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# ASSESSING THE ECONOMIC IMPACT OF SICKNESS ABSENCE IN CROATIA BEFORE, DURING, AND AFTER THE COVID-19 CRISIS: EMPHASIS ON THE HOSPITALITY INDUSTRY

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## Abstract

**Purpose.** This study aims to analyze and compare data on sickness absence in the EU and Croatia and to estimate the costs associated with sickness absence in Croatia, with a specific focus on the hospitality industry.

**Design/methodology/approach.** Utilizing the Human Capital Approach (HCA), we quantify the economic impact of sickness absenteeism before, during and after the COVID-19 crisis by calculating the monetary value of lost productivity due to employee absences caused by illness. Additionally, we conducted a comparison of the effects of sickness absence on Gross Value Added (GVA) between the hospitality industry and the overall Croatian economy.

**Findings.** The study found a significant increase in sickness absences and productivity losses due to sickness absenteeism in Croatia from 2018 to 2023, with peaks during the COVID-19 crisis (2020-2022), particularly in the hospitality industry. These results

highlight the need for effective support mechanisms, for both policymakers and organizations, that can be adapted and applied to other sectors, in order to reduce absenteeism and its negative consequences.

**Originality.** This is the first known study of sickness absence that encompasses the extent of this behavior across the periods before, during, and after the COVID-19 crisis at a state level. No previous studies have been found that also focus on the post-COVID-19 period. The findings provide valuable insights for policymakers, and employers aiming to enhance productivity and absenteeism management.

**Keywords:** sickness absence, Croatia, hospitality industry, productivity loss

**JEL Classification:** I18, J22, J24

## Introduction

Absenteeism presents a significant challenge for enterprises and the country as a whole, as it generates high costs. These costs include not only the salary of the absent individual but also the costs of hiring replacement staff or overmanning organizations to account for a specific level of absence, costs associated with lost productivity or reduced quality of services, and many others (Whitaker, 2001). In the tourism and hospitality industry, the impact of absenteeism on overall business operations is particularly pronounced due to its specific characteristics and labor intensity.

According to Johns (1997), there are several types of absenteeism: excused and unexcused, voluntary and involuntary. Primarily, absenteeism is viewed as an absence due to illness (sickness absence, sickness absenteeism), which is a form of excused absenteeism. Some authors expand this definition to include maternity leave (Guertzgen and Hank, 2018) or vacation (Sagie, 1998) as forms of absenteeism as well.

The COVID-19 crisis has caused significant declines in demand and income across many sectors, with the strongest impact observed in the tourism and hospitality industry (Sarıışık et al., 2021). According to the WTTC (2022), prior to the pandemic, travel and tourism was one of the world's largest sectors, accounting for 1 in 4 of all new jobs created in the world, 10.3% of all jobs (333 million), and 10.3% of global GDP (USD 9.6 trillion). In 2020, 62 million jobs were lost due to COVID-19. The tourism and hospitality industry experienced severe losses, amounting to nearly USD 4.9 trillion, with its global contribution to GDP declining by 50.4% year-on-year, compared to a 3.3% decline in the global economy. Other than financial and economic impacts, COVID-19 also affected the hospitality industry operationally, organizationally and technologically (Almeida, Mesquita and Carvalho, 2022).

As a country strongly dependent on the tourism and hospitality, Croatia was also hit hard by the COVID-19. The share of tourism in the overall economy dropped from 19.5%

of GDP in 2019 to 9.6% in 2020, rising again to 19.5% of GDP in 2022, as reported by the Croatian National Bank (2024, 2024a). In 2020, 7.0 million tourist arrivals and 40.8 million overnight stays were recorded, representing a year-on-year decline of 64.2% in tourist arrivals and 55.3% in overnight stays (Croatian Bureau of Statistics, 2020).

Although sickness absence rates in tourism and hospitality industry were relatively lower before the crisis compared to the rest of the economy – particularly when compared to sectors such as public administration, education, and manufacturing, which had the highest levels of sickness absence (Maškarin Ribarić, Derado and Čikeš, 2018) – the COVID-19 crisis led to an increase in sickness absence in this sector too, mirroring trends in the broader economy.

For the purpose of this study, the pre-COVID-19 period encompasses the years 2018 and 2019, the during-COVID-19 period covers 2020 to 2022, and the year 2023 is defined as post-COVID-19. This classification is justified by the fact that many countries had lifted most, if not all, COVID-19 restrictions by 2023, leading to the reopening of economies. Additionally, widespread vaccination and natural immunity had significantly reduced the severity of the disease, further supporting the transition to a post-COVID-19 era.

This study aims to contribute to the literature in several ways. First, by examining changes in the overall absenteeism within the EU and Croatia, comparing pre-, during, and post-COVID-19 patterns. While several studies have compared sickness absences before and during the COVID-19 crisis (Edge et al., 2022; Garbin et al., 2022), to our knowledge, no studies have yet explored the patterns of sickness absences after the pandemic, and this paper aims to fill this gap. Second, no research has been found estimating the costs of sickness absences in Croatia for the periods before, during, and after COVID-19. Similar research was conducted for the period 2010-2016 (Maškarin Ribarić, 2019), and our paper addresses this gap as well. Third, we used the Human Capital Approach to estimate the costs of productivity loss due to sickness absence, introducing two new variables (labor force participation rate and unemployment rate) to minimize the criticism of overestimating productivity costs found in the literature when using this method, thereby contributing methodologically. Fourth, this paper contributes to the overall research about sickness absenteeism and fosters a better understanding of its economic impacts. Finally, our comprehensive data analysis of sickness benefits in the EU, along with the analysis of sickness absenteeism, provides valuable information for both policymakers and employers. This data can be used to design more effective national workplace health policies and interventions and to enhance the management of absence behaviors in organizations.

Taking this all into consideration, the following hypotheses have been proposed:

H1: Absenteeism is a complex phenomenon that affects business operations.

H1a: There are significant differences between sickness absence costs in Croatia before, during, and after the COVID-19 crisis.

H1b: Absenteeism in the hospitality industry is associated with increased operating costs.

H2: There are significant differences between social security models in EU countries regarding sickness benefit schemes.

H3: There are significant differences between sickness absence rates in Croatia before, during, and after the COVID-19 crisis.

H4: There are significant differences in sickness absence rates in Croatia when comparing the hospitality industry to the rest of the economy.

The structure of the paper is as it follows. Section 2 reviews existing literature on absenteeism and its impact on business operations and Section 3 examines the various models of sickness benefit schemes within social security models across European Union countries. Section 4 analyzes trends in absenteeism across EU countries, focusing on the changes before, during, and after the COVID-19 crisis. Section 5 describes the research methodology, while Section 6 presents the study's findings, including the costs of sickness absence in Croatia and the hospitality industry, and compares these costs across different periods. In Section 7, we discussed the results of our paper and reflected on the previous research as well as on the set hypotheses. Section 8 concludes by summarizing the key findings, discussing their implications, and providing recommendations for policymakers, and employers, while also suggesting areas for future research.

## 1. Literature review

Sick leave or sickness absence, in the literature the most commonly used form of absenteeism behavior, refers to the absence from work that is attributed to sickness by the employee and accepted as such by the employer (Whitaker, 2001). Even though it is primarily affected by employee's illness, some other determinants might affect sickness absence, too, such as demographic, attitudinal, health-related, organizational, and job determinants (Čikeš, Maškarić Ribarić and Črnjar, 2018). This unplanned behavior has numerous negative implications for the individuals, enterprises, society and the country in general. Absenteeism increases the workload of present employees (Goodman and Atkin, 1984), impacts the quality of working life (Monkevičius, 2014), lowers their morale (McHugh, 2002), raises the costs (Kocakulah et al., 2016; Navarro and Bass, 2006; Allen, 1983), lowers process quality and output (Morrow et al., 1999) and decreases the organizational productivity (Zhang et al., 2017; Johns, 2011). In the literature, productivity costs mostly refer to the costs associated with production loss and replacement due to illness or disability of paid productive persons (Koopmanschap, Burdorf and Lötters, 2013). Productivity losses related to employee absenteeism have negative business implications for employers, because such losses hinder the ability of firms to generate an expected level of output and profits by depriving the enterprise of an expected level of employee labor (Bankert et al., 2015).

Absenteeism differs among different industries. High rates of absences are mostly found in health and care sector (Krane et al., 2014) and also private sector (Uppal and

LaRochelle-Côté, 2013; Böhm and Riedel, 2013), while the lowest rates are reported in services and especially tourism and hospitality industry (Maškarin Ribarić, Derado and Čikeš, 2018).

Many studies emphasize the use of interventions to manage absenteeism and minimize its negative consequences. These interventions include communication, motivation, health protection (Cucchiella, Gastaldi, and Ranieri, 2014), and specific organizational-level intervention programs (Severin, Svensson, and Akerstrom, 2022), including work-life balance programs, for example. Implementing these strategies is crucial for improving employee well-being, maintaining productivity, and reducing the overall costs associated with absenteeism.

## 2. Overview of sickness benefits in the European Union

Sickness benefits within the context of social security models in the European Union (EU) vary significantly across member states due to different national policies and systems. Depending on the country, social security systems might include the pension insurance, sickness and motherhood insurance, unemployment and health insurance (Jablonskienė, 2013), as well as insurance for cases such as the death of a breadwinner or the need for parental support (van den Heever, 2021). The costs of sickness absence (sickness benefits) are divided between employers and the state, depending on each country's social security system. Overly generous sickness benefits can increase the number of recipients, prolong absence spells, and potentially cause negative long-term dynamic effects (Sjöberg, 2017). Therefore, it is up to individual country policies to adjust their sickness benefit systems to reduce overall sickness absence rates. Table 1 provides a comprehensive overview of the sickness benefits system within the EU countries, detailing the waiting period, continued full payment by the employer, the amount of benefit, and the maximum duration of benefits. Many European countries, such as Cyprus, Estonia, Ireland, Italy, Malta, Portugal, and Spain, implement a waiting period before sickness benefits are paid. In contrast, countries like Austria, Bulgaria, Croatia, Czech Republic, and Germany have no waiting period, allowing employees to receive benefits immediately.

The obligation for employers to continue full payment during the initial period of sickness absence also varies across countries. For example, in Germany, employers are required to pay for the first six weeks of sickness absence, while in Luxembourg, this period averages 13 weeks. This requirement places a financial burden on employers but also ensures that employees do not suffer an immediate loss of income. On the other hand, most of EU countries do not have this requirement and the employers are not obligated to continue paying full wages during the initial sick leave period.

The amount of sickness benefit provided also shows significant variation across countries. Austria, for instance, provides 50-60% of the gross wage, reflecting a balanced approach to maintain a portion of the employee's income while they are unable to work.

Croatia offers 70% of earnings, up to a maximum of €565 per month, ensuring a support but with an upper limit to manage costs. Some countries, such as Portugal, adjust the amount of benefit based on the duration of the sickness period, offering 55% for up to 30 days, 60% between 30 and 90 days, and up to 75% beyond 365 days, thereby providing more substantial support for longer-term illnesses.

The differences in social systems within the EU are also reflected in the maximum duration for receiving sickness benefits. For example, Austria provides benefits for a period ranging from 26 to 78 weeks, offering flexibility for different lengths of illness. In contrast, Bulgaria provides benefits until recovery or the establishment of invalidity. Slovenia and Sweden have no set limitations on the duration of benefits, while Portugal's system allows for up to 1,095 days of benefits, ensuring support for employees with long-term illnesses. On the other hand, countries like Estonia, Poland, and Lithuania have some of the shortest maximum durations for sickness benefits. Estonia and Poland offer benefits for up to 182 calendar days, while Lithuania provides benefits for up to 122 days.

**Table 1.** Sickness benefits across European Union countries

		Sickness benefits			
Country	Waiting period	Continued full payment by the employer	Amount	Maximum duration	
Austria	No	Yes (6-12 weeks)	50% of gross wage or salary, 60% from 43rd day of illness	26-78 weeks	
Belgium	No	Blue collar workers: 7 days; white collar workers: 1 month	60% of earnings	1 year	
Bulgaria	No	No	80% of the average daily gross earnings	Until the recovery or the establishment of invalidity	
Croatia	No	No	70% of earnings (in case of payments by Croatian Health Insurance Fund, maximum €565 per month)	12 months (if the invalidity status has not been established after that period, cash benefits continue until recovery; after 18 months, the benefit is reduced by 50%)	
Cyprus	3 days	No	Ceiling up to three times the Basic Insurable Earnings	156 days (may be extended to 312 days)	
Czech Republic	No	No	Basic Benefit: 60% of the weekly value of the insurance point (increased for dependants); Supplementary Benefit: 50% of the weekly value of the insurance points	380 days (may be extended with an additional 350 days)	
Denmark	No	Depending on the collective agreement	Calculated on the basis of hours of work during the illness and the hourly wage (maximum €611 per week)	26 weeks	
Estonia	3 days	No	70% of the reference wage	182 calendar days	

Finland	9 days	Yes (9 days)	Depending on annual income	300 days (excluding Sundays) over a 2-year period
France	3 days	Depending on the collective agreement	50% of basic daily earnings (maximum €51.70 per day)	360 days per period of 3 consecutive years; up to 36 months in case of long-term sickness
Germany	No	Yes (6 weeks)	70% of the normal salary (maximum €116.38 per day)	78 weeks over a 3-year period
Greece	No	No	50% of the daily wage for the days 4-12; 100% after that	182, 360 or 720 days (depending on the length of the contribution period)
Hungary	No	No	60% of average daily gross earnings (50% in case the employment period is shorter than 2 years)	1 year
Ireland	3 days	No	Maximum of €220 per week + supplements	1 or 2 years (depending on the length of the contribution period)
Italy	3 days	No	50% of earnings until day 20; from the 21st day: 66.66%	180 days per year
Latvia	1 day	No	80% of the average gross wage from the past 12-month period	26 weeks (52 weeks over a 3-year period if incapacity has been repetitive with interruptions)
Lithuania	No	Depending on the collective agreement	62.06% of the average monthly Compensatory Wage	122 days
Luxembourg	No	Yes (13 weeks on average)	100% (the full wage)	78 weeks over a reference period of 104 weeks
Malta	3 days	Yes	Single parent/married person whose partner is not employed on a full-time basis: €23.03 per day; Single person: €14.92 per day	156 days (may be extended to 312 days)



Poland	No	No	80% of reference wage per month calculated on the basis of gross earnings during the last 12 months	182 days
Portugal	3 days	No	55% for up to 30 days; 60% between 30 and 90 days; 70% between 90 and 365 days; 75% beyond 365 days	1,095 days
Romania	No	No	75% of the average insured gross earnings over the last 6 months	183 days per year
Slovakia	No	No	55% of the daily earnings calculated on the basis of the previous year, starting from the 11th day of sickness	52 weeks
Slovenia	No	No	90% of average monthly gross wage in the last year	No limitation
Spain	3 days	No	60% of the regulatory basis for the days 4-20; 75% after that	365 days (may be extended to an additional 180 days)
Sweden	No	No	around 75% of earnings (0.97 of the income, multiplied by 0.80)	No limitation, but the benefit reduces after 364 days
The Netherlands	2 days	No	70% of the wage	104 weeks

*Source: Authors, based on the data from Mutual Information System on Social Protection (2024), Comparative table database (update of 1 July 2023), European Commission, Retrieved June 2, 2024, Available at: <https://www.missoc.org/misoc-database/comparative-tables/>*

### 3. Absenteeism in the European Union countries

The trends of absenteeism in the European Union countries have varied over the last six years. Table 2 provides an overview from 2018 to 2023 of the total absences from work, presented both as the number of people absent from work (in thousands) and as the percentage of absences relative to total employment. These data include absenteeism due to holidays, personal illness, temporary lay-offs, and other reasons. In 2020, France recorded the highest number of people absent from their jobs at 20.6 million, followed by Italy (12.3 million) and Spain (11.8 million). Among the countries with the smallest number of people absent from work were Malta (78,900), Luxembourg (128,600) and Estonia (239,600). The European Union peaked in absences in 2020, with a total of 98.8 million. By 2023, this number had decreased to 78.8 million. Croatia experienced a significant number of absences in 2020 with 931,500, which decreased to 650,600 by 2023. In terms of absences from work as a percentage of employment, France also had the highest rates in 2020 at 19.6%, followed by Cyprus (17.3%) and Slovenia (16.8%). Conversely, the countries with the lowest share of absences in employment in 2020 were Bulgaria (4.2%), Romania (4.8%) and Hungary (6.1%). The overall absence rate for the EU peaked at 13.2% in 2020 and then decreased to 10.1% by 2023. Croatia's absence rate was 14.4% in 2020, decreasing to 10.5% by 2023, aligning with the broader EU trend of post-COVID-19 recovery. These data highlight significant disparities in work absences across EU countries and indicate that while some countries experienced high share of absences in employment and high numbers of people absent from their jobs during peak pandemic years, others maintained relatively low levels (Table 2).

When examining sickness absenteeism only, the comparable data across the entire European Union are limited in both country coverage and time span, and have been reported by Eurostat. As shown in Table 3, in 2020, 16.4 million people at the EU level were absent from their jobs due to illness or disability, representing a 9.3% increase compared to 2016, when 15.0 million people were absent. The countries with the greatest number of sickness absences in 2019 were Germany (4.8 million), France (3.0 million), and Spain (2.1 million), while the smallest numbers were reported by Greece (11,100), Cyprus (14,400), and Luxembourg (18,400). In 2020, France had the highest number of sickness absences with 3.6 million people, followed by Spain (2.7 million) and Poland (1.2 million), whereas Romania (6,600), Cyprus (20,800), and Luxembourg (22,100) reported the smallest numbers. The highest increases in sickness absences among EU member states from 2016 to 2020 were observed in Lithuania (130.6%), Hungary (110.8%), and Greece (87.3%). In Croatia, there was an 18.4% increase in the number of people absent from work due to illness or disability during the same period.

**Table 2.** Absences from work in EU countries (2018-2023)

Year	2018		2019		2020		2021		2022		2023	
	Number of people absent (in 000)	% of total employment	Number of people absent (in 000)	% of total employment	Number of people absent (in 000)	% of total employment	Number of people absent (in 000)	% of total employment	Number of people absent (in 000)	% of total employment	Number of people absent (in 000)	% of total employment
EU 27	72,953.6	9.7	73,472.7	9.6	98,800.9	13.2	78,356.9	10.3	73,522.4	9.5	78,856.6	10.1
Belgium	1,896.7	10.2	1,970.4	10.5	2,778.8	14.9	2,244.6	11.8	2,103.2	10.8	2,220.1	11.4
Bulgaria	311.7	2.6	298.4	2.4	497.3	4.2	386.6	3.3	279.6	2.5	322.0	2.9
Czechia	1,673.5	8.2	1,757.0	8.6	2,339.7	11.6	2,414.1	12.0	2,359.0	11.8	2,424.1	12.5
Denmark	1,238.2	11.9	1,318.0	12.5	1,493.9	14.3	1,330.3	12.5	1,376.5	12.7	1,302.5	11.9
Germany	18,713.5	12.0	18,934.3	12.0	n/a	n/a	14,115.7	9.1	13,228.4	8.3	19,028.9	11.8
Estonia	209.0	8.5	226.1	9.0	239.6	9.8	289.5	11.8	320.3	12.7	313.8	12.2
Ireland	675.8	8.0	660.2	7.6	1,320.6	15.8	1,330.4	15.0	837.8	8.7	837.0	8.5
Greece	589.9	4.0	567.8	3.8	1,928.1	13.8	1,475.2	9.8	821.4	5.1	748.0	4.6
Spain	6,320.8	8.3	6,694.5	8.6	11,867.1	15.9	8,915.5	11.5	9,056.2	11.3	9,312.3	11.3
France	14,972.6	14.2	14,623.4	13.8	20,662.8	19.6	16,778.6	15.7	15,448.2	14.2	14,765.3	13.5
Croatia	622.7	9.7	645.3	9.9	931.5	14.4	717.9	11.0	627.3	9.5	650.6	10.5
Italy	6,590.5	7.5	6,722.1	7.5	12,310.3	14.3	7,443.5	8.6	6,064.8	6.8	5,726.1	6.3
Cyprus	107.6	7.0	113.1	7.1	279.0	17.3	188.5	11.4	168.7	9.8	145.7	8.2
Latvia	225.7	6.5	251.5	7.3	318.3	9.4	302.0	9.3	255.0	7.7	253.6	7.7
Lithuania	328.6	6.3	340.2	6.5	512.4	9.9	403.6	7.8	437.4	8.1	420.5	7.8
Luxembourg	96.1	8.7	97.1	8.6	128.6	11.2	7.5	8.2	95.5	7.8	101.8	8.2
Hungary	691.4	3.8	711.5	3.9	1,097.2	6.1	1,466.4	8.1	1,419.0	7.8	1,402.4	7.7

Malta	n/a	n/a	11.3	1.6	78.9	8.0	83.4	8.2	77.6	7.1	98.4	8.6
Netherlands	3,605.3	11.2	3,488.7	10.7	3,731.0	11.4	3,283.5	9.9	4,041.6	11.9	4,252.4	12.3
Austria	2,055.8	12.5	1,998.2	12.1	2,530.3	15.6	2,042.8	12.5	2,071.5	12.3	1,984.6	11.7
Poland	4,522.4	7.1	4,504.9	6.9	6,304.9	9.7	4,299.7	6.4	3,892.5	5.8	4,013.9	6.0
Portugal	1,650.9	9.1	1,616.2	8.9	2,636.2	14.8	2,331.1	12.8	2,048.8	11.0	1,968.8	10.4
Romania	511.4	1.7	506.2	1.7	1,422.6	4.8	534.7	1.8	605.5	2.0	623.5	2.1
Slovenia	405.7	10.7	427.4	11.2	635.1	16.8	362.1	9.6	391.2	10.3	494.6	12.9
Slovakia	749.0	7.2	691.3	6.6	1,256.1	12.3	1,232.8	12.3	1,113.3	10.9	1,027.6	10.1
Finland	1,274.8	13.5	1,312.2	13.8	1,340.2	14.3	1,452.5	15.2	1,443.8	14.8	1,481.1	15.2
Sweden	2,910.6	15.4	2,984.7	15.8	3,108.3	16.6	2,834.2	15.0	2,938.1	15.2	2,936.9	15.0

Source: Authors, based on the data from Eurostat (2024a), Labor force survey, "Total absences from work by sex and age group - quarterly data.", Retrieved June 1, 2024. Available at: [https://ec.europa.eu/eurostat/databrowser/view/fsi\\_abt\\_q\\$defaultview/default/tablelang=en](https://ec.europa.eu/eurostat/databrowser/view/fsi_abt_q$defaultview/default/tablelang=en), [https://doi.org/10.2908/LFSL\\_ABT\\_Q](https://doi.org/10.2908/LFSL_ABT_Q)

**Table 3.** Absence from work due to illness or disability in EU countries, number of people, in thousands (2016-2020)

	2016	2017	2018	2019	2020
EU 27 (average)	558.7	572.5	595.4	596.3	610.6
Belgium	540.5	538.3	581.4	607.7	640.9
Bulgaria	37.9	40.0	40.4	34.8	52.7
Czechia	378.7	412.4	423.3	429.9	519.3
Denmark	175.7	176.5	164.2	187.8	196.6
Germany	4,589.7	4,812.0	4,937.4	4,896.3	n/a
Estonia	29.3	32.4	34.1	36.9	42.4
Ireland	87.3	101.5	116.7	121.5	128.5
Greece	11.8	11.2	20.0	11.1	22.1
Spain	1,662.2	1,793.6	1,959.5	2,101.1	2,756.6
France	2,921.1	2,929.4	3,035.9	3,024.6	3,602.6
Croatia	133.8	146.8	157.3	163.2	158.4
Italy	982.2	909.2	776.3	649.4	664.1
Cyprus	12.6	13.7	17.6	14.4	20.8
Latvia	47.7	45.1	41.8	66.2	67.7
Lithuania	31.7	36.2	45.6	51.3	73.1
Luxembourg	14.6	16.0	18.5	18.4	22.1
Hungary	96.2	94.0	123.3	131.8	202.8
Malta	n/a	n/a	n/a	n/a	n/a
Netherlands	575.5	573.4	627.3	601.7	633.7
Austria	283.4	291.5	344.2	334.3	350.9
Poland	988.0	1,013.7	1,074.9	1,086.1	1,270.3
Portugal	524.1	539.1	592.5	580.4	676.2
Romania	n/a	n/a	n/a	n/a	6.6
Slovenia	96.3	98.1	110.5	114.4	120.8
Slovakia	147.6	149.0	157.6	132.1	212.8
Finland	211.1	211.6	227.6	217.4	221.7
Sweden	480.8	457.8	453.6	442.6	551.0

Source: Authors, based on the data from Eurostat (2024), Labor force survey, "Absence from work by main reason, sex and age group (2006-2020)- quarterly data", Retrieved June 2, 2024, Available at: [https://ec.europa.eu/eurostat/databrowser/view/lfsi\\_abs\\_q\\_h\\$defaultview/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/lfsi_abs_q_h$defaultview/default/table?lang=en), [https://doi.org/10.2908/LFSI\\_ABS\\_Q\\_H](https://doi.org/10.2908/LFSI_ABS_Q_H)

Data on sick leaves in Croatia are collected and published by the Croatian Health Insurance Fund (CHIF). For the first 42 days of sick leave (short-term sick leaves), employers cover the sick pay, while CHIF covers sick leaves longer than 42 days (long-term sick leaves). From 2018 to 2023, the average number of sick days per employee varied, peaking at 16.34 days in 2020 before decreasing to 13.58 days in 2023 (Table 4). Sick days covered by employers decreased from 9.73 days in 2020 to 8.14 days in 2023, while those covered by CHIF dropped from 38.44 days in 2018 to 29.40 days in 2021 before rising to 33.28 days in 2023. This indicates that while the overall sick days showed a recovery post-pandemic, the burden of long-term sick leave shifted, but remained significant for CHIF.

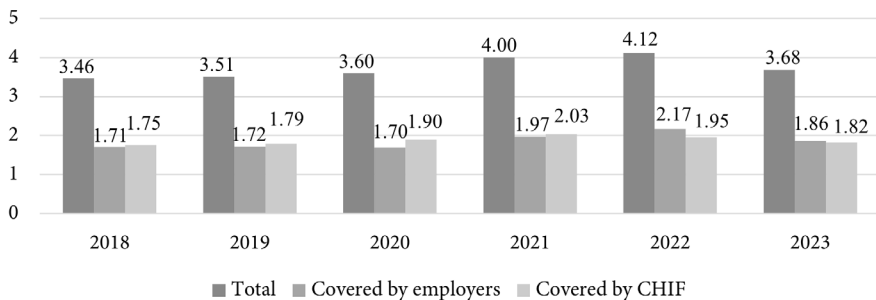
**Table 4.** Average number of sick days per year per employee in Croatia

	2018	2019	2020	2021	2022	2023
Total	15.40	15.40	16.34	15.32	13.23	13.58
Covered by employers	8.93	8.90	9.73	9.61	8.39	8.14
Covered by CHIF	38.44	37.70	33.26	29.40	29.49	33.28

Source: Authors, based on the data from Croatian Health Insurance Fund (2024), Annual reports 2018-2023, Retrieved June 1, 2024, Available at: <https://hzzo.hr/o-nama/izvjesca>

Between 2018 and 2022, the rates of temporary incapacity for work increased, both overall (from 3.46% to 4.12%) and for short-term sick leave periods (from 1.17% to 2.17%), as shown in Chart 1. The rates for long-term sick leave periods grew from 2018 to 2021 (from 1.75% to 2.03%) before starting to decline. In 2023, the rates decreased further, reaching 1.82%, which is lower than the rate at the beginning of COVID-19. Comparing the rates of temporary incapacity for work covered by employers and CHIF in 2022 and 2023, a greater share in total absences fell on employers then in previous years, increasing their burden.

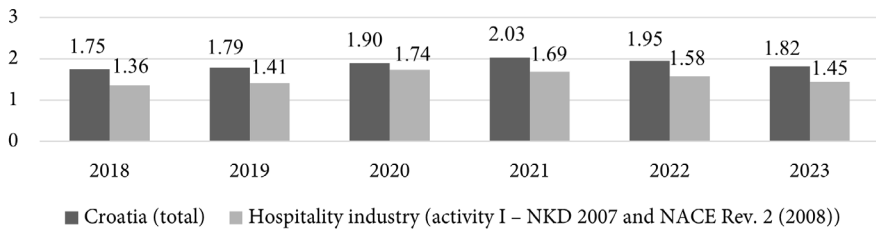
**Chart 1.** Rates of temporary incapacity for work in Croatia (the ratio of the number of daily sick people and the number of active insured persons)



Source: Authors, based on the data from Croatian Health Insurance Fund (2024), Annual reports 2018-2023, Retrieved June 1, 2024, Available at: <https://hzzo.hr/o-nama/izvjesca>

When observing hospitality industry (activity I – Accommodation and food service activities, Croatian National Classification of Activities – NKD 2007 and NACE Rev. 2 (2008).) in comparison to the average of the whole economy, it is evident that the rates of temporary incapacity for work (sick leaves covered by CHIF) in this sector are consistently lower throughout the observed period (2018-2023). The rates started at 1.36% in 2018, peaked at 1.74% in 2020, and then dropped to 1.45% in 2023 (Chart 2).

**Chart 2.** Rates of temporary incapacity for work covered by CHIF in the Croatian economy and hospitality industry (activity I – NKD 2007 and NACE Rev. 2 (2008))



Source: Authors, based on the data from Croatian Health Insurance Fund (2024), Annual reports 2018-2023, Retrieved June 1, 2024, Available at: <https://hzzo.hr/o-nama/izvjesca>

These results align with previous research, indicating that, compared to other sectors, the tourism and hospitality industry has among the lowest absence rates.

#### 4. Methodology

In order to estimate the costs of sickness absence, i.e., loss of productivity, researchers suggest two approaches – Human Capital Approach (HCA) and Friction Cost Method (FCM). The Human Capital Approach values total production lost due to illness, disability, or premature death by calculating the total period of absence (or disability or from death until the retirement age) and subsequently multiplying this by the wage rate (or an average expected wage rate for the relevant period) of the absent worker (Koopmanschap, Burdorf and Lötters, 2013). Some experts argue that the HCA overstates productivity losses and propose use of the FCM that estimates societal productivity loss as the short-term costs incurred by employers in replacing a lost worker (Pike and Grosse, 2018). To assess lost productivity using this approach, the friction period – the time required to replace the work – must be determined, which depends on the unemployment level and the efficiency of finding a replacement. Since these factors vary by activity and work type, the friction period is specific to circumstances and changes constantly (Maškarin Ribarić, 2019).

In this paper, the Human Capital Approach will be used. The loss of productivity was calculated by multiplying the time lost due to sickness absence by the market value of work (gross salary). The obtained amount was then adjusted for labor force participation and

unemployment rates to ensure that productivity losses more accurately reflect the real state, as presented in the following formula:

$$\text{productivity loss} = \frac{(t \times g \times 8) \times (p \div 100) \times ((100 - u) \div 100)}{\text{GVA}} \times 100$$

where:

- t – time lost due to sickness absence (days of temporary incapacity for work),
- g – average monthly gross earning per paid hour,
- p – labor force participation rate,
- u – unemployment rate,
- GVA – gross value added.

Similar approach was also used in other researches (Maškarin Ribarić, 2019). Days of temporary incapacity for work (absence from work due to illness or injury) were obtained from the Croatian Health Insurance Fund's annual reports for the years 2018-2023 (2024). Data on the average monthly gross earning per paid hour were obtained from the Croatian Bureau of Statistics (CBS) (2024). Labor force participation data were downloaded from the World Bank (2024), and unemployment rate data were sourced from Eurostat (2024b). Gross value added (GVA) was used as a productivity measure, as seen in previous studies (Łyszczarz and Nojszewska, 2017). Data for the years 2018-2022 were obtained from the CBS (2024a), while data for 2023 were provided directly by CBS and represent the sum of the quarterly estimates for that year.

## 5. Results

In the period 2018-2023, the average monthly gross earning per paid hour increased by nearly one-third, reaching 9 EUR in 2023 (in current prices), as presented in Table 5. Meanwhile, the unemployment rate decreased by 2.4%, dropping from 8.5% in 2018 to 6.1% in 2023, which is also the lowest rate in the observed period. From 2018 to 2023, the loss of productivity increased by 71.1%. Prior to the COVID-19 crisis, the loss of productivity accounted for 412 million EUR in 2018 (0.96% of GVA) and 452 million EUR in 2019 (1.00% of GVA). During the COVID-19 crisis, these rates peaked, with productivity loss of 1.68 billion EUR in the years 2020-2022. The highest productivity loss is visible in 2023, counting for 704.9 million EUR, which is 1.11% of GVA, as shown in Table 5.



**Table 5.** Loss of productivity due to sickness absence in Croatia, HCA method

	Days of temporary incapacity for work	Average monthly gross earning per paid hour (in current prices, EUR)	Labor force participation (%)	Unemployment rate (%)	Loss of productivity (in current prices, EUR)	GVA (in current prices, EUR)	Productivity loss in GVA (%)
2018	16,942,139	6.49	51.19	8.5	412,011,320	42,816,706,261	0.96
2019	17,566,616	6.74	51.10	6.6	452,070,083	45,117,833,198	1.00
2020	17,812,140	6.92	51.03	7.5	465,456,910	42,195,913,272	1.10
2021	20,166,464	7.23	51.78	7.6	558,074,343	48,298,122,882	1.16
2022	21,658,752	7.85	52.30	7.0	661,572,904	57,037,269,148	1.16
2023	19,811,999	9.00	52.63	6.1	704,952,339	63,437,372,700	1.11

Source: Authors' research

To estimate the costs of time lost due to sickness absence in the hospitality industry before, during, and after the COVID-19 crisis, the following calculations are used:

$$\text{sickness costs (economy)} = \frac{(t_e \times g_e)}{GVA_e} \times 100$$

$$\text{sickness costs (hospitality industry)} = \frac{(t_t \times g_t)}{GVA_t} \times 100$$

where:

$t_e$  – time lost due to sickness absence (days of temporary incapacity for work) – Croatia,

$t_t$  – time lost due to sickness absence (days of temporary incapacity for work) – hospitality industry (NKD “I”),

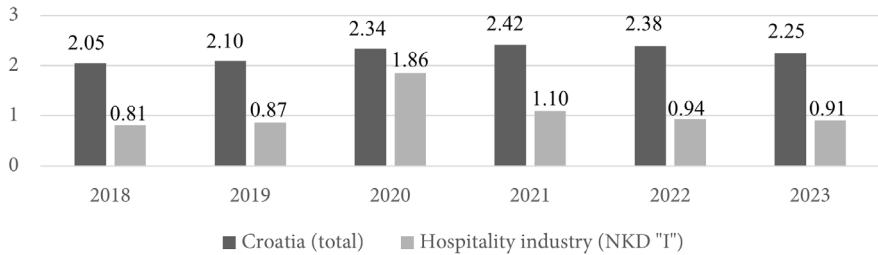
$g_e$  – average monthly gross earning per paid hour – Croatia,

$g_t$  – average monthly gross earning per paid hour – hospitality industry (NKD “I”),

$GVA_e$  – gross value added – Croatia,

$GVA_t$  – gross value added – hospitality industry (NKD “I”).

The total number of days of temporary incapacity for work is multiplied by the average monthly gross earning per paid hour, separately for the entire Croatian economy and for the hospitality industry alone. Subsequently, the cost of time lost due to sickness absence is expressed as a percentage of the gross value added (GVA) for Croatia as a whole and for the hospitality industry specifically (Chart 3).

**Chart 3.** The cost of time lost due to sickness absence in Croatia (% of GVA)

Source: Authors' research

The share of the cost of time lost due to sickness absence in GVA ranges from 2.05% in 2018 to 2.25% in 2023 when observing the total economy (Chart 3). In the hospitality industry, these shares are much lower, ranging from 0.81% in 2018 to 0.91% in 2023. In 2020, the share of the cost of time lost in GVA for hospitality industry was the highest in the observed period, reaching 1.86%. For the entire economy, the highest rate was achieved in 2021, accounting for 2.42%. Although these results indicate that Croatian hospitality industry generally performs better than the overall economy, the data also confirm the industry's dependence on external factors such as the COVID-19 crisis. However, lower share of the costs of time lost in GVA in the hospitality industry, in comparison to the overall economy, are the also the result of lower average monthly gross earning per paid hour and lower number of days of temporary incapacity for work (i.e., lower sick leave rate).

## 6. Discussion

Absenteeism, particularly sickness absence, has numerous negative implications for individuals, enterprises, society, and the country, including increased workload for present employees, lowered morale, raised costs, reduced process quality and output, and decreased organizational productivity. These impacts are intensified during periods of crisis, as evidenced by the significant changes in productivity costs due to sickness absence in Croatia before, during, and after the COVID-19 crisis. Productivity losses observed within the hospitality industry were also significant, but with somewhat better image than the rest of the economy. These findings support the hypothesis *H1*, as well as the sub-hypotheses *H1a* and *H1b*. High absenteeism costs and productivity losses during COVID-19 were also reported in previous studies (Famararzi et. al, 2021; Yang et. al, 2023).

The hypothesis that there are significant differences between social security models in EU countries regarding sickness benefit schemes (*H2*) is also strongly supported by the data. The analysis reveals considerable variation in waiting periods, employer obligations for continued payment, the amount of benefit provided, and the maximum duration of

benefits across member states. These differences highlight the diverse approaches to managing sickness absence, reflecting each country's unique policy priorities. Previous comparative analysis of sickness benefits within the European Union also found great differences among the countries (Spasova, Bouget and Vanhercke, 2016; Chaupain-Guillot and Guillot, 2017).

Fluctuations in sickness absence over the periods before, during, and after the COVID-19 crisis support the hypothesis *H3*. The average number of sick days per employee peaked in 2020 at 16.34 days, reflecting the immediate impact of the pandemic on health and work attendance, before decreasing to 13.58 days by 2023. These findings align with the broader European trends supported by previous analyses of sickness absence before and during the COVID-19 crisis (Edge et al., 2022; Garbin et al., 2022).

The data indicate significant differences in sick leave rates between the hospitality industry and the rest of the economy in Croatia, supporting *H4*. From 2018 to 2023, the hospitality sector consistently had lower rates of temporary disability compared to the general economy, with a peak of 1.74% in 2020 falling to 1.45% in 2023. In contrast, the general economy saw an increase in temporary disability rates, reaching 4.12% in 2022. This is also supported by previous research on this matter (Maškarić Ribarić, Derado and Čikeš, 2018).

## Conclusion

This study provides a comprehensive analysis of sickness absenteeism and its economic implications, particularly focusing on the hospitality industry in Croatia and the broader European Union. The findings reveal that from 2018 to 2023, both sickness absences and productivity losses due to sickness absenteeism in Croatia increased significantly, across the entire economy and within the hospitality industry specifically. The peaks of sickness absences and productivity losses occurred during the COVID-19 crisis, particularly in the years 2020-2022. The study also reveals considerable variation in sickness benefit schemes across European Union countries, reflected in the distribution of costs between employers and social security systems.

Theoretical, empirical and practical implications. This analysis contributes significantly to sickness absenteeism research by offering a comprehensive exploration of its diverse impacts on business operations and national economies. By providing new insights and empirical evidence, this study enhances the existing literature and expands the understanding of absenteeism phenomena. Further, this study provides empirical evidence supporting the existence of significant differences in sickness absence rates and costs between the hospitality industry and the broader economy. Lower sickness rates and costs in the hospitality industry can have practical implications for policymakers and organizations, indicating potential areas for targeted support mechanisms that can be adapted and applied to other sectors to reduce absenteeism. Such mechanisms might include clear absence management policies, improved working conditions, work-life balance initiatives, wellness and

incentive programs, as well as flexible work arrangements like flexible working hours and remote work options. These strategies can help optimize human resource management and enhance overall organizational performance. In this study, the Human Capital Approach was used to estimate the costs of sickness absence. Moreover, the labor force participation rate and unemployment rate were introduced in the equation, addressing the criticisms of overestimation in traditional productivity cost assessments and providing a more accurate reflection of absenteeism's economic impacts. Finally, the differences in social security models and sickness benefit schemes across EU countries, reflected in the diverse policy priorities and approaches to managing sickness absence, can provide a valuable comparative framework for policymakers. Elements of the most effective social security models and best practices could be implemented in EU countries with the highest absenteeism rates. Additionally, to facilitate better comparisons and improve monitoring systems, standardized methods for measuring, collecting, and expressing sickness absence data – including rates, causes, and costs – could be developed. By considering these suggestions, policymakers can help create more efficient social security systems that balance the needs of both employees and employers.

Limitations and future directions. This study has several limitations. First, this study was conducted in Croatia, and when comparing these results with other countries, it is important to consider differences in economic structures, healthcare systems, and labor market conditions. Second, the strategies to prevent the spread of the pandemic differed significantly in EU countries and their influence on the data on sick leave is certainly present and significant, but was not analyzed in this paper. Future studies might explore this relation. Third, while the study covers the period from 2018 to 2023, it may not capture long-term trends or the full impact of the COVID-19 crisis, especially as the post-pandemic period continues. Future studies might explore the long-term effects of post-pandemic absenteeism. Fourth, we focused on the hospitality industry in order to emphasize the importance of managing this undesirable employee behavior within one of the greatest generators of Croatian economy. The costs of absenteeism in other sectors, or some other aspects of absenteeism behavior might be explored in future studies, too. Finally, future researches might focus on different aspects of work during COVID-19 crisis and its effects on sickness absence rates, such as hybrid and remote working models.

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