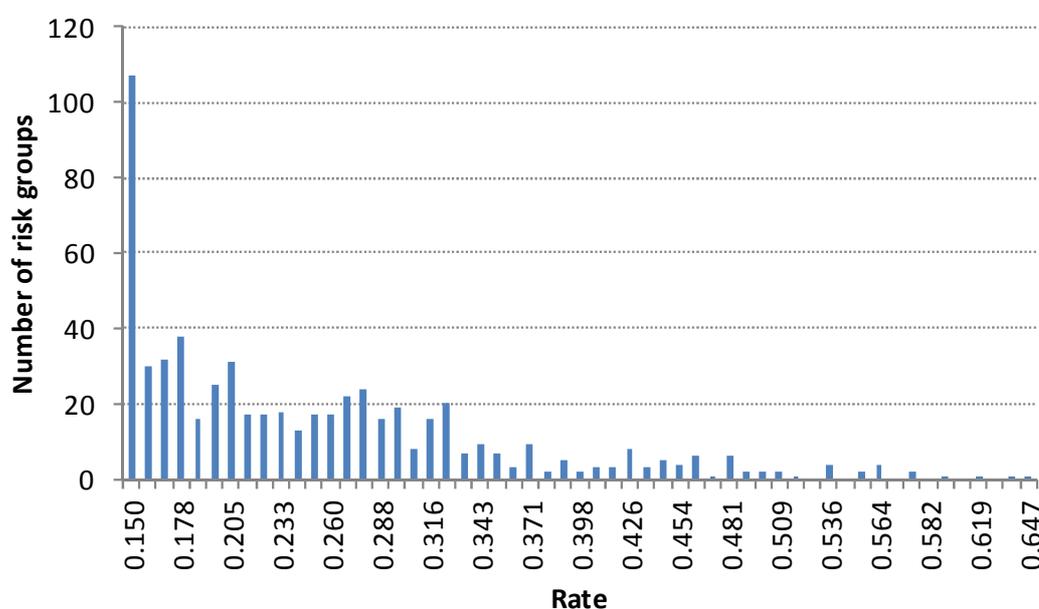
In Romania, employers are classified into 609 classes in line with NACE Rev. 2. For each class of employers, a contribution rate is determined based on the following four frequency indices (expressed per 1000 employees):

- (I₁) the number of work accidents;
- (I₂) the number of disability and fatal cases;
- (I₃) the number of occupational diseases;
- (I₄) the number of employees in special and hazardous conditions.

Data of the most recent three years are used for the assessment of these frequency indices (e.g., the 2013 rate setting refers to the 2009-2011 data).

For each of the above four frequency indexes, the value of the risk class (denoted by CR₁-CR₄, respectively) is defined²⁶ between 1 and 20. The average of these values is the overall risk class (CR) of the industry class concerned. As a result, there are 55 levels of overall risk class from 1.00 to 14.50 by a step of 0.25. For each of 609 NACE Rev.2 industrial classes in Romania, the contribution rate (TR) is determined in proportion to its risk class. Contributions rates vary linearly from 0.150 percent for risk class 1.00 to 0.657 percent for risk class 14.50.²⁷ Figure B.1 presents the number of industrial classes (risk groups) by contribution rate.

Figure B.1 Number of risk groups by contribution rate in Romania, 2009



The mode of the above distribution is the lowest rate at 0.150 percent, and its median is 0.224 percent. Its average is estimated at around 0.25 percent (though it is necessary to take the weighted average with respect to insurable earnings of each group, the simple average is used as a proxy). The distribution has a long tail and the highest contribution rate is assigned to “Casting of steel” (NACE Rev. 2 code 24.52).

Annex C Technical assessment of the new work injury reporting system

C.1 Development of the new system

The initial plan for the development of a new work injury reporting system dates back to the adoption of the Law on Occupational Safety and Health in 2005. The basic system requirements were developed based on the inputs from key stakeholders including the social partners, the Ministry of Labour (Labour Inspectorate and OSH Directorate), the Ministry of Health, primary health care centres, medical officers etc. From the discussions undertaken during this assessment it was found that there was general acceptance by most stakeholders for the broad design of the system.

A number of options were considered that ranged from manual systems using enterable PDF forms to a fully distributed web-based system. Given that around 75 percent of Serbian households have access to internet and that all 349 primary health care centres are connected to the internet and use a web-based system, it was decided that the new system would be web-based.

The system was essentially completed in 2010 and has been trialled in the city of Valjevo since 2013. Current plans are to implement the system across Serbia by mid-2014.

C.2 The IT system assessment

(1) Architecture

At this point there does not appear to be any national guidelines for the architecture of the government IT systems in Serbia. Whilst there may be some future guidelines for the standardisation of computing platforms and software it is most likely to be developed in the future as part of the potential integration of Serbia into the European Union. The European Union has the most advanced development guideline for health care systems. More details about the EU guidelines are provided in section C.3.

The new work injury reporting system is consistent with the guidelines in that it uses objects that are stored in a database environment and can be communicated via the internet or VPN's to authorized users in the health care and government institutions.

(2) EU/WHO Integrated Health Information System

Another health IT initiative currently being implemented in Serbia is the EU/WHO Integrated Health Information System Project.²⁸ This project aims to implement a hospital information system in 19 selected hospitals and the development of an electronic health record in Serbia.

²⁸ www.eu-ihis.rs

This system development is well advanced and trials are currently being conducted in a number of hospitals in Serbia and the system architecture has been developed together with an implementation strategy.

It is expected that the “auto fill” facility for the work injury report forms will continue to be available after the implementation of the electronic health record.

(3) Capability of the system developer

The local company *Q bit projekt*²⁹ was engaged to develop the work injury reporting system and design the automatic links to the existing primary health care system for the personal data of the employees.

The company *Q bit projekt* has substantial experience in IT systems development in Serbia. More significantly it has produced IT systems for about 70 percent of the primary health care organisations in Serbia. Given its background and experience in IT development in Serbia particularly in the area of health care, *Q bit projekt* is reasonably well placed to develop the work injury reporting system with a view to its future integration into the overall health care systems environment in Serbia.

(4) Database design

The database for the health care systems is MySQL.³⁰ This is an open source database sponsored by Oracle which is used by a number of mid-level organisations. Full details of the system including its technical specifications are available on the website. The MySQL Community version is free and higher versions require annual subscriptions for which additional features in the system are provided.

Based on this information it is considered that the MySQL database system could adequately support the new system and offers the opportunity for future extension and also integration with other database systems currently in use in Serbia, particularly in the field of health care.

(5) Systems support

Assessment of the location and capabilities for systems support is difficult at this stage as there is still a degree of uncertainty about a number of key elements in the system. The appointment of the Institute of Occupational Health as the single hub is widely supported but not legislated. The potential effects of the amendments to the Law on Occupational Safety and Health are also unknown. At this stage the systems support and training will come out of the Institute of Occupational Health as will the project management for the implementation rollout. Technical support for the system will be provided by *Q bit projekt*.

The database is currently located and maintained in a commercial centre in Belgrade but there are plans to locate the database in the forthcoming National Data Centre. This has the potential for access to other secure government databases.

²⁹ www.bitprojekt.co.rs

³⁰ www.mysql.com

C.3 The European Union guidelines on health care records

This section provides an overview of potential EU directions in health care information systems and the basic justifications for them.

(1) ProRec

The ProRec initiative of 1996 is a network of national non-profit organisations. The initiative was a consequence of the conclusions of the Concerted Action MEDIREC (1994-1995) to promote the use of electronic health record systems in the European Union. The ProRec initiative is supported by the DG Information Society of the European Union through the ProRec Support Action (1996-1998), and the WIDENET Accompanying Measure (2000-2003).

The goal of the initiative is to build awareness of the limitations, shortcomings and obstacles on the way towards widespread development, implementation and use of quality electronic health records. Especially significant for implementing electronic health record systems is the ability to communicate and interoperate.

(2) CEN/TC 251

CEN/TC 251 (CEN Technical Committee 251)³¹ is a workgroup within the European Union working on standardization in the field of health information and communications technology. The goal is to achieve compatibility and interoperability between independent systems and to enable modularity in electronic health record systems.

Workgroups establish requirements for health information structure in order to support clinical and administrative procedures, technical methods to support interoperable systems. In addition they establish requirements regarding safety, security and quality.

The seven Working Groups in CEN/TC 251 are:

- WG1: Healthcare Information Modelling and Medical Records
- WG2: Healthcare Terminology, Semantics and Knowledge Bases
- WG3: Healthcare Communications and Messages
- WG4: Medical Imaging and Multimedia
- WG5: Communication with Medical Devices
- WG6: Healthcare Security, Privacy, Quality and Safety
- WG7: Intermittently Connected Devices (including Cards)

(3) *openEHR*

The *openEHR* is an open standard specification in health informatics that describes the management and storage, retrieval and exchange of health data in electronic health records. In *openEHR*, all health data for a person is stored in a “one lifetime”, vendor-independent, person-centred electronic health record.

³¹<http://www.cen.eu/CEN/Sectors/TechnicalCommitteesWorkshops/CENTechnicalCommittees/Pages/Standards.aspx?param=6232&title=CEN%2FTC+251>

The *openEHR* specifications include information and service models for the electronic health record, demographics, clinical workflow and archetypes. They are designed to be the basis of a medico-legally sound, distributed, versioned electronic health record infrastructure. They are based on a combination of European and Australian research and development into electronic health record systems.

The *openEHR* specifications are maintained by the *openEHR* Foundation, a not-for-profit foundation supporting the open research, development, and implementation of *openEHR*.

(4) The European Standard on the Electronic Health Record Communication

The overall goal of the European Standard on the Electronic Health Record Communication (EN 13606) is to define a rigorous and stable information architecture for communicating the electronic health records. This is achieved through support of the interoperability of systems and components that need to communicate (access, transfer, add or modify) electronic health record data.

The European Standard is not intended to specify the internal architecture or database design of electronic health record systems or components, but the scope includes the use of an “object” which can be stored, retrieved and exchanged. It is explicitly not intended to prescribe the kinds of clinical applications that might request or contribute electronic health record data in particular settings, domains or specialities.

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