Folia Oeconomica
Acta Universitatis Lodziensis
ISSN 0208-6018 e-ISSN 2353-7663
www.czasopisma.uni.lodz.pl/foe/
1(333) 2018

DOI: http://dx.doi.org/10.18778/0208-6018.333.03

Małgorzata Striker
University of Łódź, Faculty of Management, Department of Human Resources Management,
malgorzata.striker@uni.lodz.pl

Ewa Kusideł
University of Łódź, Faculty of Economics and Sociology, Department of Spatial Econometrics,
ekusidel@uni.lodz.pl

Determinants of Employee Absence Differentiation

Abstract: The aim of this article is to examine the changes in the sickness absence rate in Poland in 2005–2015 (in the period for which statistical data allowing for the calculation of this ratio are available) and, first of all, its territorial differentiation in 2012–2015. The research question has been formulated as follows: what are the factors which determine the changes in the absence rate within time (on the whole country level) and in 16 Polish regions? In accordance with the literature review performed, the analyses have covered health (self-evaluation of health condition, subjective assessment of conditions and quality of living, the mortality in the event of incidence of certain illnesses) as well as social and economic factors (structure of population according to age and sex, the income of households, subjective assessment of the material situation, poverty level, unemployment rate, employment structure according to NACE classification and structure of population according to the education level) which may affect the changes within time and the regional differentiation of the sickness absence rate.

Keywords: absence, sickness absence rate, labour market

JEL: J88

1. Theoretical introduction

Employee absence is quite simple to define and most often it is assumed that it means "the employee's failure to report for scheduled work" (Johns, 2008: 160). The reason for sickness absence is the incapacity for work caused by sickness. Therefore an important determinant of the sickness absence rate is employee health condition, which depends on four basic factors: (1) life style, (2) physical and social environment of life, work and education, (3) genetic factors (4) healthcare system. It is stressed that important premises for maintaining health are social and economic conditions, while the major threats are poverty and low level of education (*National Health Programme*: 10). Research on morbidity and use of healthcare in Poland proves that frequency of treatment is strongly dependent on sex and age. For example, females more often than males use hospital treatment. The frequency of treatment ratio is the lowest among persons aged 20–35 years, and then it gradually increases, particularly intensely for those aged 55+ (*Health and Healthcare in 2014*: 63–64).

However, employee sickness absence cannot be equivalent to sickness itself. As A. Mastekaasa (2005: 2262) indicates, sickness absence should be rather considered as illness behaviour, being defined as *the manner in which persons monitor their bodies, define and interpret their symptoms, take remedial action, and utilise various sources of help* (Mechanic, 1986: 101). This means that employee health is, obviously, important, but equally important is *how people react and behave in the presence of a health problem* (Mastekaasa, 2005: 2262).

Therefore absence at work due to sickness is strongly dependent, not only on the employee health condition, but also on legal regulations and social and economic situation. Statistical research carried out so far? allows one to select three factors of regional differentiation of the sickness absence rate (Bartkowski, 2004: 71–72):

1) character of the social security system – the more extensive the system of benefits and the higher amount of social security, the higher absence in a given country;
2) unemployment rate – the higher unemployment, the lower the level of use of sick leaves; in the event of employment reduction, the first persons to be made redundant are those more often absent at work; moreover the fear of job loss affects the use of leaves from work;
3) employee habits shaped by cultural values characteristic of a given country.

The analysis of the sickness absence rate in Sweden in 1970–2005 (Selander, Buys, 2010) has shown that despite constant increase in the level of healthiness observed, the absence varied significantly in particular years (it increased or decreased). "The hypothesis that high rates of sickness absence can be explained by poor health in the Swedish population was not supported. In terms of fluctuations in sickness absence rates […] it is difficult to find any health related data to explain this finding" (Selander, Buys, 2010: 40). If fluctuations in the absence rate cannot

be explained by the health condition, what other variables affect the sickness absence? One of the possible explanations proposed by the authors is the relation between sickness absence and employment conditions, as well as the fear of job loss. In the period of a downturn of the economy, which leads to the increased unemployment rate, sickness absence is low, and during the economic boom, when the unemployment rate is low, the absence is high.

Research on the relation between the unemployment rate and the range of sickness absence was carried out extensively in the 1980s. Among the first scientists to confirm the negative correlation between the unemployment rate and the sickness absence rate were J.P. Leigh (1985), as well as C. Shapiro and J. Stiglitz (1984). The results of that research became an inspiration for further analyses, allowing to specify the influence of the conditions on the labour market on the level of absence at work (Yaniv, 1991). Also, the research carried out by K. Piha, P. Martikainen, O. Rahkonen, E. Roos and E. Lahelma (2007), as well as U. Lidwall and S. Marklund (2011) confirm the negative correlation between absence and unemployment. However, the strength of the relationship between unemployment and sickness absence depends on the legal regulations conditioning the availability and the amount of sick allowances and unemployment benefits (Hytti, 2006; Helgesson et al., 2015).

In Poland, scientific research on the employee absence is carried out to the highest extent by specialists in health economics, public health and labour medicine (Pęciłło-Pacek, 2014, Pęciłło, 2015). Research related to social determinants of absence is scarce, therefore dependencies between absence rate and social and economic factors have not been identified well, although it has been indicated that the decrease in the absence rate in Poland after 2000 was influenced by the changes in the social security system connected with the social and economic transformation (Szubert, 2014). High absence rate after 1990 was related to restructuring of the state-owned enterprises and difficult situation on the labour market. The threat of being fired resulted in many employees' escape into long-term sick leaves and taking actions aimed at receiving pension benefits (Szubert, Sobala, 2003). Also, the results of research on sickness absence in 1990–2003 prove that in the first years of transformation and related mass redundancies, an opposite relationship between absence and unemployment rate was observed. In the regions with high unemployment rate, cases of excessive use of leaves as a means of postponement of job loss were noted (Giermanowska, Racław-Markowska, 2004: 8). It is also indicated that sickness absence is higher in areas with worse working conditions, both physical (Szubert, Sobala, 2003), as well as psychological and social (Szubert, Marecz-Kot, Sobala, 2009).

The aim of this article is to examine the changes in the sickness absence rate in Poland in 2005–2015 (in the period for which statistical data allowing for the calculation of this ratio are available) and, first of all, its territorial differentiation in 2012–2015. The research question has been formulated as follows: what are the factors which determine the changes in the absence rate within time (on the whole country level) and in 16 Pol-

ish regions? In accordance with the literature review performed, the analyses have covered health as well as social and economic factors which may affect the changes within time and the regional differentiation of the sickness absence rate. Health factors include self-evaluation of health condition, subjective assessment of conditions and quality of living, as well as the mortality in the event of incidence of certain illnesses. Demographic factors include, first of all, the structure of population according to age and sex. Economic factors include the income of households, subjective assessment of the material situation and poverty level. Factors related to labour market differentiation, taken into account in the research, include the unemployment rate, employment structure according to NACE classification and structure of population according to the education level.

2. Statistical data – sources and definitions

Data on sickness absence broken down into voivodeships have been gathered since 2004. Unfortunately, at the turn of 2011 and 2012, there was a change in the methodology, which made the data collected before 2012 incomparable with the data gathered after 2012. Therefore regional analyses cover the years 2012–2015, and the pan-Polish analyses cover the years 2005–2015.

Data on sickness absence year by year for 2012–2015 come from thematic materials on sickness absence published on the website of the Polish Social Insurance Institution (ZUS database). For the purposes of the analyses, the following information was used: the number of days of sickness absence due to own sickness of the persons insured in ZUS, and the number of persons to whom at least one sick leave certificate was issued in a given period, calculated on the basis of cases of certified incapacity for work, described and submitted to ZUS on ZUS ZLA forms in 2012–2015 by the physicians issuing these certificates.

The data on the number of the persons insured in the subsequent quarters of the years 2012–2015 also come for statistical materials published on the ZUS website (ZUS Statistical Portal database), where for the purpose of analysing the yearly data a mean from 4 quarters of each year has been assumed.

On the basis of these data, the absence rate has been calculated as the quotient of the number of days of absence and the number of the persons insured. In other words, the absence rate analysed in this paper presents an average number of the absence days falling upon one person insured.

Additionally, in the search for factors responsible for regional differentiation of absence in Poland the data have been used, derived from the following sources:

1) Local Data Bank of the Central Statistical Office of Poland (GUS database) – used in Chapter 4.1 (Table 3);
2) *Moja Polis* portal (where many data monitored by the Ministry of Health have been collected) – used in Chapter 4.1 (Figure 2);

3) Eurostat (with quite extensive BAEL data division into sections and economic sectors[1]) – the first variable in Table 2;
4) *Social Diagnosis* (2015 edition) – data from Table 2 – apart from the first variable, which comes from the Report of the Central Statistical Office of Poland: *Health and Health Behaviours of the Inhabitants of Poland in Light of the EHIS 2014 Survey.*

3. Characteristics of the absence rate in Poland in 2005–2015

In Figure 1, the variability of the sickness absence rate in Poland in 2005–2015 has been presented. It follows from this Figure that the absence rate in Poland is diversified: it ranges from 13.6 sick days per person insured in 2005 to 15.6 sick days per person insured in 2015. As it stems from other article by the authors of this paper, the main economic factor diversifying the absence level is the unemployment rate. The line reflecting the unemployment rate, added to the Figure, expressly indicates that the years with high (low) unemployment rate are also characterised by low (high) absence rate. This observation is also confirmed by high (and statistically significant) negative correlation between the unemployment rate and the absence rate, which is –0.78.

If we slightly simplify the voivodeship data[2], the relationship between the unemployment rate and absence in individual voivodeships is also negative[3].

[1] Local Data Bank (GUS) publishes data on employment in 3 sectors only, while Eurostat offers the division into as many as 7 categories; in particular public services could be separated from the service sector, which, as it turned out, is significant in explaining the regional differentiation of absence in Poland.

[2] As it was mentioned in the Introduction, at the turn of 2011 and 2012, the definition of the person insured changed. In 2005–2011, data on the persons insured in terms of old-age pension and sickness were assigned to a voivodeship according to the seat of the contribution remitter, while in 2012–2014, the assignment to voivodeships was made on the basis of a place of residence of the person insured. This amendment lead to – sometimes significant – change in the share of the persons insured in individual voivodeships at the turn of 2011 and 2012. Therefore, to analyse the changes in the absence rate within time for individual voivodeships, extension of data from 2005–2011 on the number of the persons insured according to the seat of the contribution remitter was necessary. To this end, the following fact was used: the shares of the persons insured, defined in this way, in particular voivodeships were either relatively stable over the years, or they noted quite a stable, however moderately decreasing trend. On the basis of the known dynamics of the shares and the number of the persons insured in Poland, the number of the persons insured in particular voivodeships in 2012–2015 has been calculated.

[3] Although diversified – the weakest relationship has been observed for Podkarpackie and Świętokrzyskie voivodeships (two voivodeships with the highest unemployment rates in 2014 and with relatively high absence rate). Weak relationship between the unemployment rate and the absence rate has also been noted in the Mazowieckie voivodeship – with good conditions on the la-

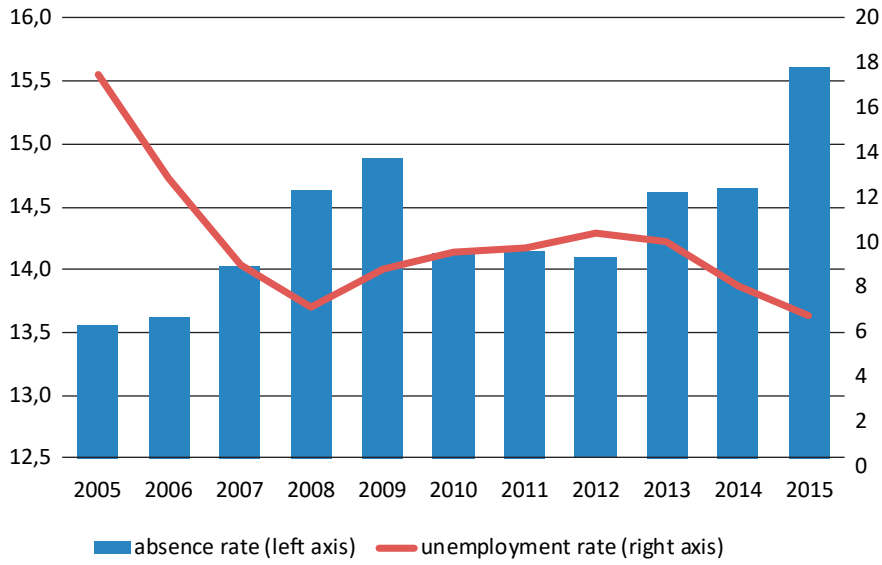

Figure 1. Sickness absence rate in Poland (the average number of sick days per person insured) and the unemployment rate

Source: own elaboration based on ZUS and GUS database

As already mentioned in the Introduction, the correlation between the unemployment rate and the absence rate is indicated in many surveys in this domain – the above analyses confirm this dependency, known from the literature on the subject. Finally, it may be concluded that both in terms of the entire country, as well as individual voivodeships, a negative correlation (in time) between the unemployment rate and the absence rate may be observed, i.e. the higher (lower) unemployment rate in a given year, the lower (higher) absence rate in that year.

The question whether similar dependencies can be observed in the regional differentiation of absence is discussed in further chapters of this paper.

bour market (low unemployment) and with the lowest absence rate. In the 13 remaining voivodeships a strong negative correlation in time between regional unemployment rate and the absence rate could be seen – the strongest in Zachodniopomorskie, Śląskie and Dolnośląskie voivodeships, characterised by good conditions on the labour market (relatively low unemployment rate) and an average absence rate.

4. Regional differentiation in the absence rate in 2012–2015

Voivodeship data according to uniform definition of the absence rate have been available only since 2012. Table 1 presents values of the absence rate for all years examined, while Map 1 shows the differentiation for 2015.

Table 1. Regional differentiation in the absence rate

	2012	2013	2014	2015
Poland	**14.2**	**14.7**	**14.7**	**15.4**
Dolnośląskie (dl)	13.6	14.3	14.4	15.4
Kujawsko-pomorskie (kp)	13.9	14.6	14.8	15.5
Lubelskie (lu)	12.4	12.8	13.0	13.8
Lubuskie (lb)	12.5	13.1	13.6	14.6
Łódzkie (lo)	18.7	19.1	18.8	19.6
Małopolskie (mp)	13.5	13.9	13.9	14.6
Mazowieckie (mz)	12.6	12.8	13.0	13.6
Opolskie (op)	13.1	13.8	13.6	14.6
Podkarpackie (pk)	14.9	15.4	15.6	16.5
Podlaskie (pd)	10.8	11.2	11.4	12.3
Pomorskie (pm)	14.0	14.2	14.3	15.1
Śląskie (sl)	14.9	15.3	15.2	15.9
Świętokrzyskie (sw)	16.3	17.4	17.6	18.4
Warmińsko-mazurskie (wm)	12.9	13.6	13.7	14.5
Wielkopolskie (wp)	15.7	16.3	16.0	16.8
Zachodniopomorskie (zp)	12.6	13.2	13.5	14.5
Min (lódzkie in all years)	**10.8**	**11.2**	**11.4**	**12.3**
Max (podlaskie in all years)	**18.7**	**19.1**	**18.8**	**19.6**
max/min	**1.73**	**1.70**	**1.64**	**1.60**
V (coeficient of variation)	**13.5%**	**13.3%**	**12.5%**	**11.8%**

Source: own elaboration based on ZUS database

As it follows from Table 1 and Map 1, the differentiation is quite significant – although it decreases in time, as in 2012 the value of the absence rate for the voivodeship with maximum value (Łódzkie) was 1.73 times higher than for the voivodeship with the lowest value (Podlaskie), while in 2015 this ratio was 1.6 (the decreasing differentiation is also confirmed by the decreasing coefficient of variation from the last line of the above Table). It is also evident that voivodeships with the lowest absence rate are grouped in the north-eastern

Poland, while the voivodeships with the highest absence rate constitute a belt stretching from north-west to south-east.

Map 1. Regional absence rate in Poland in 2015
Source: own elaboration based on ZUS database

At the same time, there are no significant changes in the rank of the voivodeships in terms of the absence rate. Some voivodeships have not changed their rank at all – in particular Łódzkie, ranked the first in all years surveyed, as well as Podlaskie, ranked the last in all years surveyed. Whenever a change in the rank occurred, it was slight, apart from the Lubuskie voivodeship which systematically improved its rank year by year, from number 14 to number 10 (Figure 2).

The fact that in 2012–2015 no significant changes in the rank of voivodeships occurred allows for assuming that the factors which affect the differentiation of the absence rate are quite stable. Therefore a question arises: what factors contribute to quite significant differences in the absence rate within the territory of one country?

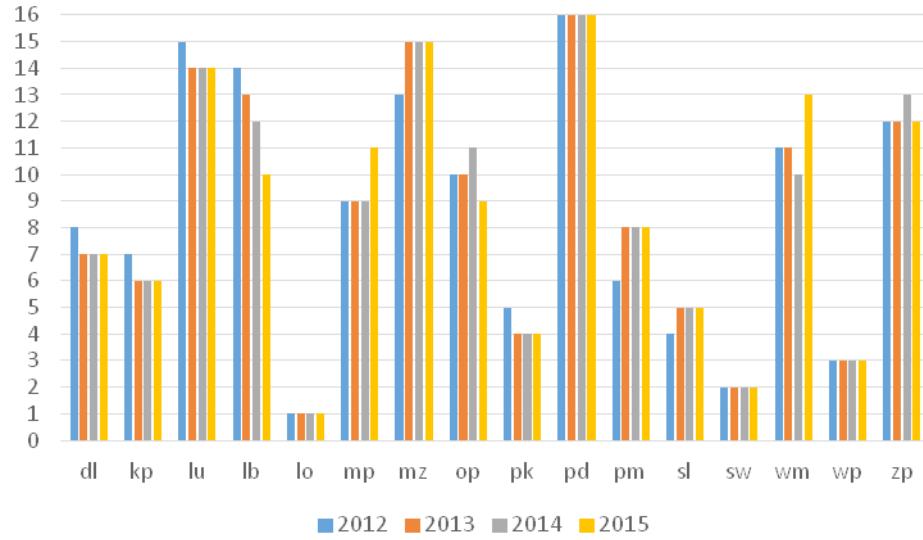

Figure 2. The rank of the absence rate in 4 years (2012–2015)

Source: own elaboration based on ZUS database

5. Factors differentiating the absence rate

5.1. Health factors and the quality of living

It seems that the regional differentiation of the absence rate should mainly depend on the health of the persons insured[4], in accordance with the belief that the reason for the sickness absence should be the sickness of the person insured. Therefore the following hypothesis has been verified first: the better/worse the health of the persons insured, the lower/higher the absence rate.

First of all, variables related to health have been taken into account, but also other variables have been considered, denoting the quality of living, taken from Czapiński, Panek (2015) (i.e. the subjective feelings of the respondents). Out of 18 variables examined in Table 1, it is poor and very poor health that is the main stimulant of high absence rate (correlation coefficient is the highest, $r = 0.31$[5]) – cf. Table 2. The main destimulants of the absence rate are participation in culture ($r = -0.30$), material welfare ($r = -0.29$), leisure ($r = -0.28$) and high level of civilisation ($r = -0.27$). However, it should be noted that all these

[4] The same factor is simultaneously less significant in time, as the health condition is much more diversified in terms of region than it is in terms of time.

[5] What is interesting, the health condition has been assessed as the poorest by the inhabitants of the Łódzkie voivodeship – the region with the highest absence rate.

correlations are statistically insignificant at the standard level of significance, therefore these variables cannot be treated as (statistically) significant determinants of the morbidity level.

Table 2. Correlation between the absence rate and a subjective assessment of conditions and quality of living in 2015

Indicator	Correlation
bad and very bad health*	0.31
nutrition	0.14
education of children	0.01
life stress	–0.05
physical wellbeing	–0.07
psychological wellbeing	–0.08
social capital	–0.10
pathologies	–0.13
social wellbeing	–0.16
material affluence	–0.18
housing conditions	–0.21
use of health care system services	–0.24
living conditions	–0.25
income	–0.26
civilisation level	–0.27
leisure	–0.28
material wellbeing	–0.29
cultural participation	–0.30

* This indicator refers to 2014, because of other data source (***Health and Health Behaviours…***, 2015).

Source: own elaboration based on Czapiński, Panek (2015), *Health and Health Behaviours…* (2015) and ZUS database

However, if we take into account more objective factors reflecting the health condition of the population, then from the variables available in public statistics (both indicators of morbidity according to causes, as well as deaths according to causes were considered) the highest correlation ($r = 0.64$) has been observed between the absence rate and the incidence of malignant cancers (per 100 thousand inhabitants) – cf. Table 3[6].

[6] Also significant, positive correlation has been observed for the deaths of people under the age of 65 due to cardiovascular disease and the deaths of males under the age of 65 due to cardiovascular disease.

Table 3. Correlation between the absence rate and indicators of death and morbidity in 2014

Group	Indicator	Cor
deaths by causes	total deaths due to cancer per 100 thous. population	0.27
	deaths caused by malignant neoplasms per 100 thous. population	0.28
	deaths of people due to cardiovascular disease per 100 thous. population	0.33
	deaths of females due to cardiovascular disease per 100 thous. females	0.33
	deaths of males due to cardiovascular disease per 100 thous. males	0.33
	deaths of people under the age of 65 due to cardiovascular disease per 100 thous. population in this age	0.45*
	deaths of females under the age of 65 due to cardiovascular disease per 100 thous. females in this age	0.39
	deaths of males under the age of 65 due to cardiovascular disease per 100 thous. males in this age	0.46*
	deaths of females due to mammary malignant neoplasm per 100 thous. females	0.23
	deaths of females due to cervical cancer per 100 thous. females	–0.35
	percentage of female deaths due to cervical cancer	–0.45*
	deaths due to mental and behavioural disorders per 10 thous. population	0.00
	deaths due to cancer and cardiovanscular disease per 10 thous. population	0.38
morbidity by causes	diseases of the circulatory system, total	0.07
	neoplasms, total	–0.13
	diseases of the respiratory system, total	–0.30
	suicide per 10 thous. population	0.21
	cancer**	0.64

* Correlation is significant at the 0.1 level; if there are no stars with correlation coefficients – this means that the relationship is statistically insignificant.

** This indicator refers to 2013, because of other data source (Mojapolis database).

Source: own elaboration based on ZUS, GUS and MojaPolis database

5.2. Demographic factors

Demographic factors may affect the absence rate in many ways. Firstly, long-term leaves (translated into high absence rate) are associated with two groups of the persons insured: pregnant women[7] and the elderly with worsening health condi-

[7] It is confirmed by the fact that the highest number of live births in Poland falls to women aged 27 to 31 years (which coincides with the growing tendency for this age shown in Figure 2), as well as by the fact that in the record-breaking year 2008 (taking into account the analysed period: 2005–2014), where the absence rate grew by 6.8% (from 13.3 to 14.2), the highest growth of total fertility rate: by 6.4% (from 1.306 to 1.390) was also noted.

tion. The second factor may be the ageing of the population leading to the necessity to provide care for the elderly.

Table 4. Correlation between demographic factors and the absence rate in 2014

Indicator	Correlation
% of population aged 20–24	–0.32
% of population aged 25–34	–0.49
% of population aged 35–44	+0.12
% of population aged 45–54	–0.29
% of population aged 55–64	+0.25
% of population aged 65+	+0.39
Demographic dependency ratios:	
non-working age population per 100 persons of working age	0.43*
post-working age population per 100 persons of pre-working age	0.33
post-working age population per 100 persons of working age	0.45*

* Correlation is significant at the 0.1 level; if there are no stars with correlation coefficients – this means that the relationship is statistically insignificant.

Source: Own calculations based on ZUS and GUS database.

The research on regional dependencies showed that the share of females aged 25–34 years in the total number of the inhabitants of a given region is negatively correlated with the absence rate ($r = –0.38$ for 2014), which is difficult to explain rationally (as it means that the higher the share of females of this age is, the lower the absence rate appears). However, the regional differentiation of the percentage of the elderly has given an expected, positive (although statistically insignificant) sign of correlation, meaning that the more people aged 55–64 and 65+ years in a given region, the higher the observed absence rate.

5.3. Economic factors

Among the economic factors, mainly the level of income was taken into consideration, both in the objective aspect, as well as the subjective evaluation of the material situation (Table 5).

It follows from Table 5 that none of the above factors is a (statistically) significant determinant of the regional differentiation of the absence rate. The highest correlations were observed for the subjective evaluation of the material situation of a household – if in a given voivodeship the situation has been evaluated as very good, in the same voivodeship a lower absence rate has been noted. What is interesting, a high correlation has also been observed for an average material situation ($r = 0.56$), meaning that the more households evaluate their situation as average, the highest the absence rate is.

Table 5. Correlation between economic determinants of the absence rate in 2014

Group	Indicator	Correlation coeficient
Average monthly available income	total	–0.19
	from hired work	–0.04
	from a private farm in agriculture	–0.29
	from self-employment	–0.19
	from a private farm in agriculture in relation to income per 1 person from self-employment	–0.28
	from social benefits	0.03
	disposable income	–0.20
National economy	average monthly gross wages	–0.13
Subjective evaluation of material situation of household	very good	–0.51*
	rather good	–0.23
	average	0.56
	rather bad	–0.12
	bad	0.05
At-risk of poverty rates in households	legal poverty line	–0.13
	relative poverty line	–0.12
	the substistance minimum	–0.12

* Correlation is significant at the 0.05 level; if there are no stars with correlation coefficients – this means that the relationship is statistically insignificant.

Source: own calculations based on ZUS and GUS database

5.4. Situation on the labour market

Table 6 includes correlations between the absence rate and the indicators characterising the conditions on the labour market.

Table 6. Correlation between the absence rate and the characteristics of employees in 2014

Group	Indicator	Cor.
Level of education	tertiary	–0.29
	post-secondary and vocational secondary	0.21
	general secondary	–0.01
	basic vocational	0.28
	lower secondary, primary and lower	–0.12
Place of work	rural area	0.16
	urban area	–0.16
Property sector	private sector	0.40
	public sector	–0.40

Group	Indicator	Cor.
NACE sector	Agriculture, forestry and fishing (A)	–0.05
	Industry (B–E)	0.43*
	Construction (F)	–0.07
	Wholesale and retail trade, transport, accommodation and food service activities (G–I)	0.08
	Information and communication, Financial and insurance activities, Real estate (J–L)	–0.05
	Professional, scientific and technical activities; administrative and support service activities (M–N)	0.01
	Public administration, defence, education, human health and social work activities (O–Q)	–0.57**
	Arts, entertainment and recreation; other service activities; activities of household and extra-territorial organizations and bodies (R–U)	–0.29
Unemployment	Rate of unemployment	0.11
	Duration of job search	0.44*

* Correlation is significant at the 0.1 level; if there are no stars with correlation coefficients – this means that the relationship is statistically insignificant.

** Correlation is significant at the 0.05 level; if there are no stars with correlation coefficients – this means that the relationship is statistically insignificant.

Source: own calculations based on ZUS and GUS database

Out of all covered characteristics of employees, three are significantly correlated with absence – the share of the persons employed in the industry, the share of the persons employed in public services, and the length of the period of job seeking[8].

The more persons employed in the industry – the higher the absence rate. It definitely explains the lowest absence rates, as three voivodeships with minimum absence rate (Podlaskie, Mazowieckie and Lubelskie) employ at the same time the lowest percentage of people working in the industry. It also explains high absence ratio in Wielkopolska region[9]. While the share of people employed in the industry creates favourable conditions for high absence rate, in the case of public (non-market) services the situation is quite opposite – the higher the percentage of people employed in public services, the lower the absence rate[10]. In particular

[8] Also the percentage of people employed in the public (private) sector has shown a positive (negative) influence on absence: the correlation has been quite high (+0.40/–0.40), however still statistically insignificant.

[9] Interestingly enough, the influence of the percentage of people employed in the industry is positively correlated with some causes of death – in particular, the percentage of deaths of females due to cervical cancer (correlation +0.55), which suggests that this type of job is harmful.

[10] In the public services sector there are no significant correlations with causes of death, which leads to the assumption that there must be other than health-related mechanism of a negative influence of the percentage of people employed in the public services on absence.

Łódzkie is the voivodeship with the lowest percentage of people employed in public services, and with the maximum absence rate. The second and third position in the ranking in terms of absence belong to Świętokrzyskie and Wielkopolskie, which are also voivodeships with a small share of people employed in public services. The negative correlation between absence and the share of persons employed in the public services is also noted for low absence rates: the three voivodeships with maximum share of people employed in the public services (Warmińsko-Mazurskie, Zachodniopomorskie, Lubelskie) are simultaneously voivodeships with the absence rate in 2014 of 10, 13, and 14, respectively.

However, the most surprising results are observed for unemployment. Contrary to the conclusions from the literature, the unemployment rate does not (significantly) affect the regional differentiation of the absence rate in Poland. What is quite significant, is the length of the period of job seeking by the unemployed. The longer that period in a given voivodeship seems, the higher the absence rate is. The threat of long-term unemployment and the perspective of the loss of the unemployment benefit may persuade employees in these regions to use any opportunities to postpone the moment of registration in the labour office as an unemployed person, *inter alia* through prolongation of sick leaves to the maximum extent possible.

6. Summary

The sickness absence rate in Poland changes in time and is significantly differentiated in terms of regions – there is a difference of more than 1.6 times between the voivodeship with the lowest (Podlaskie) and the highest (Łódzkie) absence rate. Simultaneously, the ranking of the voivodeships has not changed much as far as this aspect is concerned[11], which proves that the rank of voivodeships in terms of the absence rate is relatively stable in time (and at the same time it suggests that if there are factors which significantly affect it, then their influence is quite permanent)[12].

Among factors shaping the observed changes there is definitely health condition, which should be the basic determinant for the use of the sick leave. Therefore two groups of indicators reflecting differences in the health condition of the inhabitants of individual voivodeships have been examined. The first group re-

[11] In particular voivodeship with the highest (Łódzkie) and the lowest (Podkarpackie) absence rate in all years examined were ranked 1 and 16, respectively.

[12] Therefore the models created for cross-section data for statistically significant determinants of absence did not significantly differ (in subsequent years) in terms of strength of influence of a given factor on the absence rate. Simultaneously, it should be noted that an attempt of creating a panel model including many determinants of absence failed, as due to high correlation between explanatory variables, their multicollinearity rendered it impossible to assess their significance properly.

lates to a subjective feeling of the respondents as to their poor health condition[13], while the second group relates to objective measures connected with morbidity and mortality. In the second group, the results have shown that the higher the number of deaths of people under the age of 65 due to cardiovascular disease and the deaths of females due to cervical cancer (and in particular the incidence of malignant cancers), the higher the absence rate.

As far as demographic factors are concerned, a relatively high positive correlation between the share of the elderly, as well as demographic dependency ratio and the absence rate has been observed: the older the population of a given voivodeship, the higher the absence rate. To some extent it is understandable when it comes to employees, but the fact that this dependency is also significant for post-working age population per 100 persons of working age suggests that deeper analyses are needed. Thus, it may be a consequence of two various factors. Firstly, some people in post-working age are still employed, which leads to the situation where in voivodeships with high absence rate there may be a different employment structure – a higher percentage of employees in post-working age, thus exposed to higher risk of morbidity. Secondly, the growing rate may determine more frequent sick leaves of employees who have to take care of the sick members of their families.

The third group of factors examined are of economic, or rather material, nature. In this group, a negative significant correlation between the subjective evaluation of material situation of household has been observed – the higher the percentage of people evaluating their material situation as very good, the lower the absence rate[14]. And finally, a group of variables characterising the conditions on the labour market have been examined. The fact quite well confirmed in the literature (which was indicated in the Introduction) is that the absence rate is negatively correlated with the unemployment rate. Such dependency may also be confirmed for Poland – in 2005–2015 the correlation between the absence rate and the unemployment rate was negative, high and statistically significant (which means that the higher/lower the unemployment rate in a given year was, the lower/higher absence rate in that year was noted). Significant, negative correlations in that period have also been observed for the majority of voivodeships. However, this dependency cannot be confirmed as far as regional differentiation of the absence rate is concerned: it is not so, that the voivodeships with high/low unemployment rates at the same time have low/high absence rate. In terms of voivodeships, the unemployment rate has no significant correlation with the absence rate[15].

[13] Precisely, it applied to respondents who selected the answer that they evaluate their health condition as "poor and very poor".

[14] Interestingly enough, objective measurement of affluence, i.e. the amount of remuneration, has not shown significant dependency.

[15] While the applicable correlation has been positive (sic!), it has proven statistically insignificant at standard significance levels.

Unemployment is therefore an important factor shaping absence behaviours of the unemployed within a given area, in time. Whether the voivodeship has high or low ratio of sickness absence, when the unemployment rate increases, most often the number of sick leaves is reduced, and when the conditions on the labour market improve, employees are more prone to use the sick leaves. Unemployment does not affect regional differentiation, which, as indicated above, is determined by factors relatively stable in time, and the cyclical nature of this phenomenon excludes it from this group.

References

Bartkowski J. (2004), *Analiza absencji chorobowej w pracy na podstawie danych GUS i ZUS*, [in:] E. Giermanowska, M. Racław-Markowska (eds.), *Absencja chorobowa w Polsce*, Instytut Spraw Publicznych, Warszawa.

Czapiński J., Panek T. (eds.) (2015), *Social Diagnosis*, www.diagnoza.com [accessed: 9.07.2016].

Giermanowska E., Racław-Markowska M. (eds.) (2004), *Absencja chorobowa w Polsce*, Instytut Spraw Publicznych, Warszawa.

GUS database, https://bdl.stat.gov.pl/BDL/start [accessed: 15.06.2016].

Health and Health Behaviours of the Inhabitants of Poland in Light of the EHIS 2014 Survey (2015), Central Statistical Office of Poland (GUS), Warsaw.

Health and Healthcare in 2014 (2015), Central Statistical Office of Poland (GUS), Warsaw.

Helgesson M., Johansson B., Nordqvist T., Lundberg I., Vinga E. (2015), *Sickness absence at a young age and later sickness absence, disability pension, death, unemployment and income in native Swedes and immigrants*, "European Journal of Public Health", vol. 25, no. 4, pp. 688–692.

Hytti H. (2006), *Why are Swedes sick but Finns unemployed?*, "International Journal of Social Welfare", no. 15, pp. 131–141.

Johns G. (2008), *Absenteeism and presenteeism: Not at work or not working well*, [in:] C.L. Cooper, J. Barling (eds.), *The Sage handbook of organizational behaviour*, vol. 1, Sage, London.

Leigh J.P. (1985), *The effects of unemployment and the business cycle on absenteeism*, "Journal of Economics and Business", no. 37, pp. 159–170.

Lidwall U., Marklund S. (2011), *Trends in long-term sickness absence in Sweden 1992–2008: the role of economic conditions, legislation, demography, work environment and alcohol consumption*, "International Journal of Social Welfare", vol. 20, pp. 167–179.

Mastekaasa A. (2005), *Sickness absence in female- and male-dominated occupations and workplaces*, "Social Science & Medicine", vol. 60, pp. 2261–2272.

Mechanic D. (1986), *Illness behaviour: an overview*, [in:] S. McHugh, T.M. Vallis (eds.), *Illness behavior: a multidisciplinary model*, Plenum Press, New York.

Mojapolis database, https://www.mojapolis.pl/ [accessed: 15.06.2016].

National Health Programme 2007–2015, http://www.mz.gov.pl/zdrowie-i-profilaktyka/narodowy-program-zdrowia/npz–2007–2015/ [accessed: 15.06.2016].

Pęciłło M. (2015), *Wpływ warunków pracy na absencję chorobową kobiet i mężczyzn*, "Bezpieczeństwo Pracy. Nauka i Praktyka", no. 2, pp. 8–10.

Pęciłło-Pacek M. (2014), *Zależności pomiędzy absencją chorobową pracowników produkcyjnych a psychospołecznym środowiskiem pracy*, "Bezpieczeństwo Pracy. Nauka i Praktyka", no. 11, pp. 13–16.

Piha K., Martikainen P., Rahkonen O., Roos E., Lahelma E. (2007), *Trends in socioeconomic differences in sickness absence among Finnish municipal employees 1990–99*, "Scandinavian Journal of Public Health", vol. 35, pp. 348–355.
Selander J., Buys N. (2010), *Sickness absence as an indicator of health in Sweden*, "International Journal of Disability Management", no. 5(2), pp. 40–47.
Shapiro C., Stiglitz J. (1984), *Equilibrium unemployment as a worker discipline device*, "American Economic Review", no. 74, pp. 433–444.
Szubert Z. (2014), *Absencja chorobowa w Polsce po transformacji społeczno-gospodarczej*, "Medycyna Pracy", no. 65(1), pp. 73–84.
Szubert Z., Merecz-Kot D., Sobala W. (2009), *Stres zawodowy a ryzyko absencji chorobowej na stanowiskach obsługi interesantów*, "Medycyna Pracy", no. 60(4), pp. 259–271.
Szubert Z., Sobala W. (2003), *Absencja chorobowa w przedsiębiorstwie po restrukturyzacji*, "Medycyna Pracy", no. 54(1), pp. 9–15.
Yaniv G. (1991), *Absenteeism and the risk of involuntary unemployment: A dynamic analysis*, "Journal of Socio-Economics", no. 20(4), p. 359–372.
ZUS database, http://www.zus.pl/default.asp?p=5&id=5 [accessed: 15.06.2016].
ZUS Statistical Portal database, http://www.psz.zus.pl/Default.aspx [accessed: 15.06.2016].

Determinanty zróżnicowania absencji chorobowej pracowników

Streszczenie: Celem artykułu jest zbadanie zmian wskaźnika poziomu absencji chorobowej w Polsce w latach 2005–2015 (okres, dla którego dostępne są dane statystyczne umożliwiające obliczenie tego wskaźnika) oraz przede wszystkim jego zróżnicowania terytorialnego w latach 2012–2015. Pytanie badawcze sformułowano następująco: „Jakie czynniki wpływają na zmiany w poziomie wskaźnika absencji chorobowej w czasie na poziomie ogólnokrajowym i jego zróżnicowanie w poszczególnych województwach w Polsce?". W analizach uwzględniono czynniki zdrowotne (między innymi samoocenę stanu zdrowia, subiektywną ocenę warunków i jakości życia oraz poziom śmiertelności z zachorowalności na niektóre choroby) i społeczno-ekonomiczne (strukturę ludności według wieku i płci, wysokość dochodów gospodarstw domowych, subiektywną ocenę sytuacji materialnej, poziom ubóstwa, stopę bezrobocia, strukturę zatrudnienia według klasyfikacji NACE oraz strukturę ludności według poziomu wykształcenia), które mogą wpływać na zmiany w czasie i zróżnicowanie przestrzenne poziomu absencji chorobowej.

Słowa kluczowe: absencja, wskaźnik absencji chorobowej, rynek pracy

JEL: J88

Received: 2016-08-14; verified: 2016-12-19. Accepted: 2017-12-20