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ESTIMATING THE SHARE OF SICKNESS ABSENCE COSTS IN EUROPE'S GDP – A COUNTRY, GENDER AND TIME PERSPECTIVE

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ESTIMATING THE SHARE OF SICKNESS ABSENCE COSTS IN EUROPE'S GDP – A COUNTRY, GENDER AND TIME PERSPECTIVE

ABSTRACT

The purpose of the article. The aim of the study was to calculate and evaluate the costs of employee sickness absence in European countries over the period 2006–2020. An additional objective was to analyse the sensitivity of the development of absenteeism costs depending on the changing level of the discount rate used in economic evaluation analyses.

Methodology. The estimation and subsequent assessment of absenteeism of working-age people costs was based on human-capital approach and was carried out retrospectively using the morbidity, top-down approach, based on aggregated epidemiological data. As a measure of production loss volume, GDP per working person was adopted.

Results of the research. The study indicated that there is variation in the cost of sickness absence across European countries, but no clustering relationship was identified from a geographic perspective. In addition, SACS is in the range of 1,9% – 2,1% in all countries in 2006 prices.

Keywords: cost-of-illness studies, indirect costs of illness, absenteeism, human capital approach.

JEL Class: H51, E60, I18, J16, C01.

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INTRODUCTION

Absence from work due to an employee's illness – sickness absenteeism – is an extremely complex and multidimensional phenomenon that affects not only the functioning of the workplace but also the economy as a whole. Literature studies point to multifaceted factors determining the occurrence of absenteeism (Antczak and Miszczyńska, 2021). Moreover, it has a real impact on the functioning of the economy and can be measured using a number of direct health care cost measurement methods, including the human capital approach, the friction cost approach and the willingness-to-pay method. All of these methods quantify the value of lost GDP lost. In addition to the value of GDP per worker itself, it is influenced by the value of the discount rate, which is applied at different levels in different European countries. Therefore, the aim of this article was to estimate and assess the evolution of the cost of employee sickness absence using the human capital approach and to analyse the sensitivity of the value of the share of unproduced GDP due to absenteeism in total GDP depending on the value of the discount rate adopted. The study will be conducted over the period 2006–2020 with a gender perspective.

1. COST OF ILLNESS ESTIMATION METHODS

An aspect that provides a starting point for research related to morbidity and its impact on the economy is sickness absence. Health, which together with education creates human capital, is simultaneously a key factor that determines economic growth (Acemoglu and Johnson, 2007). According to the human capital theory, created by the Nobel Prize winner G. S. Becker (Schultz, 1961), human capital is used to generate GDP. At the same time, sickness absence, which is the immanent result of a disease (Kujawska, 2015), directly leads to under-utilization of the individual's capital. This leads to decreasing productivity and creation of non-produced GDP. Health, being an essential component of human capital, supports the workers' productivity by enhancing physical capacity and mental capabilities (Bloom et al., 2022). Thus, the disease causes a reduction in work resources and limited productivity. It may also result in disabilities or premature death. This leads to two types of consequences. Firstly, household incomes of the sick and their informal caregivers are decreasing. Secondly, enterprises employ less than one factor of production in the short term, which leads to other factors not being utilised, and above all capital. As a result, the company's production volume decreases. Of course, replacements and hiring new employees, if possible, over time lead to the initial production volume. It does not change the fact that the production that would have been made by the sick, in the case they had not got sick, remains unprocessed. Thus it represents a loss that serves as a means of measuring the cost of the disease for the economy and society (Nojszewska, 2016).

Many of the studies that link morbidity to economy-level growth factors focus just on cost measurement, which includes the dollar value of the cost of a certain diseases (Javaid et al., 2008). The identification and measurement of the cost of disease is done through cost-of-illness (COI) studies. COI methods analyze all costs associated with the occurrence of a diseases and provide information on the economic burden of disease from three different perspectives: society, the public payer, and the individual (Brodszky et al., 2019). As Drummond et al. (2005) emphasises, they not only support the understanding of the health problem, but above all provide the cost estimates necessary for economic evaluations by providing the structure and the main cost components. These costs are divided into three basic categories: indirect, direct and intangible costs (Łyszczarz and Nojszewska, 2017). Indirect costs are costs created due to absenteeism, presenteeism, premature death, incapacity to work, absenteeism of informal caregivers and the presenteeism of informal caregivers. Zemedikun et al. (2021) underlines that the cost approach involves not only the mere allocation and estimation of costs in the three groups mentioned, but also considering them from the perspective of the entity bearing the cost (societal, health system, industry, individual perspective). Obviously, depending on the type of entity, the categories of costs included in the estimates will vary. However, COI studies are carried out from the point of view of different approaches and perspectives and are not limited to the cost-based view only. From epidemiological point of view, COI studies can be done through prevalence-based or incidence-based approach. They are defined respectively as estimating costs for all existing cases in a given period or as assessing only the number of new cases in a given period (Zemedikun et al., 2021). COI can be done retrospectively (analysis of previously collected data) or prospectively (data are collected during patient follow-up). Prevalence and incidence-base COI studies can be conducted in both a prospective and retrospective manner (Tarricone, 2006). When conducting a COI study, it is also necessary to decide on one of three approaches: top-down, bottom-up or econometric (Jo, 2014).

The problem of estimating economic losses (in other words lost GDP) caused by the disease is widely discussed both in the context of its determinants and the connection with human capital (Nicholas et al., 2019). The human capital approach – HCA is, apart from the friction costs approach – FCA and willingness-to-pay method – WTP (Jo, 2014), the most important method of estimating the costs of lost GDP. Other methods include (Soekhai et al., 2019): health status assessment, Washington panel approach, contingent valuation method, or choice experiment. In practice, however, the first two methods are most commonly used.

2. AN OVERVIEW OF EUROPEAN PATTERNS IN LOST PRODUCTIVITY ESTIMATION METHODS

Many researchers involved in estimating the costs of diseases emphasize the validity of using such calculations from the point of view of guiding national health policy. In the perspective of health policy making, the analysis of productivity losses due to illness plays a very important role. These costs can be defined as "costs associated with loss of production and replacement costs due to illness, incapacity (temporary or permanent) and premature death" (Krol et al., 2013). The most commonly analysed costs are direct medical costs. However, Puddu et al. (2016), Pederzoli and Gandini (2008) reiterate in their research that the assessment of costs, including indirect costs, not only effectively drives health policy planning, but also contributes to the efficient allocation of resources (Koopmanschap et al., 1995). However, in European countries, but not only, there are no rigid, common guidelines concerning the use of specific methods of cost estimation. The choice as to the method used for estimating health economic costs, such as the direct, indirect or intangible costs of illness, is very often dictated by government recommendations. These recommendations relate not only to the method itself, but also to the perspective applied to their calculation. Country's recommendations also differ as to the categories of costs taken into consideration. Table 1 presents the details in question.

Table 1. Country-specific cost estimation

Country	Perspective on costs
Austria	To be justified during research (Health care payer/Societal/SHI).
Belgium	Health care payers
Bulgaria	No guidlines avaliable
Czech Republic	Health care payers
Croatia	Public payer (according to the Croatian Institute for Health Insurance)
Cyprus	No guidlines avaliable
Denmark	Socio-economic
England	The NHS and personal social services
Greece	No guidlines avaliable
Finland	Societal

Estonia	Health care
	Additionally societal
Latvia	Health care
	Additionally societal
Lithuania	Health care
	Additionally societal
France	Collective perspective. All the resources used
Malta	No guidlines avaliable
Luxembourg	No guidlines avaliable
Germany	Social Health Insurance (SHI) insurant primarily
Hungary	n/a
Ireland	Public health care and social care system
Italy	Health care
Netherlands	Societal
Norway	Societal
Poland	Public health care payer and/or the patient.
Portugal	Societal
Romania	No guidlines avaliable
Slovak Republic	Health care payers
Spain	NHS + societal perspective
	Societal +OSTEBA
	CATSALUT + societal perspective
Slovenia	Health insurance but societal perspective is also approved
Sweden	Societal
Switzerland	Health care

Source: own elaboration based on SBU (2015).

Most countries recommend the use a societal perspective when assessing productivity loss due to employee illness. In the majority of countries, the costs that are recommended for economic analyses are direct costs, in particular, direct medical costs. In some cases, a deeper analysis based on direct non-medical costs, or indirect and intangible costs, is also acceptable. Interestingly, however, despite the use of a social perspective being indicated in country-specific guidelines, it is not fully specified how and through which cost categories lost productivity should be estimated. This is very evident in the differences in the cost categories captured. In some countries, despite the recommended social perspective, only direct costs are analysed (e.g. Norway), while in Portugal both indirect and direct costs are already included. The methods most commonly used for this assessment of lost productivity are: HCA, FCA and WTP. However, it should be emphasised that the first two methods (HCA and FCA) are the dominant approaches in indirect cost analysis (Neubauer et al., 2006). Table 2 presents details in question.

Table 2. 'Default' method of lost productivity measurement

Country	HCA	FCA	WTP	Other method	Type of the healthcare system
Austria	X	X			Universal Health Insurance - traditionally shaped systems
Belgium	X	X			
France	X	X			
Germany	X	X (in sensitivity analysis)			
Luxembourg	No guidlines avaliable				
Netherlands		X			
Switzerland				X	
Finland				X	National Healthcare - traditionally shaped systems
England	X				
Ireland				X	
Bulgaria	No guidlines avaliable				Universal Health Insurance - transformed systems
Czech Republic	X				
Croatia	X				
Estonia	X				
Hungary	X	X (for sensitivity analysis)			
Lithuania	X				

Poland	X	X (for sensitivity analysis)			
Slovak Republic	X				
Slovenia	X				
Romania	No guidlines avaliable				
Cyprus	No guidlines avaliable				National Healthcare - transformed systems
Denmark	X	X			
Latvia	X				
Greece	No guidlines avaliable				
Italy	X				
Malta	No guidlines avaliable				
Norway	X	X			
Portugal			X (CVM)		
Spain				X	
Sweden	X	X			

Source: own elaboration based on: Cleemput et al., 2015; Jiang et al., 2022; Lotrič Dolinar et al., 2020; Lublóy, 2019.

The choice of the most appropriate approach for valuing productivity loss has been the subject of much discussion in the literature (Bloom et al., 2022; Rodríguez-Sánchez et al., 2022; Zemedikun et al., 2021). The analyses were carried out in specific geographical areas or even countries but mostly based on specific diseases rather than disease groups. A study on the analysis of the methods used in chosen group of countries was carried out by the Mennini and Giotto (2022). They investigated the frequency of use of HCA and FCA methods in European countries. The authors found out that HCA-based analyses are most common in European countries, the only exception were the Netherlands, where FCA is more commonly used. The literature also raises the issue that the HCA and FCA methods used give different final values. Researchers argue that, as one method overestimates and the other underestimates the results in some way, it would be best to carry out each analysis in two ways and complement it with a sensitivity analysis.

3. DATA AND METHOD

3.1. Data

To analyze the share of costs of sickness absence (abbr. SACS) in Gross Domestic Product (GDP), the authors used data from the WHO (World Health Organization), OECD (Organization for Economic Co-operation and Development), National Central Banks and WB (World Bank). From the OECD, the authors obtained data for the size of employment in thousands of people: total and separately for men and women (OECD, 2023). The authors downloaded data on days of absenteeism from work due to illness from the WHO, i.e., the European Health for All database (World Health Organization, 2022). In turn, we obtained the number of working days (Monday to Friday) excluding public holidays (1990–2020 or 1995–2020) from the Working Group on General Economic Statistics National Central Banks (European Comm, 2022). The values for GDP expressed in current international dollars, converted by purchasing power parity (PPP) conversion factor were retrieved from the International Comparison Program, World Bank (World Bank, 2023). The calculation and analysis was carried out on data representing a consistent and comparable (spatial and temporal) set of information, i.e. for 14 time periods (the years from 2006 to 2020) and 25 European countries: Austria (AT), Belgium (BE), Croatia (HR), Czechia (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (GR), Hungary (HU), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Netherlands (NL), Norway (NO), Poland (PL), Portugal (PT), Romania (RO), Slovak Republic (SK), Slovenia (SI), Spain (ES), Sweden (SE), United Kingdom (UK).

The authors obtained data for discount rates and information for sensitivity analysis from health economic evaluation guidelines of countries in question. Table 3 presents discount rates and sensitivity analysis recommendations. All data used in the study are open access.

Table 3. Discount rates and sensitivity analysis recommendations (2006–2020)

Country	Discount rate value	Sensitivity analysis	
		Lower bound	Upper bound
Austria	0,03	0	0,05
Belgium	0,03	0	0,05
Croatia	0,05	0	0,1
Czechia	0,03	0	0,05
Denmark	-	-	-

Estonia	0,05	-	-
Finland	0,03	-	-
France	0,04	0,03	0,06
Germany	0,03	0	0,1
Greece	-	-	-
Hungary	0,037	-	-
Italy	0,03	0	0,05
Latvia	0,05	-	-
Lithuania	0,05	-	-
Luxembourg	-	-	-
Netherlands	0,04	-	-
Norway	0,04	-	-
Poland	0,05	0	0
Portugal	0,05	-	-
Romania	-	-	-
Slovak Republic	0,05	-	-
Slovenia	0,03	0	0,08
Spain	0,03	0	0,05
Sweden	0,03	0	0,05
United Kingdom	0,035	0,02	0,02

Source: own elaboration based on Williams et al. (2023).

3.2. Method

The estimation and subsequent assessment of morbidity costs was based on the cost-of-illness method (Jo, 2014; Nojszewska, 2016). The analysis was carried out retrospectively using the morbidity, top-down approach, based on aggregated epidemiological data (Jo, 2014). The authors analysed costs of absenteeism of patients. The costs of absenteeism of informal caregivers were not taken into account. In addition, indirect costs were estimated on the basis of data concerning patients according to their place of living.

The method of human capital was used to determine indirect costs. This method assumes that a disease makes it impossible to use the potential inherent in the human capital of sick people, which results in a decrease in productivity due to absenteeism, presenteeism, premature death, incapacity to work, absenteeism of informal caregivers and the presenteeism of informal caregivers. However, this study was based only on absenteeism of patients.

As a measure of production loss volume, GDP per working person was adopted (GDP_{wp}). This measure allows for the use of two factors of production (labour and capital) in the production function, which corresponds to the analysis of the production volume in the economy and the analysis of economic growth. Moreover, it also takes into account the fact that work is not the only production factor, and the employee's illness and absenteeism may prevent the activation of other complementary production factors (Ernst&Young, 2013). In other words, a measure of GDP per one of the working person takes into account the lost productivity not only of the work itself, but also of other factors (e.g. a machine that is not used during the employee's illness to the same extent as when the employee is healthy) (Ernst&Young, 2013). The use of productivity measures in estimating indirect costs takes into account the decreasing marginal labour productivity. The is why, the value of 0,65 was adopted here in accordance with the position presented by the European Commission for EU-15 countries over the period of 1960 to 2003 (Nojszewska, 2016). Thus, the application of the productivity measure without taking into account the adjustment related to the decreasing labour productivity would inflate indirect costs (Nojszewska, 2016). Therefore all the estimated categories of indirect costs will be calculated on the basis of the modified *productivity unit* (PU) calculated according to the formula:

$$PU = GDP_{wp} * 0,65$$

In addition, indirect costs must be discounted with a nationally determined interest rate in line with national regulations concerning health technology assessment. The value of lost production is discounted, which applies to the periods following the year in which the event causing the loss of productivity occurred, and concerns costs related to premature deaths and inability to work for more than one year (Nojszewska, 2016). The costs of absenteeism of patients was determined on the basis of the number of days per year of absence from work due to sickness and confronted with productivity unit and discounted according to discount rates for economic evaluations.

Spatiotemporal analysis of SACS in GDP in European Countries over time from 2006 to 2020 was carried out using basic statistical measures, average rate of change (World Bank, 2022) and global Moran’s I statistics (Anselin and Florax, 1995). Differences between the costs of men and women were verified using the Mann-Whitney U test (Nachar, 2008). The classification of countries was carried out on the basis of quartiles, i.e., the fourth class boundaries (with the lowest costs) were determined by the minimum and the first quartile, the third were determined by the first quartile and the median, the second were determined by the median and the third quartile, and finally the first were determined by the third quartile and the maximum (Kukuła and Bogocz, 2014). In the article, the authors used SPSS Statisctis v.20 and ArcMap v.10.8.2.

4. RESULTS AND DISCUSSION

In 2006, the Czech Republic (21,1), Sweden (19,0), Norway (17,2), Greece (16,5), Germany (13,3) and Belgium (13,3) had the highest sickness absenteeism in terms of days per worker, with the average for the countries analyzed being 11,9 days of absenteeism per worker. The lowest absenteeism rate characterized the UK (5,5), Portugal (7,8), Latvia (8,3) and France (8,4). In 2020, Germany (20,2), the Czech Republic (20,1), Slovakia (16,9), Norway (16,8), Sweden (15,6) and Poland (15,5) had the highest sickness absence rate. The average for the countries surveyed was higher than in 2006, at 12,6 days per worker. On average, from 2006 to 2020, Germany (17,3), Norway (16,7), the Czech Republic (16,1), Sweden (15,4), Greece (14,4), Poland (13,8) and Slovakia (13,4) had the highest sickness absence per employee. The average absenteeism for the years studied was 11,4 (Chart 1).

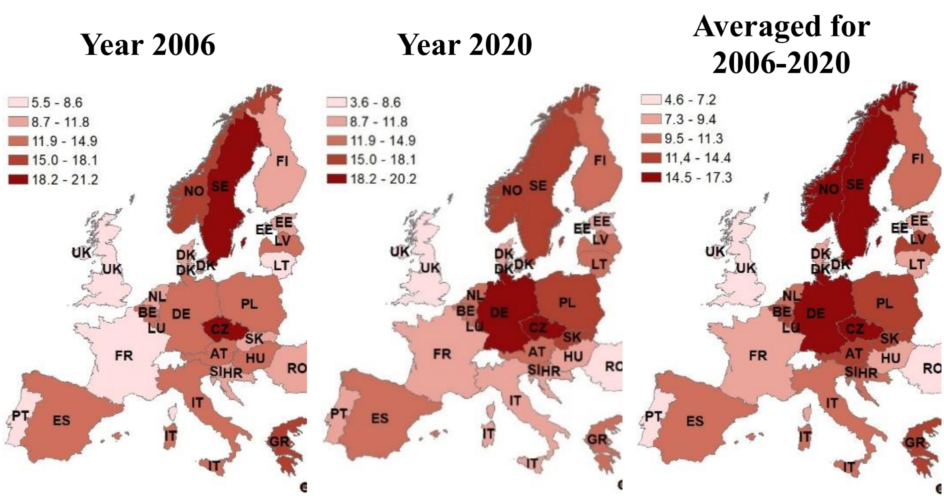

Chart 1. Absenteeism from work due to illness (days per employee per year)

Source: own elaboration based on World Health Organization (2022) in ArcMap 10.8.2.

Based on the statistics in Table 4, there is a higher share of sickness absence costs in women's GDP (M=3,3%) than in men's (M=2,7), also higher than the average level of the share of costs by 0,4 percentage points than on average in the group of countries surveyed (M=2,9%). Moreover, the positive value of Kurtosis and the high values of the coefficient of variation (exceeding the all-encompassing value of 10%) indicate the differentiation of countries, i.e., the presence of areas with moderately high and low values of SACS in GDP (more extreme outliers than in a normal distribution) and significant differences in terms of the variable during the period under study. In turn, the value of the Moran's spatial statistic indicates a tendency for countries with similar cost values to cluster – this is particularly evident and statistically significant with regard to the share of female sickness absence costs (MI=0,36**).

Table 4. Descriptive statistics of share of sickness absence costs in GDP (averaged over years 2006–2020) [in %]

	Total	**Males**	**Females**
Mean (M)	2,9	2,7	3,3
Median (Me)	2,8	2,7	3,2
Standard Deviation (SD)	0,9	1,0	1,2
Skewness (S)	0,3	0,3	0,2
Kurtozis (K)	0,05	0,7	0,04
Minimum (Min)	1,2	0,7	1,0
Maximum (Max)	4,9	5,1	5,8
Coefficient of Variation (CV)	30,1	38,3	36,4
Morans'I (MI)	0,07*	-0,06	0,36**

Note: significance levels: $\alpha = 0.10$*, 0.05**, 0.01***;

Source: own study.

Overall, the share of sickness absenteeism costs in GDP increased during the period analyzed (by an average of 0,02% from year to year between 2006 and 2021). In contrast, an average annual decrease in costs was observed for male absenteeism (by 0,3% from year to year). In contrast, for women, the cost of sickness absenteeism increased steadily (by 0,52% year on year), and the growth rate was 0,5 percentage points faster than for countries overall and 0,8 percentage points faster than for men. Nevertheless, fluctuations in the formation of the SACS were recorded during the period under study (Chart 2).

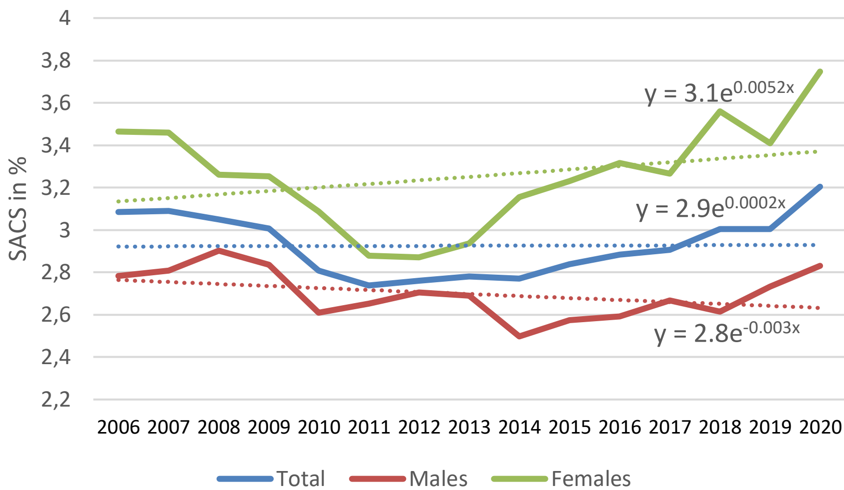

Chart 2. SACS in GDP in time span 2006–2020 (averaged over countries) [in %]

Source: own study based on a database in Table 1.

The analysis carried out shows that countries do group together, but separately for women and men. Thus, regional differences were observed from a time and gender perspective. It was also observed that inequalities in the magnitude of costs widened over the period analysed.

On average, Germany (4,5%), Norway (4,3%), the Czech Republic (4,2%), Sweden (4%), Greece (3,7%) and Poland (3,6%) had the highest absenteeism costs between 2006 and 2020. The lowest costs were incurred by the UK (1,2%), Romania (1,8%), Portugal (1,9%), France (2,2%), Denmark (2,2%), Estonia (2,4%) and Hungary (2,4%), as shown in Chart 3(c). During the period studied, significant differences were noted in the development of the level of costs depending not only on countries, but also on gender. The Mann-Whitney U test (MWU), which is used to compare differences between two independent groups when the dependent variable is either ordinal or continuous, but not normally distributed for males and females' SACS indicated significant differences in the amount of sickness absence costs incurred (MWU=216,0***). Thus, for males, the highest costs (on average over the entire study period) were recorded in Germany (4,9%), Greece (4,4%), Lithuania (3,6%), Estonia (3,5%), Norway (3,4%) and Austria (3,3%). For women, the highest cost of absenteeism as a share of GDP was in the Czech Republic (5,3%), Norway (5,2%), Sweden (5,1%), Poland (4,7%), Germany (4%) and Slovakia (3,9%). Moreover, important differences in the development of abortion costs were also noted between years, The difference in 2006 versus 2020 between the share of total costs in GDP was statistically significant, MWU=222,0*. By gender, in 2006 the MWU test value was 200,0*, and in 2020 MWU=177,0***. A pattern of widening inequalities in the size of costs over time was observed. In 2006, the average share of absenteeism costs was 3,1%, and the highest SACS characterized the Czech Republic (5,5%), Sweden (4,9%), Norway (4,4%), Greece (4,3%), Germany (3,5%) and Belgium (3,4%). The lowest cost was observed in the UK (1,4%), Portugal (2,0%), France (2,2%), Latvia (2,2%), Romania (2,3%), Denmark (2,4%) and Luxembourg (2,5%). In the year in question, with respect to men, the average share of absenteeism costs stood at 2,8%, while with respect to women it was higher at 3,5%. This year, the highest SACS for men was characterized by Greece (4,6%), the Czech Republic (4,4%), Estonia (4,2%), Sweden (3,7%), Norway (3,5%) and Germany (3,4%). In the case of women, it was the Czech Republic (6,9%), Sweden (6,3%), Norway (5,3%), Hungary (4,4%), Italy (4,2%), and Poland (3,9%) that achieved the highest share of women's sickness absence costs in GDP. The lowest shares in 2006 were recorded by Romania (1,1%), UK (1,3%), Portugal (1,7%), and in the case of women were, for example: Estonia (1,2%), Latvia (1,5%) and also UK (1,6%), as shown in Chart 3(a). In contrast, in 2020, the average cost level was 3,2%, and the highest overall cost of absenteeism was observed in Germany (5,2%), the Czech Republic (5,2%), Slovakia (4,4%), Norway (4,3%), Sweden and Poland (4,0% each, respectively). In contrast, the lowest absenteeism costs were achieved by the UK (0,9%), Romania (1,7%), Denmark and Austria (2,3% each), France, Portugal and Hungary (2,4% each). For men, the average cost of absenteeism in 2020 was 2,8%, the highest achieved by Germany (5,1%), Latvia (4,8%), the Czech Republic (4,1%) and Slovakia (3,9%), among others. For women, it was the Czech Republic (6,6%), Germany (5,4%) Norway (5,2%) and Poland (5,0%), with an average of 3,7%. The lowest sickness absence costs for men in 2020 affected, among others, Romania and the UK (0,7% each), Denmark (1,8%), and Portugal and France (1,9% of GDP each). In the case of women's absenteeism, the lowest cost share in GDP this year was recorded by the UK (1,2%), Latvia (1,8%), Estonia (2,1%), Denmark (2,7%) and France (2,8%), as shown in Chart 3(b), among others.

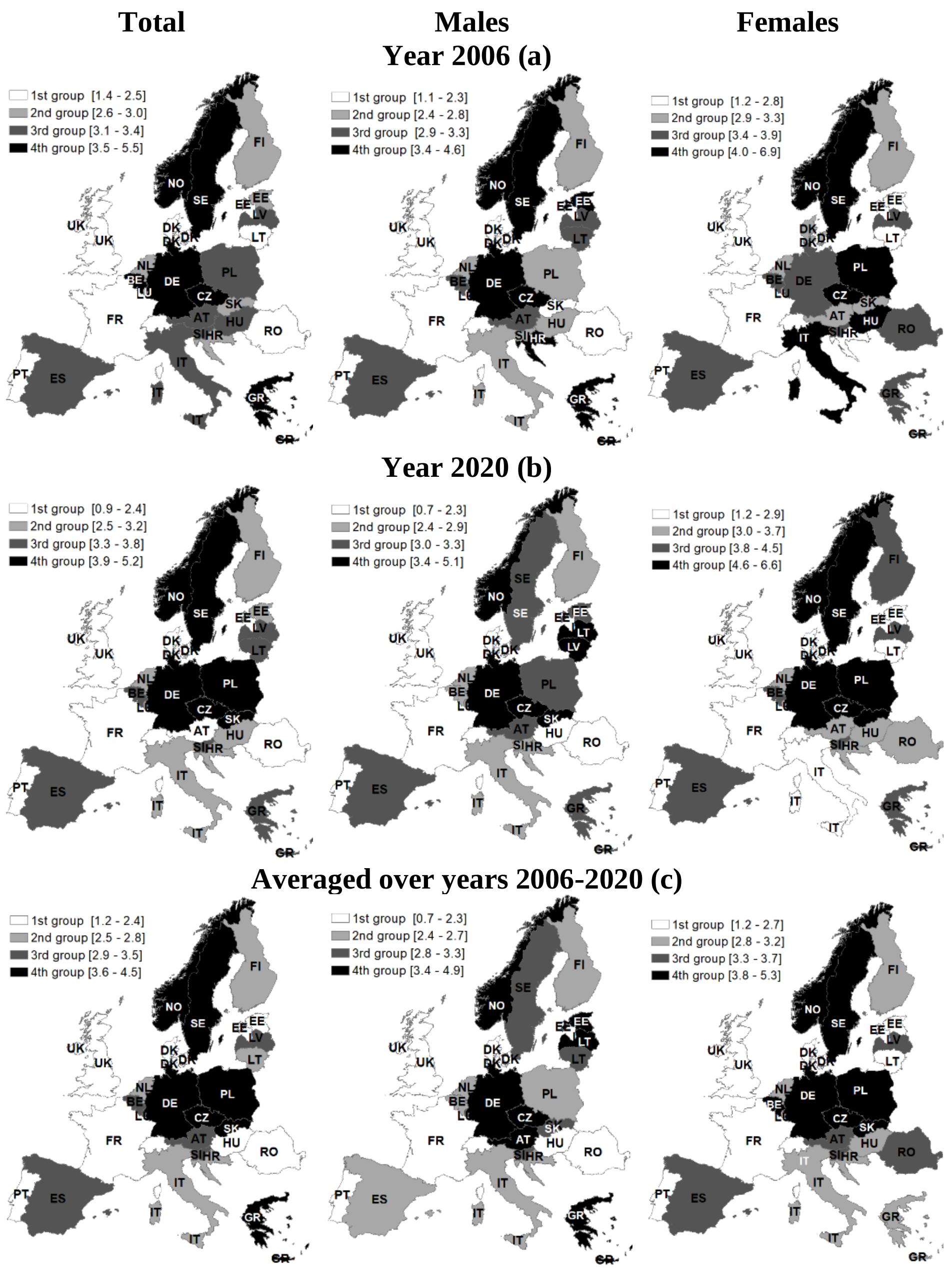

Chart 3. SACS in GDP in 2006, 2020 and averaged over years in European countries [in %]

Source: own elaboration in ArcMap 10.8.2.

During the period under study, the fastest annual growth in the share of absenteeism costs in GDP was recorded in Germany (by 2,9% per year), Latvia (2,5% year-on-year), Luxembourg (1,7% year-on-year), Portugal and Poland (by 1,3% respectively annually). The largest annual decrease in costs took place in Romania (by 3,1% from year), Austria (by 2,8% p,a,), Italy (by 2,6% p,a,), in Hungary (by 2,5% year on year) and in the UK (by 2,4% year on year). The rate of increase in women's cost share was significantly faster than the rate of increase in men's absenteeism costs (MWU=212,0**). The annual growth in the share of women's absenteeism costs took place in most of the countries analyzed. Female absenteeism costs grew fastest in Germany (by 6% year-on-year), Latvia (by 5% year-on-year), Estonia (by 3,5% year-on-year), Croatia (by 2,6% year-on-year) and Poland (by 1,8% year-on-year). The fastest growth in men's absenteeism costs was recorded in Luxembourg (by 1,9% year-on-year) and Germany (by 1,2% year-on-year). The fastest decline in male absenteeism costs was observed in Croatia (by 3,3% year-on-year), the UK (by 2,8% year-on-year) and in Estonia (by 2,6% year-on-year). In contrast, women's sickness absence costs fell sharply in Romania (by 3,2% year-on-year), Italy (by 3,0% year-on-year) and HU (by 2,9% year-on-year), as shown in Chart 4(a).

In 2020, relative to 2006, the largest increases in costs were in Slovakia (by 69%), Latvia (by 52%), Germany (by 51%), Luxembourg (by 27%) and Poland (by 25%). For men's absenteeism costs, the largest increases were in Latvia (up 70%), Slovakia (up 67%), Germany (up 49%), and Luxembourg (up 27%). In contrast, Estonia, Slovakia, Germany, Finland, Croatia and Poland showed the largest increases in women's sickness absence costs (from 28% in Poland to 85% in Estonia, in 2020 for 2006). The largest decreases in costs were observed in the UK (by 35%), Romania and Austria (by 28%) and Hungary (by 26%). Sickness absence costs for men fell significantly in the UK (by 43%), Romania (by 35%), and Croatia (by 29%), while for women, the largest declines were seen in Hungary (by 32%), Italy (by 31%) and the UK (by 29%), as shown in Chart 4(b).

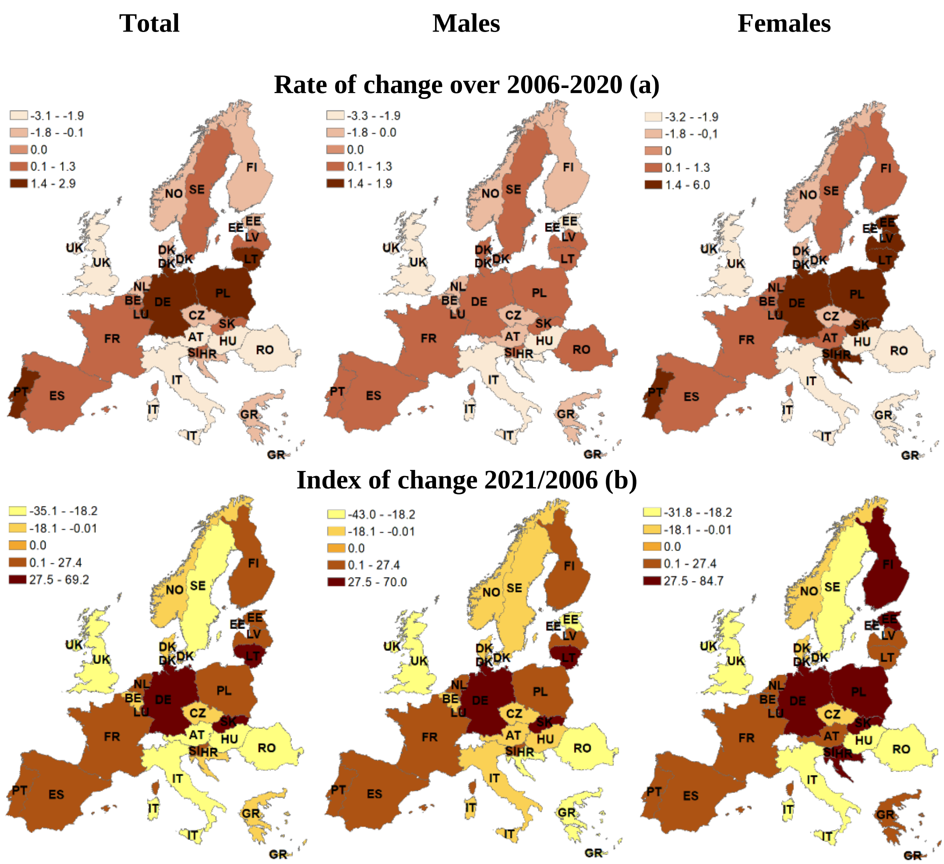

Chart 4. Rate of change (over years 2006–2020) and index of change (in 2021/2006) of SACS in GDP in European countries [in %]

Source: own elaboration in ArcMap 10.8.2.

Discount rate choices in determining health outcomes and costs have important implications for the results of economic evaluations of health interventions and policies. In global health, such evaluations typically use a discount rate of 3% for both health outcomes and costs (Haacker et al., 2020). Suggested values for discount rates vary in European countries and range from 3% – 5% and have important implications for the value of unearned (lost) GDP. The level of discount rates directly affects the value of lost GDP and it is worth noting that not all countries have chosen to introduce them when calculating both costs and benefits in health care. These countries include: Denmark, Greece, Luxembourg and Romania. It is also worth noting that not all countries have chosen to use sensitivity analyses in these analyses. In addition to the countries just mentioned, this group also includes Slovakia, Portugal, Norway, the Netherlands, Lithuania, Latvia, Hungary, Estonia and Finland. In the remaining countries, the minimum and maximum values of discount rates used in the sensitivity analysis ranged from 0% to 10%. The impact of these figures on SACS is presented in Chart 5.

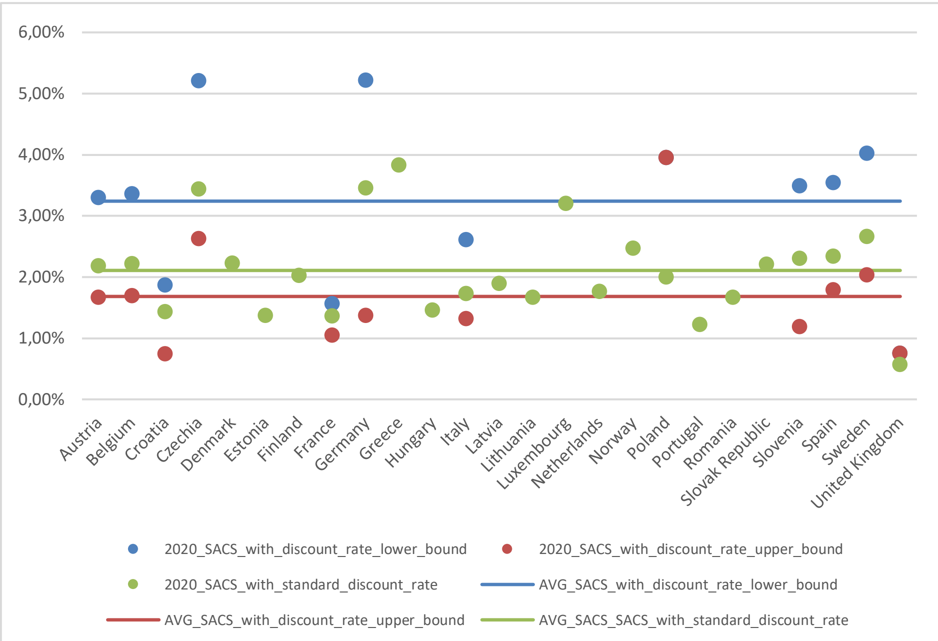

Chart 5. Sensitivity analysis of SACS depending on different discount rate level

Source: own elaboration.

CONCLUSIONS

The aim of the study was to estimate and assess the cost of sickness absence and its contribution to GDP in European countries. The study indicated that there is variation in the cost of sickness absence across European countries, but no clustering relationship was identified from a geographic perspective. In addition, SACS averages 1,68% – 3,24% across all countries in 2006 prices. By contrast, the analysis on an individual basis shows quite a wide variation in the SACS indicator, ranging from 0,57% of GDP in the UK, 1,36% of GDP in France to as much as, 3,8% in Greece. Conversely, a sensitivity analysis of the level of the SACS index to changes in the interest rate shows SACS fluctuations -0,5 p.p. in the upper bound to +1.5 p.p. in the lower bound. It is worth noting that not all countries follow the recommendation to use sensitivity analysis when discounting costs and benefits in health care. Definitely standardising such guidelines would make it easier and, above all, more realistic to carry out comparative analyses in this respect between countries.

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