

# THE EFFECT OF CHANGES IN SICKNESS INSURANCE ON INCAPACITY FOR WORK IN SELECTED REGIONS OF THE CZECH REPUBLIC

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## Abstract

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Sickness insurance as part of social insurance is obligatory for a majority of Czech citizens – i.e., they are required by law to pay this insurance. On the other hand, they are entitled to certain benefits of this system in the case of social events determined by law. Legislative changes in sickness insurance significantly influenced the development of all indicators of temporary incapacity for work (TIW) in individual regions. These changes are reflected most markedly in the indicators of the number of new cases of TIW per 100 insured persons, the average duration of 1 case of TIW and the average percentage of TIW. The aim of this paper is to give an idea of sickness insurance, especially of the impact of legal regulation changes in the system of this insurance on employees, who represent the largest share of socially insured persons, focusing on Prague, the Moravian-Silesian and the South-Moravian regions. The impact of changes in sickness insurance will be presented by selected indicators of temporary incapacity for work using regression analysis to estimate the development of individual indicators in the following years based on knowledge of the development of indicators in the years 2000–2014. Reform steps in the area of sickness insurance and sickness benefits have brought a reduction in the number of cases of incapacity for work and extending the length of one case of TIW. The value of the average percentage of incapacity for work was also registered a decrease in the researched period.

Keywords: sickness insurance, sickness benefits, TIW, employees, Czech Republic, regions, R<sup>2</sup> index

## INTRODUCTION

Sickness insurance is a part of social security and its task is to insure people participating in this system by the insurance benefits at law intended social events in order to reduce or completely eliminate the effects of these events (Sirovátka, 1997). Social security is a state budget revenue in the Czech Republic and is regulated by Act No. 589/1992 Coll., the social security insurance and contribution to the state employment policy, as amended, and includes three components: sickness insurance, pension insurance and contributions to the state employment policy.

There were changes in the sphere of sickness insurance lately, because revenues generated from the sickness insurance to the state budget

was not enough to cover expenses to pecuniary sickness benefits, which are paid from insurance revenues (Krebs, 2007). Besides other things the Act No. 187/2006 Coll., on Sickness Insurance was approved as a part of the reform of public finances. This Act became effective 1 January 2009 and provides a comprehensive adjustment of the sickness insurance for all persons who are participated in this insurance.

## MATERIALS AND METHODS

The aim of this paper is to give an idea of sickness insurance, especially of the impact of legal regulation changes in the system of this insurance on employees, who represent the largest share of socially insured persons, focusing on selected

regions of the Czech Republic. The impact of changes in sickness insurance will be presented by selected indicators of temporary incapacity for work (TIW) using regression analysis to estimate the development of individual indicators (regresands) in the following years based on knowledge of the development of indicators in the years 2000–2014 (regressors). The research results will be captured using trend line which will display the possible development based on the data in the various regions of the Czech Republic in the following years. Regression equation presents an approximation of the entered values where the coefficients are determined by the method of least squares, so that the sum of squared deviations of the original values from obtained model would be minimum. The  $R^2$  index expresses the degree of reliability of the calculated estimate of the development.

## RESULTS

Sickness insurance as part of social insurance is obligatory for a majority of Czech citizens – i.e., they are required by law to pay this insurance (Tröster, 2005). Compulsory participants of the sickness insurance are employees, who receive or could receive wages or salaries from employers, regardless of the type of employment relationship, as opposed to self-employed persons whose participation in sickness insurance is voluntary (Gregorová and Galvas, 2000).

Participation in sickness insurance commences on the date of entry into employment and expires on the date of termination of employment (Ženíšková and Přib, 2011). The law laid down the conditions for participation in the sickness insurance system together with the subsequent claim for payment of benefits, and these include:

- the performance of gainful employment on the territory of the Czech Republic (if the employee is working temporarily outside the Czech Republic, it has no effect on his/her insurance);
- the minimum level of agreed income, i.e. the applicable income that has been determined to the amount CZK 2,500 since 2012 (since the new law until the end of 2011, the limit of the applicable income was determined to the amount of CZK 2,000);
- an assessable income in an amount higher than CZK 10,000 for employees under contracts for performed work (CPW) accounted (Novotný, 2013).

The amount of the insurance is calculated as a percentage of the assessment base for the relevant period. As for employees, the insurance as a percentage of social security and state employment policy is partly paid by the employee himself and partly by the employer from the gross wage. With regard to providing of wage compensation in the first period of incapacity for work employers were reduced insurance rate by 1 percentage point and in 2009 and 2010 they were also refunded a half of the

I: *Sickness insurance rates*

Payer	Rate
Employee	0.0%
Employer	2.3%
Self-employed	2.3%

Source: Czech Republic (1992) + author's processing

salary compensation in the form of a deduction from the insurance. Tab. I shows the sickness insurance rates of social security as per payers.

The sickness insurance system of benefits comprises four benefits, namely sickness benefit, attendance allowance, maternity benefit, and pregnancy and maternity compensation benefit. Since 1993, when the above-mentioned Act on social security insurance and contribution to the state employment policy came into force, there have been many changes in the calculation of sickness benefits. The amount of these benefits started to be counted from the gross income of employees attained in the previous calendar quarter, and at the same time the rates for the calculation of benefits were reduced. In 1999, the reduction limits were introduced, of which sickness benefits are subsequently calculated.

Since 1 January 2009 a new Act No. 187/2006 Coll. of Sickness insurance has become effective and brought a radical transformation in sickness insurance and sickness benefits in particular (Czech Republic, 2006). Among the most significant changes related to the new legal regulation are in particular:

- payment of refund of wages or salary during the first 14 days,
- payment of sickness benefits only from the 15<sup>th</sup> calendar day of incapacity for work,
- sickness insurance for all insured persons (other than members of the armed forces and safety brigades, persons in custody and convicted persons) is already performed only by social security administrations district offices.

Since 1 January 2011, changes occurred in the payment of sickness benefits by amendment to Act, which were provided from the 22<sup>nd</sup> day of incapacity for work. This situation was in force to 31 December 2013 and then it returned to its original duration, i.e. those sickness benefits are again provided from the 15<sup>th</sup> day of TIW.

Another significant change occurred 1 January 2012, ever since the amendment of the Labour Code introduced a participation in sickness insurance for employees who practise their jobs under CPW at the agreed income higher than CZK 10,000 (Hulec, 2012). Since that time these employees have also been entitled to sickness benefits, if certain conditions are met. The following table shows the changes in the provision of sickness benefits, in their amount and the reduction limits from 2009 to the present.

The reason for the above-described changes in sickness insurance was too high income solidarity,

II: *Changes in sickness benefits in the years 2009–2015*

Year	Payment of benefits	Amount of benefits		Reduction limits		
		Period	Daily rate	First	Second	Third
2009	from the 15 <sup>th</sup> day	from 15 <sup>th</sup> to 30 <sup>th</sup> day	60%	786 CZK	1 178 CZK	2 356 CZK
		from 31 <sup>st</sup> to 60 <sup>th</sup> day	66%			
		from the 61 <sup>st</sup> day	72%			
2010	from the 15 <sup>th</sup> day	from the 15 <sup>th</sup> day	60%	791 CZK	1 186 CZK	2 371 CZK
2011	from the 22 <sup>nd</sup> day	from the 22 <sup>nd</sup> day	60%	825 CZK	1 237 CZK	2 474 CZK
2012	from the 22 <sup>nd</sup> day	from the 22 <sup>nd</sup> day	60%	838 CZK	1 257 CZK	2 514 CZK
2013	from the 22 <sup>nd</sup> day	from the 22 <sup>nd</sup> day	60%	863 CZK	1 295 CZK	2 589 CZK
2014	from the 15 <sup>th</sup> day	from the 15 <sup>th</sup> day	60%	865 CZK	1 298 CZK	2 595 CZK
2015	from the 15 <sup>th</sup> day	from the 15 <sup>th</sup> day	60%	888 CZK	1 331 CZK	2 662 CZK

Source: CSSA (2009, 2010, 2011, 2015) + MLSA (2012, 2015) + author's processing

III: *Development of the main indicators of TIW in the Czech Republic in 2000–2014*

Indicator	2000	2001	2002	2003	2004
New notified cases of TIW per 100 SIP	84.4	86.2	80.4	81.7	61.6
Average duration of TIW (days)	28.0	28.6	30.8	30.5	34.8
Average percentage of TIW	6.5	6.7	6.8	6.8	5.9
Indicator	2005	2006	2007	2008	2009
New notified cases of TIW per 100 SIP	68.2	60.2	59.3	48.6	33.9
Average duration of TIW (days)	32.8	35.3	34.6	39.1	45.1
Average percentage of TIW	6.1	5.8	5.6	5.2	4.2
Indicator	2010	2011	2012	2013	2014
New notified cases of TIW per 100 SIP	30.7	30.1	27.4	30.0	29.5
Average duration of TIW (days)	44.7	44.1	46.1	44.0	45.8
Average percentage of TIW	3.8	3.6	3.5	3.6	3.7

Source: MLSA (2014) + CSO (2015) + author's processing

insufficient control mechanisms and, unfortunately, widespread abuse of the system. Although the state of health of the population demonstrably improved in the Czech Republic, there was not any reduction of incapacity for work of employees. The main indicators of the development of temporary incapacity for work include:

- new notified cases of TIW per 100 sickness-insured persons (SIP),
- average duration of one case of TIW (days),
- average percentage of TIW (the ratio of the number of calendar days of incapacity for work due to disease or injury to the average number of the sickness-insured employees, multiplied by the number of calendar days in a year).

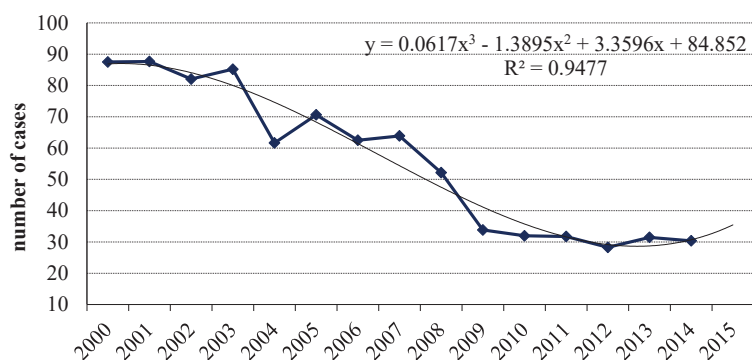
Changes in payment of sickness benefits, including the fact that the benefits were paid from the 22<sup>nd</sup> day of temporary incapacity for work (and also their lower percentage level), had a significant effect on the insured person's decision about the origin of their incapacity for work. As it is evident in the following table, there was a decrease in the number of new cases of temporary incapacity for work in the last decade, the significant drop in the number of new cases of TIW occurred in 2004 due to the aforementioned change in the construction

of sickness benefits and cut rates. Further significant decrease occurred in 2009, when the new sickness insurance legislation came into force.

#### Number of Cases of Incapacity for Work in Selected Regions

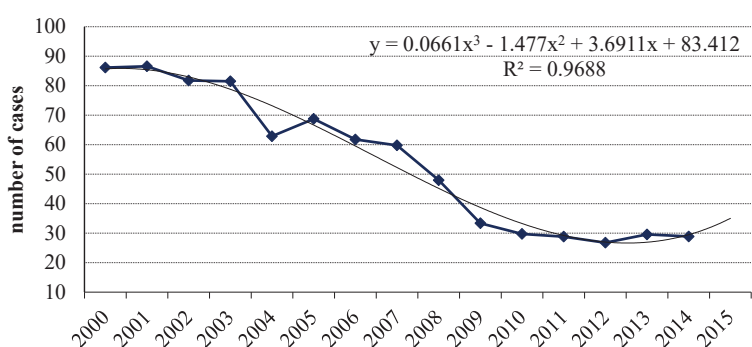
The most common cause of temporary incapacity for work is respiratory diseases, which however last the shortest. In contrast, the longest duration of TIW is caused by tuberculosis and oncologic diseases. Moravian-Silesian Region is one of the areas with the most damaged environment in the Czech Republic, according to some parameters even in Europe. The cause of a heavy air pollution is a high concentration of heavy industry (engineering, metallurgy, and mining of black coal) and energy. Not only over-limit values of airborne dust, but also cancer-causing substances are the cause of a high sickness rate in this region.

The high unemployment rate in the MS Region together with changes in sickness insurance and sickness benefits were the reasons for a drop of incapacity for work of employees. The number of new cases of TIW per 100 insured persons is 65% less in 2014 than at the beginning of the researched period.



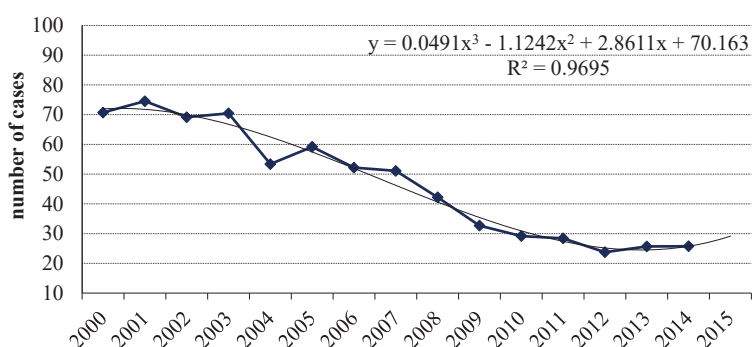
1: Development of cases of TIW in the Moravian-Silesian Region

Source: CSO (2005, 2012, 2015) + author's processing



2: Development of cases of TIW in the South-Moravian Region

Source: CSO (2005, 2012, 2015) + author's processing



3: Development of cases of TIW in Prague

Source: CSO (2013, 2014a, 2015) + author's processing

A similar trend can be seen in the South-Moravian Region, where the number of new cases decreased in the period by nearly 66.5%. Comparing the development of newly notified cases of incapacity for work by the researched regions, it is evident that the value of this indicator decreased the fastest just in the South-Moravian Region.

In Prague, there can be observed the same trend of decrease in the number of new cases of temporary incapacity for work per hundred insured persons, when a reduction was about 63.5%. Compared Moravian regions the number of new cases per 100

SIP was around 16 cases less than at the beginning of the researched period. In the last year the difference was only 4 cases.

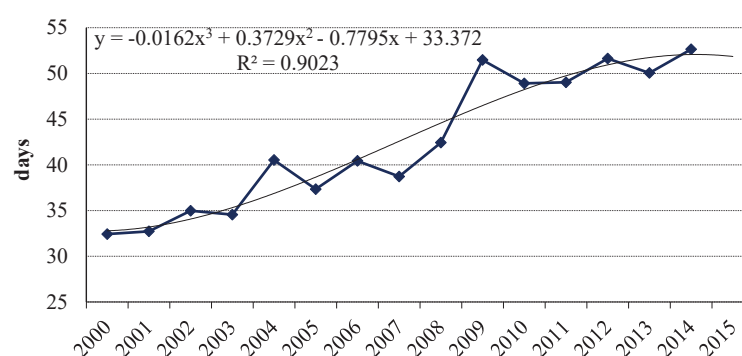
Development of the number of cases of incapacity for work in Prague and the Moravian regions follows the national trend, including the decline in 2004 and further significant decline in 2009. The decrease should continue, but we cannot expect a radical decline in cases of temporary incapacity for work rather than a constant state. Expectations are confirmed by the regression equation with a high degree of reliability  $R^2$  for each region.

### Duration of Incapacity for Work in Selected Regions

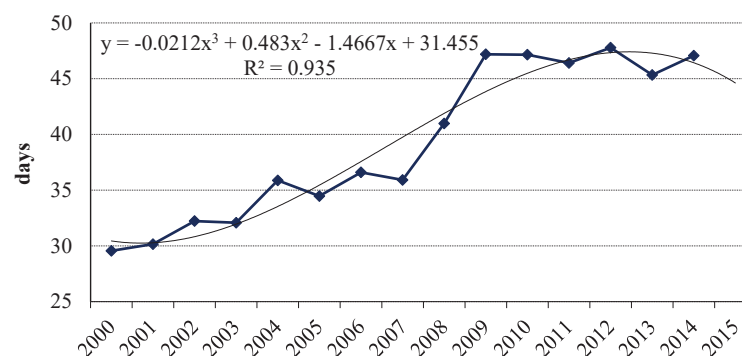
The number of days of incapacity for work declined in the Moravian-Silesian Region in each year up to 7,332,540 days in 2014, but the average duration of incapacity for work was extended by almost 20 days, while in 2000 it was only 32 days.

The number of days of incapacity for work decreased in South-Moravian Region by 5,349,117 days during the last 10 years, on the other hand the average duration of 1 case of TIW increased by 36.5%, the highest value (47.8 days) of this indicator was in 2012.

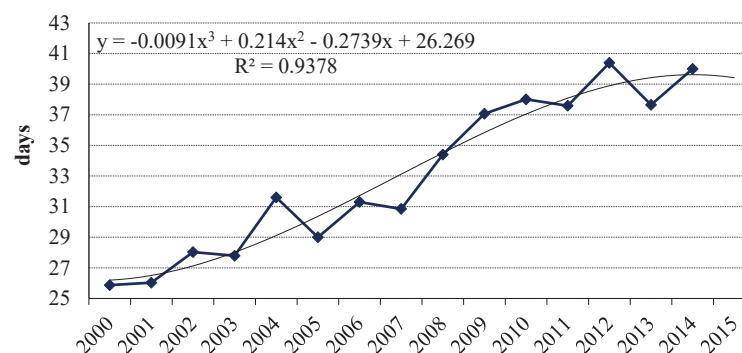
The development of the average duration of temporary incapacity for work has a completely opposite course, but the comparison of Moravian regions with national results shows the same trend, that is the increase of TIW. In 2000, in Moravian regions was the period of incapacity for work due to sickness about a month; in the following years, the duration of the period was growing until it reached on average 49.5 days in 2009, which is an increase of 37%. In the following years there was a slight decline, but it can be expected (based on regression analysis, the reliabilities 0.9023 and 0.935), the duration of TIW will not be changed significantly in the following years.



4: Development of duration of TIW in the Moravian-Silesian Region  
Source: CSO (2014b, 2015) + author's processing



5: Development of duration of TIW in the South-Moravian Region  
Source: CSO (2014b, 2015) + author's processing



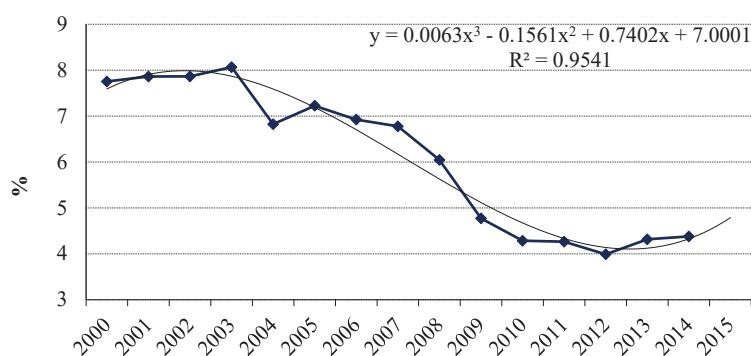
6: Development of duration of TIW in Prague  
Source: CSO (2013, 2014a, 2015) + author's processing

The prolongation of one case of temporary incapacity for work occurred also in Prague. The average duration of TIW increased from almost 26 days in 2000 to 40 days in 2014 in the capital city.

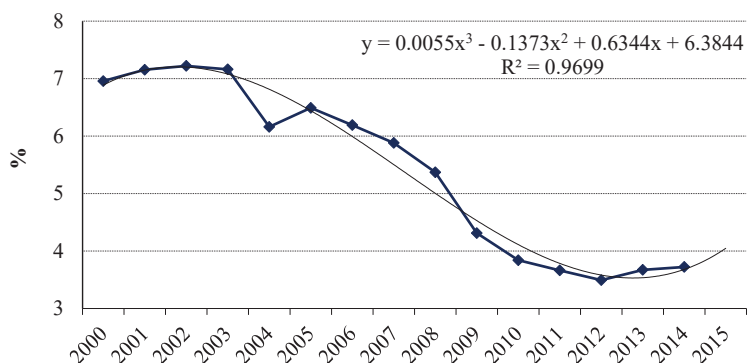
### Average Percentage of Incapacity for Work in Selected Regions

The value of the average percentage of incapacity for work was also decreasing in the researched period. This indicator takes into consideration both the total number of cases of incapacity for work (how often people start their incapacity for work) and an average duration of one case of TIW (how

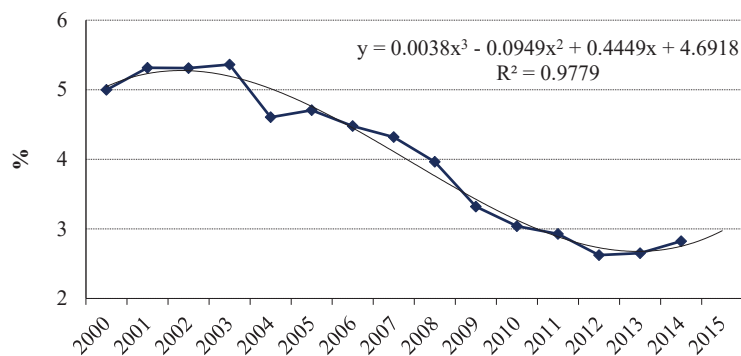
long they remain on incapacity for work). Since differences in the number of cases of TIW per 100 insured persons in the individual regions are not very significant, the average duration of TIW rather determines the ranking of regions by the level of the average percentage of incapacity for work. The highest average percentage of TIW was registered in the Moravian-Silesian Region. The average percentage of incapacity for work began to decrease in 2004 (with the exception of 2005) and reached its lowest level in 2012, when 4 of 100 insured persons were incapable of work on average each day.



7: Development of average percentage of TIW in the Moravian-Silesian Region  
Source: CSO (2014b, 2015) + author's processing



8: Development of average percentage of TIW in the South-Moravian Region  
Source: CSO (2014b, 2015) + author's processing



9: Development of average percentage of TIW in Prague  
Source: CSO (2013, 2014a, 2015) + author's processing



Since 2005 the average percentage of incapacity for work has been decreasing, most in Moravian regions, especially in the Moravian-Silesian and the South Moravian Regions. In practice it means that the number of incapacitated persons for work per 100 insured persons decreased on average 3.5 persons in the Moravian-Silesian Region and about 3.3 persons in the South Moravian Region. Despite a moderate increase of the indicator in the last year, it can be predicted on the basis of the development from 2000 to 2012 (with an average reliability of 0.96) that the number of incapacitated persons for work per hundred insured persons will not significantly change in the following years.

The highest sickness rate was showed in the Moravian-Silesian Region during the whole period, on the other hand the lowest one was in Prague. At the beginning of the researched period the average percentage of incapacity for work in Prague was by almost 2.5 percentage points less than in the Moravian regions. Last year the difference was only 1.2 p.p. Nevertheless this indicator keeps the lowest value in Prague compared with other regions.

## DISCUSSION

A significant research in the area of sickness insurance has been performed in the Scandinavian countries, especially in Sweden and Norway, where has been researched not only the historical development of the Swedish social insurance system and its reform (Edebalk, 2009), but also has been compared the processes of reforming sickness insurance in Norway and Sweden (Hagelung and Bryngelson, 2014).

Ståhl *et al.* (2011) researched the effect of changes in the Swedish sickness insurance system on the

return to work with a special focus on work ability assessments and Larsson (2006) is engaged in the interactions between unemployment and sickness insurance. A similar research was performed by Hall (2011). Hägglund (2013) also researched the impact of changes in the Swedish sickness insurance system on incapacity for work respectively on the employees' return to work and used a Cox proportional hazard model.

The impact of reforms in the sickness insurance system was also researched in Germany by Ziebarth and Karlsson (2014), one of the areas of research was the matter how the increase of sickness benefits affects a duration of incapacity for work. They used a ZINB-2-DiD regression.

This paper determines the effect of changes in sickness insurance on incapacity for work in selected regions of the Czech Republic using an elementary research method  $R^2$  Index. It was found that legislative changes in sickness insurance significantly influenced the development of all indicators of temporary incapacity for work in individual regions. These changes are reflected most markedly in the indicators of the number of new cases of TIW per 100 insured persons, the average duration of 1 case of TIW and the average percentage of TIW. This fundamental research can also become the basis for further, thorough exploration of the issue, where could already be used more sophisticated methods such as Automatic Interaction Detection (AID), Chi-square Automatic Interaction Detection (CHAID), Classification and Regression Trees (CART) or a method based on an approach from intelligent data mining, cluster analysis.

## CONCLUSION

Demographic aging causes not only an economic slowdown, but also an increase of health care costs and growing problems in the field of social security. And just social benefits represent the most important component of the state budget mandatory expenditures. There are not only the benefits of the pension and social security, but also sickness insurance benefits, which include sickness benefits, maternity benefits, attendance allowance (formerly assistance in taking care of a family member) and compensatory benefits in pregnancy and maternity. Self-employed persons that pay sickness insurance voluntarily may only have the first two benefits unlike employees.

In the social system of the Czech Republic there were extensive changes in the area of sickness insurance in 2008 and 2009, which were the largest since 2004. A basic change was a reduction of sickness percentage rate for the first three days of incapacity for work from 50% to 25% of the daily assessment basis in 2004. In the course of the year 2008 there were made adjustments in sickness insurance three times (effective from 1 January, 30 June and 1 September). These bore on changes of the payment of sickness benefits for the first three days of illness and related assessment base for determining of the amount of the daily sickness benefits. More substantial changes have been in force from 1 September 2009. A primary one was the payment of sickness benefits from the 15<sup>th</sup> day of temporary incapacity for work (from the 22<sup>nd</sup> day of TIW in 2011 and 2012). Employers pay compensation for wages to employees during first 14 (resp. 21) calendar days of TIW, but only for working days from the 4<sup>th</sup> day in the amount of 60% of average reduced wages. Other changes include a reduction of social insurance and voluntary sickness insurance burden. The aim of these changes was to increase the motivation of employees and employers to reduce an excessive incapacity for work.

All mentioned reform steps in the sphere of sickness insurance and sickness benefits, especially the fact that during the TIW the benefits were provided only from the 22<sup>nd</sup> day, influenced the decisions of employees about their temporary incapacity for work significantly. In the first observed year, nearly 85% of employees stayed in temporary incapacity for work at least once during the year, in 2004 their number decreased by 20%. In the last year of the "old" legal regulation (2008) the number of TIW decreased by another 13%. This year a new Act on Sickness insurance should already be in force, but its effectiveness was postponed by a year, which influenced the TIW in such a way that this year it was used by only about every second insured person. In 2009, when the new sickness insurance legal regulation came into force, the number of insured persons decreased by a further 15% and in 2011 approximately 2/3 of employees did not receive any wage compensation and sickness benefits at all. The reasons seem to be based on the extensive social and economic causes, the higher dynamics and variability of life in a market economy. Along with legislative regulations of sickness benefits and the threat of unexpected loss of a job, functional status, or any other security (e.g. in the sphere of housing, etc.), as well as civilisation factors accompanied by a more frequent incidence of mental illness have more or less related effect.

Legislative changes in the sickness insurance influenced the development of all indicators of temporary incapacity for work significantly. These changes are reflected noticeably in indicators such as the number of cases of TIW in total and per 100 sickness-insured persons, the average duration of one case of TIW, the average daily number of TIW workers and the average percentage of TIW. In the new notified cases per 100 sickness insured persons the capital city of Prague is distinguished from other regions. Prague was significantly below the national average in the number of cases until 2008, the most in 2000 by 16%, in the years 2005–2008 by 13–14%. In 2009, resp. in 2010 the capital city remained below the national level just only by 3.5%, resp. 5%, due to the large decrease in new notified cases of TIW in other regions.

Comparative indicators affecting different aspects of incapacity for work show that there have been significant changes recently. The question is whether these changes have led to an enlargement of regional disparities and the unfavourable situation still persists in the same regions or not.

Currently it is discussed a revocation of the waiting period, thus restoration of the payment of sickness benefits for the first three days of temporary incapacity for work. However, the amount of benefits should be lower than for the other days of illness. It is not clear whether this sickness benefits should be reimbursed initially by the state or by employers, for whom it would mean an additional financial burden. The proposed change in the area of sickness insurance benefits can reverse the trend in the incapacity for work of employees in the regions of the Czech Republic.

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